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Risk Management: Partnering for Prosperity

Amy Cronin

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NUFFIELD CANADA

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SCHOLAR PROFILE

Amy Cronin is a mother of six children, a hog, chicken and cash-crop producer, and a business owner in Huron County, Ontario. She, and her husband Mike, farm in Ontario, Iowa and Missouri and thrive on creating sustainable and innovative business plans that enable them to work with their team toward their vision: “Progressive, Prosperous, Best-In-Class”. Amy is actively involved at both the provincial and national levels. She is the chair of the Ontario Farm Products Marketing Commission, and Chair for the Vaccine and Infectious Disease Organization at the University of Saskatchewan. In addition, she is chair of the Ontario Outstanding Young Farmers program and Vice Chair of Canada’s Outstanding Young Farmer Program.

Her leadership includes an eight-year contribution to the Ontario Pork Board of Directors, four years with Swine Health Ontario, and co-chair of the Premiers Agricultural Growth Steering Committee in 2016. With a desire to contribute to her community, Amy is actively involved in her parish community and serves as Vice Chair of the board of trustees for the Huron-Perth Catholic District School Board. She is a graduate of three leadership programs: Advanced Agricultural Leadership Program, Canadian Total Excellence in Agricultural Management, and the Executive Program for Agricultural Producers.

Amy’s commitment to family, faith, farm life and industry fuels her passion for having an impact and making the world a better place for the next generation.

ACKNOWLEDGMENTS

It is with a grateful heart that I express my deep appreciation for the many supports I was given in order to complete my Nuffield Scholarship.

First and foremost, to my husband and dearest friend, Mike. Your unwavering love, selflessness and cheerleading have given me the courage I needed to apply for a Nuffield scholarship and embark on adventures that I never thought would be possible with a large family, a farm to take care of, and my many industry commitments.

Our family is our greatest asset, and that core value rang especially true in the past couple of years as our children willingly stepped up in their responsibilities to allow me to travel extensively to explore agriculture, agri-food and government policy around the world. Alyssa and Aidan, Tyler, Kyle and Maria, Liam, Emmy and Sam, the bond that you all share is enviable by many. I admire your love of family and am forever grateful for the many ways in which you looked after each other, our farm, and our team while I, and often dad too, were away. It is the passion for agriculture that you show that drives our desire to make our farm and industry an excellent place to be in the future.

It takes a community to raise a child and, in my case, six of them. To the generous and thoughtful family and friends who provided meals, were on call for support when needed, checked in regularly to ensure everyone was OK, and went out of their way in even the smallest of ways to ensure that our children were thriving while I was away. Thank you from the bottom of my heart.

To all the incredible people who welcomed me around their kitchen tables, into their pick-up trucks for a farm tour, to the boardroom table for discussions and who offered a place to rest my head after long days of travel, thank you. Your insight and stories made this paper authentic, fascinating, and valuable to me and others. The hospitality of both friends and strangers worldwide will not be forgotten.

A very special thanks goes out to my primary sponsor, Grain Farmers of Ontario. As an Ontario farmer, I have great appreciation for our agricultural organizations and know the challenge of providing value for dollar to your farmer members. It is my goal to add value to their bottom line through my research on risk management. Thank you for your trust in me to accomplish this work.

To all my sponsors, I am indebted to your generosity and support over the past few years. Not everyone said yes when I reached out for sponsorship. For those of you who did, I know you understand the challenges that farmers face and want to help them find success. I appreciate your patience and understanding as I worked to overcome barriers in completing a Nuffield scholarship during a global pandemic. I am confident that each challenge contributed to a better product overall. Risk management is more important than ever.

SPONSORSHIP

My Nuffield Scholarship was sponsored by Nuffield Canada Alumni and:

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EXECUTIVE SUMMARY

Risk is inevitable in agriculture. The decision to participate in risk is made the moment we decide to farm. How primary producers identify and manage risk has a cascading effect across the entire industry, affecting investors, supporters, and legislators. This report draws from interviews with farmers from 11 different countries across four continents, which were conducted in the midst of a global pandemic, war in Eastern Europe, battles over energy sources, rampant inflation, and a myriad of other crises. As such, it has a unique vantage point from which to identify common risks, and compare various mitigation strategies at local, national, and global scales.

By tapping into the knowledge and expertise of leaders in business risk management, stress psychology, and financial strategy, the practical case studies in this report (focusing on both local and government-level risk management) enable readers to gain a broader perspective of how risk is understood and handled in agriculture. The mission to create stability and security on the farm, must become a universal call to all stakeholders to create stability and security in a world of intertwined global food supply. Farmers constantly face both internal (originating on the farm) and external (originating outside the farm) risks, which present themselves in three ways,

- Preventable risks: events largely within a farmer's control which can be mitigated through proactive measures and require a compliance-based approach,
- Strategic risks: can present opportunities but may also impede the attainment of a company's objectives. They are trackable enough to strategize around and have a degree of predictability that allows for more choice in whether to engage or not, and,
- External risks: events that are entirely outside a farmer's control (and often line of sight) that have the potential to seriously harm the business.

Despite the messaging that written risk management plans are a good business tool to have on hand, and despite the resources available to create them, farmers around the world rarely have one. It is the external risks that are often dismissed, not because they are unimportant, but because they are outside of a farmer's control and are therefore deeply uncomfortable to think and talk about. Yet, it is crucial to find a trustworthy group, primarily comprised of fellow farmers, to talk through potential risks and overcome the fears associated with external risks. While farmers are primarily responsible for thinking about and managing risk, government and industry also have a role to play.

This can be done well, but in this report, we also see examples around the world in countries such as Denmark, the Netherlands, and Zimbabwe, where government got ahead of (or even worked against) the people. Ultimately, only a stable government can help farmers and industry to manage risk. It is, and will continue to be, essential for farmers and government legislators to work together, because only then can we ensure sustainable solutions. This report focuses on how we can create communities throughout the agriculture industry which can identify and proactively manage external and global risks that threaten farming around the world. Having a comprehensive approach to educate and support farmers on risk management is essential to ensure that, from the grassroots to the global level, there is dialogue and collaboration which aims to ensure sustainability on the farm: for people, planet, and profit.

DISCLAIMER

This report is longer than the average Nuffield report. With so many incredible interviews and visits, I was only able to scratch the surface but wanted to give the reader the opportunity to read it in it's entirety or in parts. The table of contents will help you to navigate to specific points of interest throughout the document. The heart of my findings can be found in the both 3.5, Local Risk Management Analysis: Tying it All Together on page 39 and in 4.5, Government Risk Management: Tying it All Together on page 76.

It has been prepared in good faith but is not intended to be a scientific study or an academic paper. It is a collection of my current thoughts and findings on discussions, research and visits undertaken during my Nuffield Farming Scholarship.

This report illustrates my thought process and my quest for improvements to my knowledge base. It is not a manual with step-by-step instructions to implement procedures.

Neither The Nuffield Farming Scholarships Trust, nor my sponsor, nor any other sponsoring body guarantees or warrants the accuracy, reliability, completeness or currency of the information in this publication or its usefulness in achieving any purpose.

Readers are responsible for assessing the relevance and accuracy of the content of this publication.

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1.0 INTRODUCTION

As farmers, we know risk. Good farmers may not have a written business risk management plan, but most often we successfully account for the kinds of risks that are controllable, preventable, and rules-based. We pay our insurance, keep written protocols, have a succession plan, and write down the rules so employees can follow them. Good farmers have these kinds of risks under control. Things still go wrong, but we do our best.

We also have risk management tools that serve us well: the five pillars of risk management (Figure 1), production and income diversification, private insurance, and hedging tools. Here in Canada, Farm Management Canada has a resource manual, *A Comprehensive Guide to Managing Risk in Agriculture*, and they created AgriShield, an online platform for managing risk. These are a wonderful set of resources. Nevertheless, the reality of farming is that we're also juggling so many things, while wearing so many hats. Farmers are extraordinarily busy. Today on our farm, we are (in addition to our regular daily activities and caring for livestock) spraying for fusarium, managing the logistics of pig movements, cleaning out chicken barns, meeting with our insurance provider, and getting the lawn mowed at the farm. That's only one day. Farmers care a lot about managing the risks that come with farming but taking even a day to sit down and read a giant resource, no matter how wonderful, is never going to make it to the top of many farmers' lists.

Risk and risk management are inescapable elements of farming. Different kinds of risk require different approaches: there are 'external' risks, which can't be prevented and are beyond our control but still have to be managed, and there are also 'strategic' risks that we take to move our business forward. Then there are the 'preventable' risks. Before COVID-19, if you had asked me about risk, my first thought would have been about the kind I could prevent, write a protocol to mitigate, or at least wrap my head around. Risk management was something I could tie with a neat and tidy bow. Then, in 2018, China suddenly contracted African Swine Fever (ASF) in their swine herds and as a hog producer, my perspective changed. And then, there was a global pandemic. Then, a war between Russia and Ukraine. Energy prices skyrocketed overnight, inputs and supplies were either inaccessible or had soared in price. These events were unforeseen, constantly changing, and left me wondering "How do you plan for events you can't even see coming?"

With that question in mind, I began my Nuffield Scholarship. Smart, innovative, and inspiring farmers, industry experts, and government representatives from 11 countries on four continents, shared with me their many different perspectives on risk and their own experiences with external risks: environmental policies (in the EU), agricultural dependency on Russia and Ukraine, wildfires and droughts (in Australia). My experiences, farming, traveling and learning from other farmers during a time of global upheaval taught me that if we are going to thrive in a world of global disruption, we as farmers need to understand strategic and external risks.

Even exceptional farmers have a hard time taking these risks into account: they are too complicated, they change too quickly, and they are too big to think about. We are being impacted by forces that we don't have time to try and understand, and yet they are huge forces in our lives, on our farms, and on everyone's kitchen tables. They can feel so overwhelming that they become unthinkable.

In the past few years, I have realized that, when it comes to risk, things happen that are completely beyond our control and often beyond our imagination. We haven't accounted for these risks in a risk management plan. Even the best of the best don't account for global disruptions. As farmers, we are no longer local businesses. We are so much more interconnected than we realized. A wave of events in China, or the EU, can drastically change things in our own backyard. We can't avoid the waves, but we can learn how to ride them. So, what does it take for farmers to learn how to surf? How do we create a way for farmers to think about external and strategic risks in a way that doesn't feel completely overwhelming?

Personally, I sometimes struggle listening to an "expert" telling me what I should do on my farm. Experts, although they have a lot to offer, often operate in silos. Many don't have skin in the game. Ultimately, if something happens on my farm, it's up to me to deal with it. We have different mentalities and mindsets, so the solution can't come only from academics or experts talking to farmers.

It needs to be farmers talking with other farmers. We can empathize and support each other in a way that non-farmers can't. We are able to share trials and tribulations, approaches to solutions and gain confidence in decision making while doing it. Even if we feel stuck, the first step may be realizing that we are all stuck here together, living in this tension. For me, I realized that I had to start by recognizing how difficult and painful — I mean, 'fetal-position, on-the-floor' painful — it was to think about the possibility of African Swine Fever on my farm. Nothing will send me into a mental tailspin faster than thinking about having to humanely euthanize all my animals, figure out how to safely dispose of them, and then dealing with all income screeching to a halt for months or years to come, knowing that government doesn't have a plan in place either.

It was in meeting and talking with other farmers who had faced that level of devastating external risk that allowed me to imagine a way through the unimaginable. Through our discussions, sharing thoughts and ideas, and then thinking about how to adapt their ideas to my own situation, I was better able to consider and plan for the unimaginable risks. You see, many times it takes having discussions about external risk in general to change our mindset, to realize that our fears are unfounded, and to help us better position ourselves to cope, or even thrive, when situations arise.

We need to think differently about risk management and learn how to incorporate these global disruptors into our understanding, our conversations, and our practice. We can learn how to think out-of-the-box together. Risk management often goes beyond the farm gate, and this means that industry and government also have important collaborative roles to play, with

openness and transparency. They play a role in fostering understanding, ensuring that solutions are practical, that communication is strong, and that the decision-making process is inclusive, in an effort to find an outcome that works for all. What we are facing doesn't fit into a traditional business risk management framework. We can learn to ride the waves, but first we need to challenge our inner reluctance to avoid thinking about these extremely uncomfortable risks. As Glennon Doyle says, we do hard things every day – we can do this hard thing too.

Research Questions

1. Can governments and the agricultural sector work together to achieve global and national commitments and ensure farm success?
2. How do farmers innovate and mitigate risk to future-proof?
3. Can government policies and programs simultaneously support global and national priorities while supporting farm success?

2.0 WHAT IS RISK MANAGEMENT?

2.1 General Overview of Concepts in Risk Management

In a Harvard Business Review article published in 2012, Robert Kaplan and Anette Mikes question conventional "rules-based risk management" approach by breaking risk into three categories: preventable risks, strategic risks, and external risks. As farmers, we are always thinking about risks that fall under the 'preventable' category and we often give consideration to the strategic risks (although we may not categorize them in quite the same way or analyse them as deeply as we should), but when it comes to external risks, there is a gap in addressing risks that are unpreventable. As Kaplan and Mikes (2012) describe in their article, many businesses find themselves in this gap and struggle to effectively manage risks that arise outside the organization or its strategies. Yet, it is these very risks that pose some of the most serious threats and can stifle or even ruin a business.

Understanding the complexities of business risk management is important because it is an important aspect of management skills in general, which, in turn, can enhance a farmer's open marketing abilities and sustain profitability and competitiveness. Dr. Danny Klinefelter is the founder of Texas A&M's The Executive Program for Agricultural Producers (TEPAP) program, which I attended in January 2023 for the benefit of my own business and as part of my research into risk management. Klinefelter defined the reality of functioning on the open market, without income support programs, and its impact on the 'average producer', saying:

> The function of a competitive market is to drive the economic return to the average producer to breakeven, through supply and demand responses in both input and output markets. In market equilibrium the top end farmers are profitable and growing, the average is hanging in there, and the bottom end are losing money and exiting the industry.

> Therefore, business success and survival depend on continuous improvement – at a pace necessary to stay in the front half of the pack (Klinefelter, 2023).

The TEPAP program is built on seven principles, one of which is that when the rate of change inside an organization becomes slower than the rate of change outside, its end is in sight. The only question is when (Welch, 2023). Learning how to maintain continuous improvement means learning to run with change, and in a rapidly changing world with constantly shifting external risks, this task requires keeping on top of the research in risk management. This is not an easy task, especially in the busy world of agriculture, but it is increasingly important.

2.2 Risks and Risk Management in Agriculture

Risk management in agriculture is critical to ensuring the sustainability and success of farming operations. Farmers face a myriad of uncertainties that can impact their yields, production, incomes, and livelihoods. Farmers all over the world share a common understanding of the inherent uncertainties of agriculture, and they know all too well how these uncertainties can have significant effects on farm income. The way in which a farmer deals with the uncertainties they face can be the difference between surviving and thriving. Over the past couple of years, I have observed and interacted with farmers, agribusinesses, and government entities in 11 countries on four continents, and through this process, a nuanced understanding of risk management has emerged. This understanding starts by referring to the systematic process of identifying, assessing, mitigating, and adapting to various uncertainties and potential hazards that can impact agricultural operations, productivity, and outcomes.

For years, farm groups and the government have given considerable thought to this process of risk management. This has led to an imperative to create written risk management plans which are most often done with what Kaplan and Mikes describe as a mindset of "compliance" (2012) or a rules-based approach. I talked to many successful farmers in different commodities, countries, and climates. Most had thought

RISK CONTEXTS

According to the work of Kahneman and Tversky (1979), people make decisions in risk management according to what they stand to lose, not what they stand to gain.

However, losses and gains are not universal. For one person, a 'loss' may mean a loss of an investment, for someone else a 'loss' may mean a loss of life. The psychology of how people make decisions may be universal, but they make decisions based on their own risk context. This can include their country's government and laws, the political climate, their family structure, insurance coverage, access to subsidies, personal values, etc.

Different risk contexts mean different decisions. What makes sense in your risk context could be foolish in another risk context. This can be important to keep in mind when thinking about risk management across countries and cultures.

about potential risks to their farm operation and had management well under control. However, most also did not have a written plan. When asked why, there were a few common thoughts that surfaced. Generally speaking, farmers believe in risk management, but they struggle with the risks they can't see. Time was also an issue for almost all the farmers I spoke to. Something always took precedence over getting things on paper. Others referred to risk management plans that had been written and set on a shelf, only to collect dust. They told me time and again that it 'just wasn't worth it' and 'things change too rapidly'.

Even if we know it is important and we have the resources available to get through the basics of risk management, why don't a higher percentage of farmers go through the process of having a business risk management plan? As Gary Cohn, Vice Chairman of IBM says, "If you don't invest in risk management, it doesn't matter what business you're in, it's a risky business." Through these conversations, I discovered that farmers use systematic, rules-based processes to manage risks that are within their control, but it becomes harder for them to talk about the big, ugly, 'out of our control' disruptors that could drastically change their business. My conversations also made it clear that we need to, quite honestly, challenge ourselves to think about risk in a bigger way to really prepare our businesses for these 'unknown unknowns', a phrase I heard from one farmer I spoke with, Roland van Asten (2022).

When I visited Australia in March 2023, the impact of these disruptors was made especially clear. Farmers in Australia don't have direct payment programs available to them in the way that some farmers in other parts of the world do. So, they have to think ahead to ensure they can get through the unthinkable because there is nobody to bail them out. As I heard from Simon and Rosie Turnbull, when the third year of a drought hits, very few are prepared to weather the storm, such as the drought in New South Wales that lasted from 2017 through 2019. The average rainfall in New South Wales (where they live) is 495 mL, in 2017 they got 100 mL. In 2019, Australia's most extensive river system, the Murray-Darling Basin, experienced its worst-ever drought on record. That same year also saw record-breaking high temperatures which lasted for 36 months (Bureau of Meteorology, 2019). The Turnbulls sold their livestock early on and took a financial hit upfront, knowing that they couldn't feed 1000 head of cattle. They were left with four cows and two bulls, but they didn't have to break into their equity. It was a hard decision, but they had discussed their options in the face of drought before. "One thing we can guarantee in Australia is we'll have another drought", Simon said. "Those conversations were hard but valuable. Our daughter is a crop advisor and that helped with conversations." But their approach wasn't the common approach. Many who did feed their stockers either ate up their equity or went broke.

2.3 Preventable Risk in Agriculture

The truth is that risk management is an essential business process which can be incredibly hard to put into practice for many technical, organizational, and psychological reasons. However, there are ways of addressing these challenges that work: breaking down risk into preventable, strategic, and external risks is one way of taking on that challenge. In this first section, we will look at preventable risks.

Preventable risks are those risks that are largely within a farmer's control and can be mitigated through proactive measures. Farmers and business owners are able to manage these risks through active prevention: monitoring operational processes and guiding people's behaviors and decisions toward desired norms (Kaplan & Mikes, 2012). Preventable risks require discipline and follow-through. They present no strategic benefit, but they are a cost-effective way to avoid or eliminate the occurrence of risks that can be prevented.

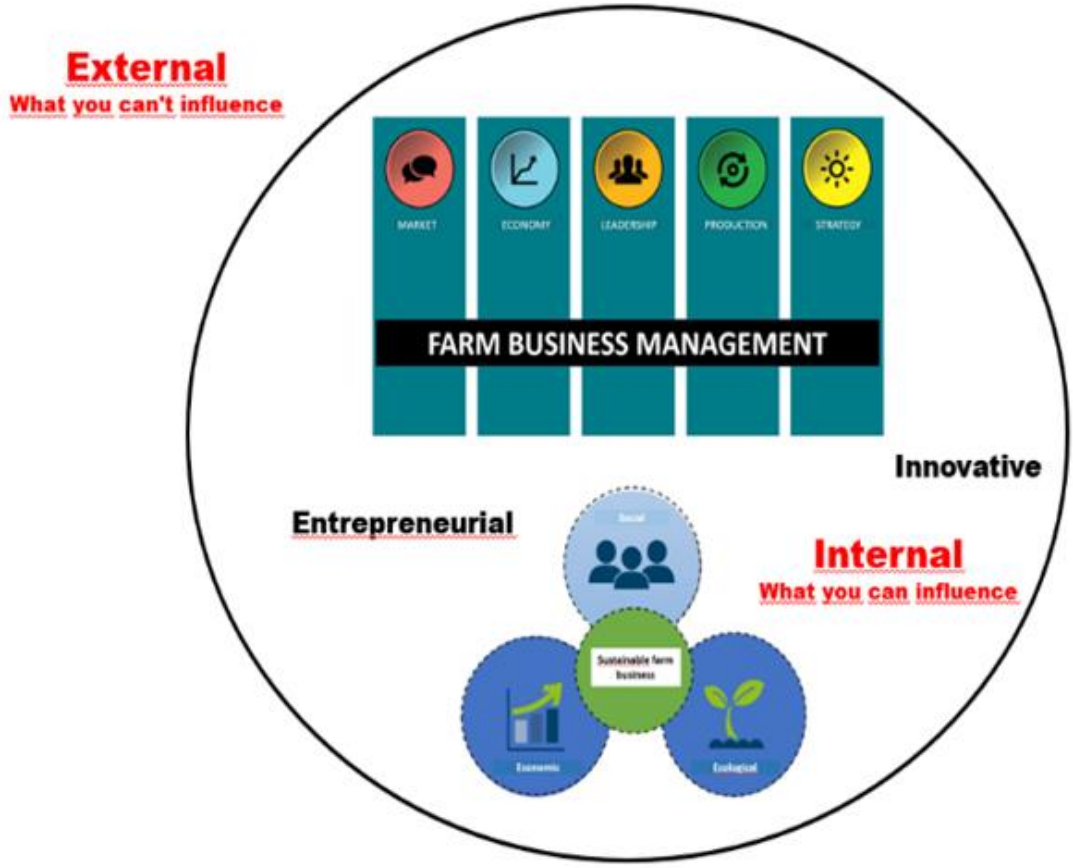
Ove Karlsson, a Swedish farmer I spoke with (2022) grew up on a farm with a passion for agriculture. He realized early on that, although his asthma was an impediment to taking over the family farm, he could still work with farmers. After graduating with a degree in agricultural science and economics, he began applying his understanding of finance and its effects on farming, to help farmers. Ove eventually developed tools for farmers (based on LEAN principles[1], informed by his research into international educational tools such as those at Purdue University and Harvard, among others, and jurisdictional industries) that can increase revenues, set strategies, and learn where opportunities can be found for improving business management. "The most common strategy for farmers is to not have a strategy, and I wanted to change that" (Karlsson, 2022). Below are two figures which Ove uses to teach farmers about business risk management.

Figure 1:Five Pillars of Business Risk Management (Ove Karlsson, 2022)

Market	Activities a company undertakes to promote the buying or selling of a product or service. This area also refers to the way in which a farmer communicates with society.
Economy or Finance	The management, creation, and study of money and investments, analysing business, liquidity, profitability, etc.
Leadership	The organization of the business, the way in which you lead and create expectations for your team to generate a successful organization.
Production	Often where farmers find their strength. It is the reason that they got into the business in the first place. The processes to support production refer to documenting the most effective and efficient way to go about ensuring a consistent and highly valued product each time.
Strategy	The business' masterplan, a process used to set the long-term vision, mission and strategic goals or objectives of the organization. It includes a plan which guides decision-making processes to improve the company's financial stability and reach its objectives in a competing market.

[1] Developed by Toyota's Taichi Ohno, these are defined as "1) defining value, 2) mapping the value stream, 3) creating flow, 4) using a pull system, and 5) pursuing perfection (Womack, Jones & Roos, 1990).

Figure 2: External and Internal Risks (Ove Karlsson, 2022)



Using the table above (Figure 1)[2], Ove begins working with farmers by asking them to rank themselves out of seven in each of the pillars. Often, the results are uneven: farmers score high in some areas and low in others. Ove suggests that a successful business requires high scores in all areas and his training encourages farmers to take the time to sit and think about their farm business and the opportunities for improvement. "This is not how Swedish farmers traditionally think and they have a long way to go" (Karlsson, 2022).

Although the five farm management pillars (Karlsson, 2022) listed above are crucial to success in running an agricultural business, these should be considered the bare minimum in risk management. The successful farmers I spoke with during my travels went far beyond this and next, I will introduce how they thought and spoke about strategic risks and external risks.

[2] The United States Department of Agriculture also categorizes risk into five types: production risk, price or market risk, financial risk, institutional risk, and human or personal risk (USDA, 2023).

2.4 Strategic-Risk Taking by Farmers

Strategic risks arise from the dynamic nature of the agricultural sector, and are influenced by shifts in technology, regulatory changes, and evolving market dynamics. Farmers I spoke with tended to embrace innovation and technology to optimize operations, embracing data-driven approaches to decision-making. Adaptive strategies allowed them to pivot swiftly in response to fluctuating market conditions, ensuring resilience and competitiveness in the face of change.

> *"Lead the dance. Farmers have to continually adapt and be able to look at their operations, be honest, look at new and different ways of doing things"*
> -Rob Bradley (March 2023)

Strategic management is the ability to anticipate, adapt to, drive, and capitalize on these changes. Allan Gray (2023) is a professor at Perdue University and, as he points out, we will always have growing pains if we are a successful company. Even when we are constantly working on staying ahead, as one pain gets better, others become more challenging. It's not about getting to a point of never having to manage change, it's about getting better at managing change by managing it more strategically. This can begin by realizing that the pain of staying where we are is far worse than the pain of going where we are going. It is about moving from being entrepreneurial, (where most farmers are comfortable) to being professional. As we make that move, we will find ourselves starting to manage the uncontrollable.

In his presentation at TEPAP (2023), Allan Gray clarified why farmers often talk about the strategic work but give various reasons for not implementing strategy, such as "There aren't enough hours in the day", "I spend too much time putting out fires", "If I'm going to do it, I've got to do it right" (which can result in not doing it at all), and "Meetings are a waste of time". In his experience, farmers often have good plans but very little follow-up, so things don't get done. Some also feel insecure about their leadership role, while others note how sales are growing but profits aren't keeping pace.

For Allan, an important part of strategic management is ensuring that all roles in the business are explicit in both responsibility and accountability. When we miss this, things fall through the cracks and are overlooked. Allan Gray explains this by using a military analogy. In his talk, he asked us: "Are you the general or are you the infantry? Most farmers would answer by saying that they are both. Why were the allies successful in Normandy? It's because they worked together. The generals were not getting shot at. If you are both the general and the infantry,

> *"Because we take on both roles, we get doing things right confused with doing the right things"* -Allan Gray (2023)

you can't make the tough decisions. If you're in the line of fire, you won't make the right decision. At times, we have to separate ourselves and we have to make a change. Our job is to win, even if we have to sacrifice something in the process. Generals are responsible for strategy. Because we often take on the role of infantry, we get operational effectiveness confused with strategy."

Strategic positioning is creating a unique and sustainable competitive position; it's choosing to run a different race. A good strategy includes a unique value proposition, a different or tailored value chain, clear trade-offs, and choosing what not to do, activities that fit together, and having a plan to sustain the strategy and invest in the capabilities and activities needed to accomplish it.

First, Allan recommends spending time on what is necessary for the long-term consistency of the value proposition to create clarity for the business, the customer, and the channel partners. This allows farmers to focus on building unique skills and assets to deliver the value proposition. Then, focus on how to do things right by: improving ways to realize the value proposition. Sustaining the value proposition means constantly learning and making the changes needed for continuous improvement.

In my interviews, farmers often wanted to be innovative and find new ways to reach their mission. Simply doing things right did not get them where they wanted to go. They needed to focus on how to achieve key result areas. It wasn't about writing goals but rather, delivering on objectives. Finally, farmers talked about the importance of measuring their results.

> *"What gets measured gets done. What gets rewarded gets reinforced"* -Allan Gray (2023)

Farmers I spoke with recognized that strong execution happens through people. People will do what they are measured for and rewarded for, but it is up to the owner to ensure that they are measuring and rewarding the right things. Insights such as these are effective ways of implementing a more strategic, professional management approach on farms.

Another important insight into strategic risk-taking came from Murray Sholtz, a Nuffield scholar and farmer from New South Wales, Australia. Murray is on the later side of his career and experience has led him to emphasize one particularly important aspect: the role of decision-making in taking strategic risks.

Farming hasn't always been easy for Murray, and he had to learn some things the hard way. The family farm dates back to 1919 and when he first started farming, he worked alongside his father, uncle, and cousin until 1995 when they split up the farm. From that point, he was able to grow the farm to 2500 acres and then in 2005, he made a strategic decision to invest in an additional 1600 acres. It was a massive bite but he was confident he could make it work. It was at that point that he learned a hard lesson about decision-making.

His banker suggested that to offset the risk of getting bigger, he should hedge his crop[3]. Murray felt apprehensive about that strategic decision, but on the banker's advice, he went ahead and hedged his crops.

Figure 3: Murray Scholtz (Photo Credit: Amy Cronin)

When he made that decision, Murray could never have predicted that 2006 would be the worst drought in 100 years, or that 2007-2009 would see continued drought, followed by two years of flooding. His cash flow was doubly impacted by the hedge on grains that he couldn't fulfill. Quite honestly, as I listened to the story, I found it hard to imagine having to deal with such an impossible situation. As Murray wryly put it, "There was no way to have a risk management plan for that." That one strategic decision to use a risk mitigation strategy suggested to him by a third party 'expert' had a huge negative impact and in Murray's words, made him wary of working with third party experts: "They can tell you how to manage risk, but they can also just walk away when it doesn't work out."

The difference in that example is that the risk was asymmetrical. Murray had "skin in the game" in a way that the banker did not[4]. This highlighted a common theme that I heard from farmers: many people who call themselves experts don't truly understand or communicate the downside risk, leaving farmers exposed and uninformed of the real risks they are facing, and therefore with a false sense of confidence. This is one of the reasons why (as I explain in later sections of this report and in my recommendations), I believe strongly in the value of farmer-to-farmer conversations and peer groups who are committed to sitting down together and discussing risk management.

When a farmer needs to make a big decision and is seeking advice, other farmers will come to the table with a shared, experience-based understanding of farming. The *content* of their advice will reflect that experience. But even more importantly, their *process* of decision-making, the way they make decisions, will reflect the fact that farmers share a more symmetrical risk profile because they also have "skin in the game" of farming. The way farmers make decisions reflects what is important to farmers. The way a banker (or another third party) makes decisions is not

[3] Hedging your crop is a strategic decision and one that (as farmers know) carries the possibility of both risk and reward. However, experts will often tell farmers to "hedge a crop" without mentioning ways to offset the risk (using puts and calls), leaving farmers vulnerable.

[4] These concepts ("asymmetrical and symmetrical risk" and "skin in the game") come from work by Nassim Nicholas Taleb, a mathematical statistician and former options trader whose work focuses on risk analysis. These concepts and others are explained in detail in his book *Skin in the Game: Hidden Asymmetries in Daily Life* (2018)

"symmetrical" because they have skin in a different game, so to speak[5]. At this point in his career, Murray made another strategic decision, and this one paid off. He decided to do a Nuffield, and then went on to attend TEPAP.

> *"As Jim Collins says, 'when you get a new idea, you need to grow it slowly and perfect it' because the bigger you get, the better it is. You get better as you get more professional, so face your fears: the difference between a good manager and a bad one is that a good manager does challenging things even when they don't want to"* -Murray Sholtz (2022)

He made the strategic decision to go on a quest to figure out how to save his farm, after coming to the difficult realization that what they were doing simply wasn't sustainable. These harrowing adventures taught him valuable lessons about how to ask the right questions of others, and of himself. Since then, he has continued to take professional courses (and also sits on many boards) and after embarking on this educational journey, he hasn't farmed the same way since.

More recently, Sholtz diversified into sheep and beef, made use of every piece of land to the fullest, put his livestock on the hilly ground and managed his crops to minimize fertilizers, and make use of intensive grazing and manure produced by the livestock. He has been keeping data on his land since 1997, so when it comes time to start winding down, he knows which piece of land to sell.

Although Murray has put several preventable risk mitigation strategies in place, his story speaks primarily to the importance of making informed decisions when it comes to strategic risks. He had to learn to balance the risk/reward equation as he considered how to move forward. Pushed forward by necessity, he found that the more he developed a more professional mindset, used the data of both production and finances, and got his five pillars of business management in order, the more comfortable he became in making strategic decisions.

> *"A wise person knows what might be around the corner, a wiser person knows he doesn't know what's around the corner"* -Bill Malcolm, the University of Melbourne (March 2020)

[5] These concepts ("asymmetrical and symmetrical risk" and "skin in the game") come from work by Nassim Nicholas Taleb, a mathematical statistician and former options trader whose work focuses on risk analysis. These concepts and others are explained in detail in his book *Skin in the Game: Hidden Asymmetries in Daily Life* (2018)

2.5 'We Instead of Me': Managing External Risks in Agriculture

External risks emanate from factors beyond a farmer's control, such as extreme weather events, pests, diseases, and geopolitical tensions. It seems that every year, the number of external risks, including the 'unknown unknowns' are increasing. Three-year droughts, wildfires that rage for months, COVID-19, the Russia/Ukraine war, and African Swine Fever (ASF) were all major disruptors. Each one came without notice, disrupting business in astronomical ways.

In this report, I talk about meeting Roland van Asten in the case study on the Netherlands. Roland is a hog farmer working in the family business, the Van Asten Group. The external risks have been coming at them on a regular basis: first COVID-19 hit in March 2020, and then that September, African Swine Fever was found in Germany (where they also farm). 2021 brought the invasion of Russia into Ukraine and in 2022, the Dutch government announced that it was going to reduce livestock in the country by one third to reduce nitrogen pollution (Symons, 2023). These are real-life examples of external risks and they have wreaked havoc on the Van Asten Group's abilities to plan for the future.

Marcos, Roland's brother, has since started spending more time trying to find a way to recognize these unknown unknowns, but risk management is something that the Van Astens have paid close attention to for many years. As I toured their second-generation farm, built on the footsteps of his mother and late father, Roland pointed out the many different innovations and risk management strategies they have put in place to ensure that the Van Asten Group will carry on for generations to come.

It was clear to me that this family had spent a great deal of time thinking about preventable risks, and implementing processes to ensure that they were protected in all areas over which they had control. Their vision, mission and strategic intents were posted proudly for all to see, and their processes were written out for employees.

Strategically, they had made decisions such as investing in air scrubbers (which remove 90% of emissions and reclaims heat for use in other areas) and designing and implementing a fire prevention device to close columns and prevent fire from spreading. They could foresee wider social and consumer trends and see where and when political will would move in that direction, and they have made strategic decisions to become more sustainable in advance of policy changes. They mitigate the risk of high production costs by improving production and now have incredible production rates (32-33 pigs per sow per year). However, another risk is beginning to overtake production: the risk of government intervention. Their production rates are now limited due to animal welfare legislation, and Roland also talked about the risks of recently passed restrictive laws on agriculture: climate policy, nitrogen restrictions, planned reductions of livestock numbers, to name a few.

Having given due diligence to the risks they can see (preventable and strategic), the Van Astens have realized that it is the bigger unknown unknowns, the risks they can't see, that are the

biggest risks facing their operation. Even with their considerable skills and knowledge, they can't seem to find a way to effectively manage or address these risks.

The Van Astens are not alone in recognizing that they are coming up short on this front of risk management. But they are ahead of the game in one way at least: they are comfortable thinking and talking about external risks, and this is a critical aspect of managing external risks.

Why Farmers Don't Talk About External Risk

Kaplan and Mikes's advice is that companies should tailor their risk-management processes to the categories outlined above: preventable risks should be managed with a compliance-based approach, but strategic and external risks require a different approach: open and clear discussion. In general, that is great advice. But applying that advice to farming will inevitably miss the mark because of one big difference between the corporate business world (Kaplan and Mike's intended audience) and the farming world.

When I talked with farmers, they were able and ready to take ownership for the controlled risks that they may or may not encounter on their farm. But when I asked farmers who (within their organization) they discussed these risks with, they often named their partner, not their team. Therein lies the difference. In farming, farmers bear the weight of risk management on their shoulders and often their shoulders alone, especially if they don't have partners in the business. In the corporate world, risk management is handled by a team. They may not get it right all the time, but the practice of discussing risk as a group gives them a definite advantage.

Not being able to rely on a team or a group for support has serious disadvantages, and those may include consequences to farmers' mental health. Andria Jones-Bitton of the Ontario Veterinary College at the University of Guelph has been looking at the mental health of farmers since 2015. She found that "when you think about the wide range of stresses that our farmers experience on a day-to-day basis, most of those stressors are outside of their control" (Canadian Federation of Agriculture, 2019). In other words, they are external risks.

One recent survey (Hagen et al., 2021) found that the mental health of farmers is worse than it was five years ago and worse than the general population. 76% of farmers said they were currently experiencing moderate or high levels of perceived stress, and COVID-19 only added to that. "It's a troubling situation", said Jones-Bitton, in an article in the London Free Press. "Farmers have long faced occupational stressors due to the weather, their workload and finances. The pandemic, however, added new stresses such as increased costs, reduced seasonal agricultural farm workers due to travel bans in 2020, and farm processing backlogs due to workers and trucker drivers being ill with COVID-19." (Jones-Bitton, quoted in Antonacci, 2022)

When it comes to external risk, Kaplan and Mikes (2012) point to studies which found that people tend to overestimate their ability to influence events that are, in fact, heavily determined by chance (such as external risks). We tend to be overconfident about the accuracy

of our forecasts and risk assessments and far too narrow in our assessment of the range of outcomes that may occur (Kaplan & Mikes, 2012). We also tend to base our decisions on the evidence that is right in front of us and on the most recent events we can remember. It is a human tendency not to think about a highly uncertain future.

Humans are also pattern-seeking creatures: we look for patterns in our environment that conform to our prior experience. But in doing so, we also tend to only see what confirms what we already know to be true[6]. Like many of our survival mechanisms, this can lead us into situations which only compound the problems we are facing, propelling us to favour information that supports our position and suppress information that contradicts it (Kaplan & Mikes, 2012). As a consequence, we tend to listen to information about success more than we listen to information about possible failure. When we are under increased stress (such as when we are facing the stressors of external risk), we tend to double down on the path we are already on and become even firmer in our convictions, spending even more money and resources to try and turn around our failed course of action.

This is especially true when we find ourselves in a position of having to make decisions. Two economics researchers, Daniel Kahneman and Amos Tversky (1979) discovered that when it comes to making decisions, our minds are susceptible to unconscious biases that tend to cloud our best judgment. They also discovered that humans are wired to think in two ways: fast (unconscious, effortless 'snap' thinking that makes up 98% of our thinking), and slow (the more rational, conscious and self-aware part of our thinking that makes up only 2%).

In the course of an average day, we have to make about 35,000 decisions (Groenewegen, n.d.) and we would like to think that for the 'big' decisions in life and work, we use the more rational 2% to think those decisions through. But we are wired for survival, not rationality. Before we can engage our 'slow' thinking, we need to feel and understand that we are not in danger. The presence of external risks tends to trigger our sense that we are in danger and consequently, our fear takes us in only three directions: fight, flight, or freeze.

None of these directions are constructive to thinking in the rational, open-minded ways that are recommended for managing external risks. The good news is that we can learn to think about external risk in a way that takes into account how we actually think and make decisions: using a 'we instead of me' approach to thinking and talking about external risk. The better news is that taking this approach can lead to positive effects on our well-being and mental health as farmers.

How to Think and Talk About External Risk

Alex Sidorenko, a risk management consultant, takes this into account when he describes how we don't cope well with external risk when we are paralyzed by fear and misunderstanding and that inevitably, this does not lead to making optimal decisions.

[6] This is known in the psychology literature as "confirmation bias".

We need to be able to talk through what external risk is, because on the other side of that "fight, flight, or freeze" reaction is the realization that our fears are likely unfounded. Our response is based on a survival mechanism that evolved to keep us from immediate physical harm. Although facing unknown unknowns may feel like being suddenly jumped by a tiger—that is rarely the actual danger facing us!

At the end of the day, we are going to have to face the external risks that come our way and we are going to have to make decisions about how to manage them. Our best decisions are made when we are feeling clear-minded and curious about the world: the complete opposite of feeling stuck in jumped-by-a-tiger mode.

Talking with farmers around the world led me to see that there are two main reasons that we don't think and talk about external risk:

a) We are afraid and we get stuck in our fear
b) We don't understand what moving beyond this actually looks and feels like

The farmers I spoke with who could work through their fears with a trusted group of people, envision multiple scenarios, and look at different decisions they might have to make were able to surmount these barriers to thinking and talking about external risk. As a result, they could manage their strategies for dealing with external risk in a more effective way.

I heard this from both Roland van Asten in the way he and his family dealt with the "triple punch" of COVID-19, ASF, and the Russia/Ukraine war, and also from Judith de Vor when she described how her family dealt with the impending environmental regulations that are threatening their financial security (in the Netherlands case study). I also heard it from the Kuijpers family, who consult on a regular basis with a peer group (more detail on this can be found in their case study). Dave Gooden and his brothers were able to come together and plan a truly unique farm structure that worked for them: but it took time, effort and difficult conversations (and this is outlined in the case study on Dave Gooden). In the case study on Norway, Kari Signe Lysne talks about how the culture of cooperation in Norway has led to the forming of cooperatives, a fundamental element in Norwegian agriculture. Lastly, the case study on Cissi Klasson includes a description of how she empowers her employees to work together, and problem solve with each other.

It turns out that when we take a "we instead of me" approach to external risk, we find that decisions are more manageable, and the situation feels less daunting. But before getting to that reward, we need to be willing to risk something that every human finds challenging: our vulnerability. Andria Jones-Bitton's work touches on the way that farming culture often prizes a tough exterior. A quote by Henry David Thoreau rings true for many of us: "The mass of men lead lives of quiet desperation". But it doesn't need to be that way. Discussing risk means being open (including first, with ourselves) about what we most fear and what we find most difficult

to think about and that requires a certain level of vulnerability and an ability to listen without judgment.

But if there is one lesson we learned from COVID-19, it is that we are strongest when we can be together, and it's when we become isolated that we find ourselves really struggling. We are social beings and we evolved to function in groups, not on our own. We are wired for interaction and attachment to other humans and we need those connections to survive and to be at our best. Our brains release essential hormones (dopamine and oxytocin) that are critical to our mental health, when we are in healthy relationships with others and these hormones play important roles in reducing stress, regulating our emotions, and plays a role in our most necessary functions, like sleep and hunger (Naturopathic Doctor News and Review, 2017). There are definitely challenges to being in a group (community, family, team or otherwise) but humans have a long history of being able to work through them, and a long history of dealing with external risks as well.

Confronting external risks when you know there are people who have got your back is worth the work of building a team, peer group or integrating discussions on risk management into an existing group. Whatever the risks we are facing will be less daunting than what our minds could have imagined without having done that work first. It could be a real thing, to feel prepared to face external risks with plans A, B, C, and D because you have worked through all the pieces, overcome your fears, and empowered yourself, and others, through the process of decision-making. Stress will still be present, of course, when the external risks come along, but having a less-than-perfect process is better than having no process at all. What matters is that we recognize the importance of risk management on farms.

In the next two sections (3.0 and 4.0), I will present case studies related to local risk management, and to government risk management. Following these case studies, I'll tie together the themes and lessons in an analysis of what I learned from the people I interviewed, who have extensive personal and professional experience in these areas. I'll also include information I learned from journal articles, statistical sources such as the Organization for Economic Cooperation and Development (OECD), as well as country-specific data from national and international sources.

3.0 CASE STUDIES: LOCAL RISK MANAGEMENT

3.1 Kuijpers Kip: Two Steps Ahead, Embracing Innovation

Figure 4: The Kuijpers Family (Photo Credit: DeKloekeKip.nl)

Many years ago, the Kuijpers family foresaw the move to more sustainable agriculture and planned to build a small-footprint, carbon neutral chick production unit in the Netherlands. After 15 years of intense consultations, brainstorming and working to get permits, they were finally able to build their one-of-a-kind dream. Each innovation they incorporated had to achieve a threefold goal: it had to be better for the animals, provide efficiency and financial gain for the company, and it had to protect the environment.

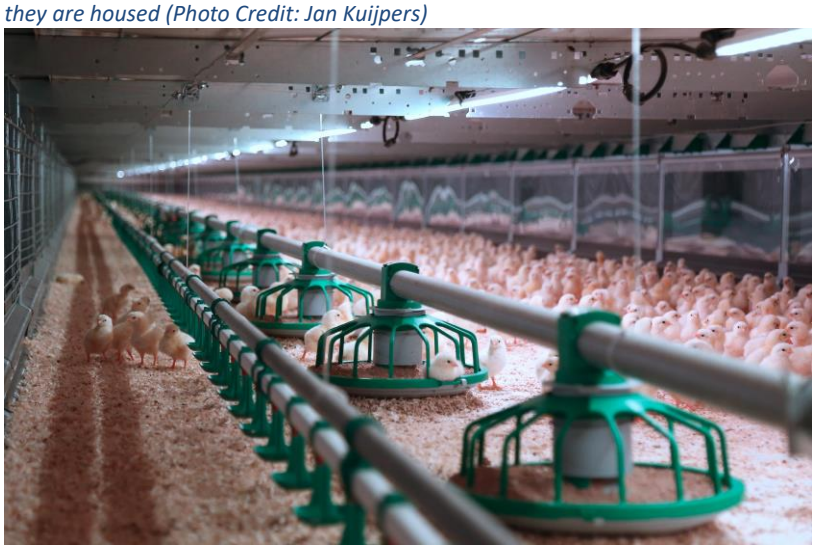
Jan Kuijpers is proud as he shares the story of how his family persevered through government regulation and red tape, researched the newest and best technologies, and courageously built the first step of what he hopes is an incredible farm-to-table operation. Today, they have a state-of-the-art chicken facility. The journey was not for the weak of heart, but the best way forward is to get started.

The Kuijpers family dream was to build a new barn and processing plant, incorporating as many steps of production as possible into their operation, and limit the trucking so commonly seen on conventional farms. Jan Kuijpers, the next generation to invest in ownership, told me how they got started. The first step was thinking about the size of the processing plant that they wanted to build. They had to take a few factors into consideration: labour efficiency, the time required to run it, and their ability to market the chicken. From there, they worked backwards to design the six-layer barn, which requires no fossil fuels and is equipped with air scrubbers, energy recovery systems, and solar panels.

Figure 5: View of the Farm (Photo Credit: Jan Kuijpers)

Since then, they have continued to innovate. Blockchain technology has been integrated to ensure traceability throughout the entire value chain. They've also partnered with their neighbour to build a biogas plant, utilizing his expertise and hog manure, and contributing their chicken manure to produce energy as an additional source of income. There are no subsidies for the farm itself but there are subsidies for the biogas plant. From the outside looking in, it appears that their business plan is solid, well thought out, and built for success.

Figure 6: De Kloeke Kip Chickens in one of six stacked levels of the barn in which they are housed (Photo Credit: Jan Kuijpers)



During my visit with the Kuijpers family, farmers were protesting at the provincial government building in North Brabant and had blocked a number of highways with tractors and hay bales. They were angry with the new environmental policies that had recently been announced. When I asked if the Kuijpers were worried, Jan answered carefully. They have invested in innovations to produce chicken with very low emissions. If the government takes that into consideration, then the Kuijpers farm should pass muster with the new regulations. But they don't know how the government is making its calculations, or whether they need to prove continuous improvement, even though they are already miles ahead of other producers in the same industry. It could turn out well for them, but it could also really play against their favour. They will have to wait and see.

Despite their impressive commitment and investments in innovations, the Kuijpers' bigger dreams, building a processing plant and developing their brand, have been mothballed, and the reasons seem to defy logic. The Kuijpers want to build a closed cycle and minimize transport, and their hard work and perseverance have built one of the most innovative climate and energy systems in the world for chicken, but the public has refused their product because of one factor: the number of chickens on the site.

Some animal activist groups have focused their efforts on boycotting products that come from farms with a “large” number of animals, while the government has indicated that they want fewer emissions with a small carbon footprint. Therein lies the conundrum. Even though Kuijpers Kip has invested millions of dollars in achieving this, the public wants smaller farms and completely dismisses the strides made in environmental sustainability. Animal activist groups targeting “large” farms threaten to boycott chain stores that sell the Kuijpers brand, “De Kloeke Kip”. This has ensured that the brand the Kuipers developed, cannot be sold in retail outlets in the Netherlands.

Figure 7: De Kloeke Kip Logo (Photo Credit: DeKloekeKip.nl)

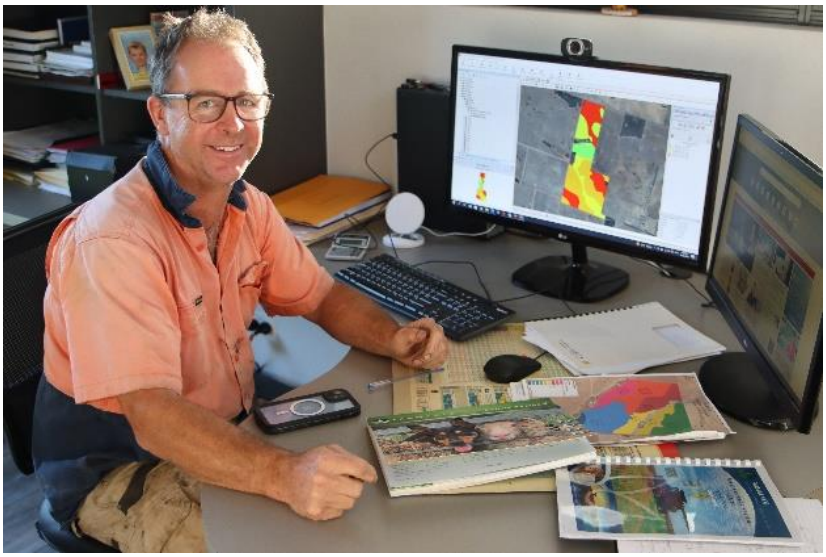
Jan tells me that he does not believe in having a risk management plan, saying “having a risk management plan doesn't work. There are more risks in the market now. We had a plan but there are new things happening: energy and gas are up [because of] the war. It’s very difficult to make an RM plan because every week the risks change, which makes it very difficult to make the right decision in the moment" (Kuijpers, 2022). The Kuijpers do, however, have a peer group that they benchmark and solve problems with, and they also have a succession plan. They are currently working on figuring out the next steps of their business plan. They have no plans to stop innovating.

The Kuijpers see their innovations as a form of risk management. They have researched and put into practice what they understand to be better for the environment, better for animals, and better for humans. They are committed to continually improving in an open and transparent way. They believe that their innovations can make a difference in a country known as the most “chicken-dense” in the world (Sustainable Food Trust, 2016) and they are willing to take strategic risks to make that happen. As Marcel Kuijpers describes, their drive to take responsibility for their product further down the chain, is unstoppable.

Figure 8: Chicks are hatched on the floor where they will be raised, ensuring quicker access to food and water (Photo Credit: Jan Kuijpers)

3.2 Dave Gooden: Think Like a Business, Act Like a Family

Figure 9: Dave Gooden (Photo Credit: Amy Cronin)



Note. Dave Gooden sits at his office with many of the risk management tools he utilizes on-farm, including the report provided by his business consultant, the benchmarking report showing his individual results in comparison to others, and the soil maps used to make decisions, etc.

> *"If you're good at what you do, you'll succeed."*
> -Dave Gooden

Travelling to Australia to look at risk management was high on my priority list. More known on the news in Canada for its wildfires and droughts, it is less known for its unique agricultural sector, and specifically its lack of subsidy programs.

Agriculture is a big industry in Australia, and accounts for 55% of land use. In just twenty years, the gross value of agricultural, fishery and forestry products has increased from approximately $59 billion in 2002-2003, to $93 billion in 2021–2022, a rise of 59% in gross value, adjusted for consumer price inflation (Australian Bureau of Agricultural and Resource Economics and Sciences, 2023). These products rose in value of output for different reasons and varied by sector. The rise in price of livestock reflects a growing demand for protein in emerging countries, in addition to the impacts of African Swine Fever (ASF) in meat importing countries, and the drought in the United States. Crops, on the other hand, fell in price but output values were offset by increased production, due to technology advances and management practices.

Agriculture in Australia is also diverse, and production includes a range of livestock and crop products, depending on a region's soil type, water availability, climate, and proximity to markets. Grazing livestock (primarily cattle and sheep) are common throughout the country,

but cropping and horticulture are mostly found close to the coastal regions. Just like Canada, it's a big country, and the landscape and climate vary widely from state to state, and jurisdiction to jurisdiction. The government has indicated environmental sustainability as a key priority (Department of Agriculture, Fisheries and Forestry, 2023).

There are also significant challenges to agriculture, with rollercoaster-like booms and busts from year to year. From 2017 through 2019, Australia experienced an east coast drought, which was followed by record-breaking production from 2020 to 2022. This had the effect of suddenly transforming many very poor production areas into very profitable areas.

As part of my Nuffield, I visited New South Wales (NSW), a state in southeastern Australia, which has a diverse landscape and climate that includes the productive coastal region to the east, and the drier and more difficult terrain to the west. In my travels to NSW, I saw a wide range of farms: irrigated and dry land, livestock and cropping operations, winter crops and specialty crops, and new technologies being implemented. NSW has more farmers than any other state in Australia, and since there are no government subsidies in, risk is top of mind for these independent and resilient farmers. My conversations with them were riveting. I heard about risks that included severe droughts, mouse plagues, water access issues, and government policy. I heard about new risk management tools such as business consultants, irrigation systems and dam building, technology integration, burying feed, careful budget considerations, and savings accounts. But among Australian farmers, I kept hearing about one farm in particular, owned and operated by the Gooden brothers, and its CEO Dave. I was fortunate to visit this well-run and successful operation during my travels.

Agoodco Farm

> *"It is only by constant change that a river remains a river. You need to farm like the future is already here"* -Bill Malcolm, University of Melbourne (March 2020)

The Gooden brothers' farm, Agoodco Farm, is a 10,000 acre winter crop operation located in Lockhart, which is in the southernmost part of New South Wales. They have been able to successfully mitigate risk and maximize their farm success by using several strategies in their day-to-day operations: they collect and use data and technology to their fullest advantage; they creatively structured their farm to fit their unique strengths as brothers; and they utilize benchmarking, relationship-building, and an excellent business consulting service. Each of these strategies will be explained below.

Good Data, Good Farming

Dave, the last of the four brothers to return to the farm, joined in 1997 after finishing university, bringing with him a passion for number crunching. At that time, they did not have a succession plan specifically laid out, but each of the brothers were passionate about farming and were involved fulltime in the operation. They've evolved the farm in many ways over the years but in the early 2000s, the Goodens made a big change, making the decision to focus on the cropping enterprise and divest their livestock. They certainly broke the mold.

Dave recalls how their neighbours wondered how Agoodco would survive without the diversification that livestock offered. As Dave explained, "We decided to diversify in our crops and focus on land utilization, moving away from the traditional model of a mixed farm." From there, all focus was on maximizing production and profitability from their cropped land. They have taken strategic risks in adopting new technologies, in order to reap the benefits of mitigating risk through data and research: they have integrated control traffic farming, utilizing tracks to minimize compaction, and ensuring that every pass of the farm can be done to fit the permanent tracks.

> *"In terms of reducing risk, we have done this by developing a farming system which is based around a controlled traffic farming system which means all operations are done in multiples of 13.5m. The seeder and harvester are 13.5, the boom spray and spreading are 40.5m, with all machines running on 3m wheel centre along with RTK 2cm repeatable guidance. The benefits of this are reduced compaction, more timely operations, more moisture, better root development and less dust in dry years.*
>
> *Secondly, this system allows us to retain as much stubble/crop residue as possible because we can interrow sow between the previous years stubble and maintain high seedling emergence, with other major benefits of increase stored soil moisture, building soil carbon, retain more nutrients because we have more ground cover and do not burn residue. So, what has this achieved? A more resilient system and reducing risks. We often find that soil/rainfall moisture is limited at a true critical period in late spring when our crops are developing grain. This was how we reduced that risk"* (Personal communication with Dave Gooden, August 2023)

Over the years, they've utilized technology to measure yield variation, which led to zone mapping and soil types. This meant that they could introduce variable rate application of fertilizer and spray, reducing overall costs and allocating costs to where the highest yield would be produced. All their fields are now mapped for pH and phosphorus. It was these practices that led to their discovery: elevation correlates to yield. If they hadn't taken the risk to try something new, they never would have realized that valuable information. They also pay a

subscription fee to receive highly accurate weather maps for a 100 km radius, a tool that gives them a better indication of weather patterns in the near and not-so-near future, enabling them to be more timely in planting, spraying, and harvesting. Decisions are made to ensure that soils are well taken care of, making strides to retain moisture by reducing exposure as much as possible and incorporating organic matter. Note. On-farm research is imperative to ensure that Agoodco Farm is constantly evaluating new techniques and management practices. Figure 11, a photo taken just after the Goodens had finished harvesting, illustrates how they left some stubble high and other paths low, to see if the higher stubble would help the soil to maintain its moisture better than the soil with the shorter stubble.

Figure 10: Looking at moisture retention in an area where the Gooden brothers are doing research to discover if higher stubble left in the field helps to retain moisture in the soil (Photo Credit: Amy Cronin)

Figure 11: A research plot on-farm to test the difference in moisture content in the soil in high vs. low stubble (Photo Credit: Amy Cronin)

Timing is everything when it comes to operating a large crop farm. Installing an air strip has allowed the Goodens to save time and money when planes are brought in to spray. There is no waste in travel to refill each time, ensuring that more of the crop is sprayed in a timely manner.

Farm Structuring and Succession

Dave is also a Nuffield scholar (2010). While doing his Nuffield, he was on a search to find successful farm business structures that would enable a viable career with his brothers. He wanted something that would allow each brother to strive for his own goals and "remove the personal family stuff" while growing the farm, in a way that could utilize each partner's skill set and enable the full use of government programs. The results of his work have proven successful. The operating company is owned by all four brothers and under that structure, each brother owns land which they lease back to the operating company, which runs the crops, owns the machinery, and has access to the skills and capacity. Traditionally, farm children split the assets, farm on their own, and each will have to buy their own equipment and operate their individual companies on their own. The Goodens chose to do things differently and it has paid off in a myriad of ways.

There are many advantages to the Gooden's structure, and Dave attributes these advantages to their success. The innovative design allows the brothers to own their own land, while benefitting from a larger economy of scale. Specialization was a key determining factor to the development of this structure, and jobs were allocated according to skillset: sowing, trucking, welding/fabricating, and spraying. Together, they determine their goals and work together to achieve them for the good of all.

In terms of risk management, they have spread the risk by sharing the risk. Each brother owns the land where he lives and can decide where to spend his individual

WHAT MAKES A GOOD BUSINESS CONSULTANT?

When I asked farmers about working with business consultants, what became evident was that it's about finding a good match.

Rodney and Kate Gofton, dairy farmers in Tasmania, first needed an 'If the cows can't eat it, you can't have it" approach, to get to the point of financial stability. Then, they were able to change the deciding factor to "If it doesn't make your life easier, we don't do it" (March, 2023). Having a third person who comes in and asks the hard questions takes being on the same page.

Owen Woolley and Caitlin Radford, two young farmers in Tasmania, use a business consultant who is also a bank manager, and an entrepreneur. His clients are representative of local farmers, and so he can draw from the general knowledge pool. "He's very human and involved and talks realistically. He doesn't name drop but he can share information gained in his role" (March 2023).

Simon and Rosie Turnbull (New South Wales, Australia) found that they needed a business consultant who didn't need them to nail down a specific plan, which would take away their ability to be flexible. "Flexibility is what has enabled us to be resilient in changing times" (March, 2023).

earnings. If it is invested in the land, it can be leased back to the company, which has a policy to pay the same lease payment for all land, no matter the value, soil type, etc. Each brother is paid the same wage from the operating company, no matter their education or skillset. Dave tells me that some things are done simply to keep the peace, to make things easy, to remove the potential pitfalls of working together, and to allow them to focus on the business. It is an efficient and creative use of economy of scale, and most importantly, it not only works, it works for them.

Developing a structure cooperatively was not without its challenges. Together, they had to consider some really big questions: how big of a loan each shareholder would have to take personally to offset any future losses, how to create flexibility for individuals to leave the operating company if they wanted, and how they would deal with a death or divorce. These were not easy conversations, but they made sure that each of these items were addressed in the shareholders agreement. It took two years for Dave to convince his brothers that this was the right way to create their structure and move forward together.

The next generation has not yet decided if they will come home to farm. When they do decide, the Goodens will have to figure out how to integrate them into the operation. They recognize that some of the things that have worked well for them will need to change with the next generation. No matter what, those who do decide to farm will need to have the capacity to run the show. They will cross that bridge when they get there.

For now, Agoodco Farm focuses on their biggest risk advantage, their knowledge and skill sets. To ensure that they have the best information possible to make the right decisions, they hired a business consultant. Business consultants are common practice in Australia, and more than 80% of the farmers I interviewed utilized this type of service. It's worth considering how the lack of subsidies in Australia might have created more opportunities for business consultancy to flourish in the agriculture sector. Or, in other words, how the business of risk management has become more privatized rather than subsidized. Agoodco has used a business consultant for a number of years to get a full analysis of their business and Dave shared with me the annual report he receives. It is, in a word, comprehensive (see Appendix A).

The report not only includes the individual brothers' farm financial ratios, crop outputs and results, but anonymized data of the other 300 clients that their business consultant works with. This allows participating clients within his firm to benchmark their numbers against other farmers in the area.

Benchmarking and Building Relationships

Figure 12: Farmanco Benchmarking and Business Review Reports created specifically for Agoodco (Photo Credit: Dave Gooden)

The benchmarking report is a tangible marker of just how productive that kind of work can be. Dave carefully shows me, in chart after chart, how their farm is doing relative to other farms in southern NSW. It is because of this access to benchmarking data that he understands why his numbers are the way they are, and why he can clearly see where there are opportunities for improvement[7].

He recognizes that Agoodco has advantages in risk management that come through a certain kind of approach to cooperative "risk sharing": Dave and his brothers share their risks, which reduces their exposure.

The 300 other farmers participating in benchmarking data are also part of a wider "risk sharing among neighbours". Shared knowledge can also mean shared risk. Their farm structure, which strikes a workable balance between individual farm autonomy and scalability, has contributed to reduced costs, and this is evidenced in their benchmarking reports.

Dave knows his numbers inside and out and stresses the importance of data in order to succeed. It is data that drives decision-making at Agoodco, focusing on returns that can be generated. For example, last year they applied fungicide at 2T/ha, incurring costs of $20 for the product and $10 for the application cost. That $30 investment netted an additional $800/hectare. "Experience, knowledge, and capacity are at the forefront of risk", Dave says. "Rain drives yield. Temperature and moisture drive disease. I knew I had to spray because it was hot and wet. But everyone had to, so we would have had to wait two weeks for a plane to

[7] The benchmark report doesn't share details on farmers' practices or inputs but readers of the report with an eye for data can make assumptions based on different factors (high rainfall zone, machine efficiency, labour expense, fertilizer and pesticide costs, R&M, phosphoros use, etc.). So, although he may not know who the grower is or where they live (apart from a zone), the trends that emerge from the data of top ranked growers are clear. They may, for example, spend more per hectare on fertilizer and chemical but have higher production and high income per hectare as well (Personal communication with Dave Gooden, August 2023). The Table of Contents, generously shared by Dave with the permission of his business consultant, can be seen in Appendix A.

spray and we would have missed the window of opportunity. With our controlled traffic, we could get on the land and had everything sprayed in five days. Control and decision-making are key."

Programs Instead of Subsidies

Dave is a big believer in deregulation, which he defines as allowing business to run and having the government stand back. He tells me the story of the Australian wheat marketing board, which was deregulated 20 years ago. Prior to the *Wheat Marketing Act*, Australian wheat market business was conducted under "single desk" control but market deregulation in the 1990s eventually resulted in a new act in 2008. Under that new law, anyone who wanted to export wheat could simply apply for a license (Mazzarol, 2012; Mugera, 2016). This gave advantages to individual businesses who could then make their own decisions about sales, timing, price, and buyer. When it comes to the role of government in agriculture, Dave considers it best when individual businesses own the value chain and make the decisions that go along with that.

The Australian government may not provide subsidy payments to producers, but they certainly acknowledge the substantial challenges of the agricultural sector and have created programs to help farmers deal with their risks. Agoodco has ensured that their structure supports the use of one such program, Farm Management Deposits (FMD), and Dave says it has been advantageous on their farm. The programs offered by the Australian government (see Figure 13) are specific to risk management, and this is a different approach than (for example) the Netherlands.

Figure 13: Australian Risk Management Programs

Program	Description
Farm Management Deposits	Allows farmers to set aside pre-tax income in one financial year to draw from in future years when they need it. Income deposited in an FMD account is tax deductible in the year the deposit is made. The FMD becomes part of your taxable income in the year it is withdrawn (repaid).
Farm Investment Loans	Given by the Regional Investment Corporation of the Australian Government, there are a variety of loans, often with interest free components for five years, to aid farmers in investment opportunities to support their farms. These allow farmers to strengthen their farm business to access markets interstate or outside Australia.
AgriStarter Loans	Can assist in buying or establishing a new farm and for farm succession arrangements
Drought Loans	27Can be used for drought preparedness, management, and recovery activities
Plantation Loans	Can support new plantations and the replanting of bushfire-damaged plantations

Farmers also shared with me that when disaster strikes, the government will often pay farmers for losses. Examples of these payments that were shared with me included assistance with disasters such as the recent mouse infestations, wildfires, droughts, and floods.
The Gooden brothers have built an impressive operation, focusing on collaboration, data, and innovation. Their structure is certainly a key element in their success, and it seems that Dave and his brothers have truly been able to build a succession success story. But it doesn't end there. There are many factors that contribute to their farm success. As Dave describes:

> *"The farming system is only as strong as the key decision makers and finance. That's where I believe the evolution of our business structure has given our business a reduced risk profile as well. We have business partners who have different skills and manage different aspects of the business. It also brings greater capacity to finance the operation. We don't have to do everything in the business and can take a holiday knowing the operation continues"*
> -Dave Gooden (August 2023)

3.3 Cissi Klasson: The Risks and Rewards of Breaking the Mold

Figure 14: Cissi Klasson (Photo Credit: Cissi Klasson)

Cissi Klasson grew up near Stockholm, Sweden on a small crop farm, riding horses for sport. She graduated at the top of her class and decided that she wasn't going to farm. But life had other plans. She started working and eventually ended up working on a 1000 sow farm, quickly moving to the role of manager at the young age of 21.

Cissi realized that she was very interested in the numbers, both financial and production, and wanted to learn more. At age 25, she went back to school to study agricultural economics in university and when she graduated, she went back and bought the farm she had been working on, and became determined to break the mold on how to farm in Sweden.

The Role of Trust in Taking Strategic Risks

In terms of business risks, Cissi has taken calculated risks that have paid off. "It wasn't easy", Cissi recalls. "I didn't have the security needed for a loan, so I had to be creative." Cissi was persistent and looked for options outside the typical banking world. Finally, she came across the idea of using a business angel, someone who will invest in a company in return for an ownership stake and their share of the profit.

In the beginning, Cissi and her business angel shared the ownership at 50% each, but she was solely responsible for the farm management and operations. She focused on strong communication but realized, once into the relationship, that because her business angel knew nothing about pigs, he could decide to terminate the relationship if he didn't see a profit. When Cissi saw that the investor couldn't answer fundamental questions like "At what point should we stop doing this?" or "When will we know we have to make a change?", she realized that the risk of sharing 50% of the ownership was simply too big. She had to be able to act on the extensive knowledge she had developed. So, at that time, she purchased an additional 25% of the shares.

Overall, the relationship has been a win-win. The business angel made a profit from his initial investment, and Cissi was able to start farming and run her farm independently.

This move took confidence and trust in her own knowledge and skills, but getting to that point also took something else: trust in others.

When asked how she first closed the deal with a business angel, having never done it before, Cissi says she relied on her network from business school and university. She recalls having to put her trust in others who had skills she didn't have at the time. As she explained, "You have to. I wouldn't be anywhere if I didn't trust people. You have to know your boundaries and limits. When I don't know about something, I just have to know who I can trust, and I use my network to find the skill set I need."

Leadership and Decision-Making in Risk Management

Leadership has been of utmost importance to Cissi. When COVID-19 first hit, she created a written plan and posted it for when "Something dramatic and unexpected happens and labour is not able to make it to work." She says that her team utilized this proactive approach often throughout the pandemic and they still use it today. Cissi and her team are able to set priorities using the plan and do what is necessary with the labour that is available for the short term. She is also making investments to maximize human labour by automating more mundane tasks, where she can.

Figure 15: Valued team member caring for sows with high animal welfare standards (Photo Credit: Cissi Klasson)

THE NATIONAL FEDERATION OF SWEDISH FARMERS

Lennart Nilsson is a board member of The National Federation of Swedish Farmers (which includes most of Sweden's cooperatives). He farms 200 hectares on the Swedish west coast and also represents Swedish farmers in the creation of agricultural policy for the EU.

Like other countries around the world, Sweden has announced ambitious environmental goals for 2030 and they are now having to ask important questions like "How do you take farmers with you in the discussions?" and "How will the public respond if goals are not met"? Despite this, farmers have made a 10-year agreement with the government which includes utilizing biochar, additives, improving genetics, using precision farming.and other environmental best management practices.

Lennart feels that COVID-19 taught the National Federation how to communicate better with farmers and government, and how to utilize technology to be more open and transparent. They have learned how to convey the situation, show the possibilities, and find a solution. They are able to show society and consumers the reality backed by science, and they seem to accept this more since the pandemic. (Nilsson, 2022). Generally speaking, Swedish people trust their government, something that seems to be quite a rare finding internationally.

Recently, she invested in a robotic washer, saving staff time of 250 hours per year. She notes that in terms of how it "pays off", it isn't more efficient, it uses more water, and it doesn't do as good a job. Where it does add value, she says, is when it comes to how employees time at work is spent: it adds value to the labour of employees who can do more meaningful and engaging tasks instead of washing, and that helps improve their mental health at work".

When talking about making difficult decisions, Cissi also talked candidly about the unique difficulties of more political risks (such as those outlined below: biological, labour, straw and biosecurity, and capacity risks) that can involve having to navigate controversial issues or different levels of business relationships. In those situations, she asks herself honestly "Can I see the risks here?" Her ability to look challenging people and problems right in the eye, and clearly see the risks involved in dealing with them, are what allows Cissi to make good decisions about when to stick with something or someone, and when to walk away. She focuses on her passion for pigs and for what she does and works to keep a dispassionate distance when she has to make decisions about difficult people and difficult situations.

Good managers are ones who look to the future and anticipate problems. In 2021, Cissi kept a spreadsheet of every task that she was responsible for. At the end of the year, she realized that there was no one person who could accomplish everything she did. So instead of looking for a single person to replace her in the future, she split the tasks on her list into different roles. I touched base with Cissi again recently and this future-planning has proven extremely beneficial. She has recently had a baby and because she had front loaded that redistribution of her tasks into different roles, she was able to take maternity leave. Because she was able to formulate a plan, she could be confident in knowing that all the tasks would be taken care of, and the outcome of that future planning is working extremely well.

Cissi's leadership goes beyond the farm. Cissi also sits on both the local and national pork board, and she stands out not only because she is the only board member who is not a white-haired male, but more importantly, because she brings a different perspective. Her contribution is important because she has been in the industry for a long time, and she wants to make it stronger. The collaborative, proactive way she approaches risk management has helped her thrive, on the farm and in the boardroom.

> *"We need to think about high performing teams instead of high performing leadership"* -Chris Parsons, Chief Commercial Officer at MyFarm (March 2023*)*

Business Risk Management

Figure 16: On the farm (Photo Credit: Cissi Klasson)

Risk is something that Cissi thinks about on a regular basis. She told me her general strategy for dealing with risk: "You need to know the risks, be aware of them and ask 'Where is the most harm and can I do something about it?' and then, you need to do something about it". Business risk management is important to Cissi, and she follows the five pillars of risk management, as described aboveWhen she has an opportunity to control a process, she does.

Her degree in agricultural economics has helped her to understand the importance of quarterly budgeting and drawing comparisons with the actuals. It also helped to keep her focused on the numbers and helped her to make decisions about where and how to spend money. She has locked half of her interest rates in low, and she pays close attention to feeding costs and energy prices as they fluctuate, constantly, although they generally trend upward.

Production, for example, is one thing that she believes in paying attention to. She feels that production is within her control because of how she empowers her team to keep her pigs free from biological risks such as Methicillin-resistant Staphylococcus aureus (MRSA), Salmonella, and African Swine Fever (ASF). She carries insurance for Salmonella, uses her vet for health advice, and follows rules and regulations judiciously. At the same time, she also has a practical attitude about not losing sleep over prices (which are outside her control).

In Sweden, you can only get into the hog industry if you have a market for your pigs, and you can't market them or book a price in advance. She can, however, lock in a price for her feed by booking her feed through the feed mill, which gives her the benefit of a stable price and working that number into a cash flow. This reduces her exposure to the market and has generated significant savings for her, particularly when she booked her feed prior to the Russia/Ukraine war breaking out.

Her approach to risk involves thinking beyond the general, and she also spoke to how she manages risk on her farm in specific ways. Some of these specific risks (and mitigation actions) she takes include:

Biological risks: Cissi indicated to me that ASF "wouldn't be as bad in Sweden as it would be in Canada, as they don't export so their markets would not be impacted and since it doesn't harm people, they would still be able to eat their product with confidence". However, if ASF was found in her stable, it would still be horrific, so biosecurity is key. She pays particular attention

to Salmonella prevention, as her entire herd would be culled by the government if it was detected.

Figure 17: An employee stands in front of the board of written protocols on Cissi's farm (Photo Credit: Cissi Klasson)

Labour challenges: As described above, Cissi is implementing a system whereby she can manage people without telling them what to do. She does this by writing out each responsibility, by day. This approach allows for leadership without micromanagement: employees can see the big picture for themselves, and problem solve by using those written responsibilities to make decisions. This aspect of labour is so important to Cissi, that she doesn't believe in implementing the use of an app. The risk, as she sees it, is that communication between employees would go down and they would be less apt to help each other with responsibilities. This risk far outweighs the "convenience" of an app. Having each day's responsibilities written out in this systematic way helps to build teamwork, Cissi says.

Biosecurity risks: Keeping group-housed sows on straw is regulated in Sweden. Cissi sees this as an additional biosecurity risk on the farm since, in order to clean out the bedding or add new straw, the barn doors have to be opened wide to let the machinery in and out. In the summer, this becomes a welfare concern because opening the doors wide raises the temperature inside the barn, which leads to pigs overheating and perishing.

Capacity risks: Since the hog industry in Sweden is not vertically integrated, slaughterhouses want small farmers as customers, and furthermore, they need the production to stay in business. However, as a result of this, Cissi isn't able to grow as fast as she would like, since she needs to ensure that there is enough capacity for raising weaner and finishing pigs, and enough capacity at the slaughter facility, before starting the process of building or expanding her operation.

Cissi knows that the customer is a very important part of her business. Although she sells to the slaughter plant and not to the consumer directly, she understands that acceptance of her industry by society is vitally important. She has created and published a pamphlet for the public which describes how she runs her farm, focusing on pigs, people and economics. She also uses the pamphlet to share her commitment to reaching sustainability goals by 2030, and to explain how she plans to meet those goals on her farm. The results have been very positive. Not only does the public appreciate her transparency, but her employees were incredibly proud to be

featured in the pamphlet and be included in a larger vision of what her company stands for. This alone made the project worthwhile.

Cissi's strong and distinct perspectives on risk management hold many lessons. As she shares in her straightforward way, **"**Risk management is hard because sometimes you can see the future and be scared by it. This can hold you back and prevent you from moving the business forward."

Figure 18: The Team (Photo Credit: Cissi Klasson)

"Leaders are best when they can be themselves and need to create environments in which they can fly. Create the conditions where staff have belonging, autonomy and purpose"
-Dr. Ellen Joan Nelson, speaker and consultant (March 2023)

3.4 Jacob van den Borne: Asking the Right Questions

Figure 19: Jacob van den Borne (Photo Credit: Jacob Van den Borne)

In 2006, Jacob van den Borne came home to farm with his father and brother in the south of the Netherlands, near the Belgium border. As a tech advocate and leader in his field, he has a drive to add value to their potato farm by using precision technology (since 2006) and precision farming[8] (since 2009).

Currently, he is one of the few farmers in the world to be fully digitalized[9], while still getting his hands dirty in the fields. He is recognized for his ability to collect the right data consistently and accurately over a long period of time and 20 years of this has enabled him to make better decisions and grow faster than his competitors.

In 2020, he split ways with his brother to pursue his twin passions: high-tech strategy, and potato farming. Today, he speaks to crowds around the world about the benefits of data capture, soil health and technology on farms.

"You have to keep up to keep ahead" - Vangelis Vitalis (March 2023)

Jacob's definition of precision farming? Right time, right location, right thing. For him, the risk of not capturing the data necessary to make the right decisions is that each generation is "getting stupider". In the past, our forefathers would walk the fields. Today, farms are too big. So, Jacob uses sensors to measure biomass and chlorophyll which he can correlate to nutrients and sends this information to his computer. He is then able to make a short list of his good and

[8] The National Research Council defines precision farming as ""the application of modern information technologies to provide, process and analyze multisource data of high spatial and temporal resolution for decision making and operations in the management of crop production" (Fuglie, 2016).

[9] To clarify, the words 'digitize' and 'digitalize' are sometimes confused but they describe two very different processes. Digitizing means simply to convert data into a digital format (think of uploading old photographs to your Instagram account), whereas to digitalize a business "refers to its digital transformation with the help of technology and data" (Estrellado, 2023), which is what Jacob van den Borne is committed to doing on his farm.

bad fields, and work toward his goal to make them better, by adding satellite and drone information he has gathered.

He sees precision ag as a time-honoured risk management strategy: “Precision ag is not new. My grandfather kept a journal each day for the purpose of learning. This was his crop registration. We don't do this anymore. Why? We still need the information, but we are not learning the same way that we used to. Generations are getting stupider. The ‘why’ question is never answered. It’s scary to think about it.”

Jacob is bucking that trend. When trying a new product, he always leaves one plot unchanged so that he can see the difference. He uses UAV (unmanned aerial vehicle, more commonly known as a “drone”) and thermal sensing to determine where fertilizer is needed and when spray is needed. He has identified 16 steps in the growing of potatoes, each one focused on realizing the potential of the land, at a crop, zone, field and farm level. But his data collection doesn’t stop there. He also measures the yield from every square metre and uses cameras on the harvest machine to determine the quality characteristics of the potatoes, such as size, starch, length, weight, etc.. He can trace each potato from a specific area of a field to within a half a meter of storage.

Figure 20: Precision-Harvested Potatoes (Photo Credit: Jacob van den Borne)

I’ve never met a farmer who takes 16 steps to grow a crop and is so passionate about the science behind plants and the data produced in growing them. But accuracy is Jacob’s laser focus, and he does it extremely well. He has even developed new apps where there are none to meet his needs on farm. For example, when he used to map his fields, Jacob found that the technology he was using didn’t capture enough data: it only captured what did or did not work. That “yes or no” level of detail wasn’t sufficient for him, so he added an app that allows him to put a happy, neutral, or sad face on each process used for each farm.

As he learns about new technologies and acquires more knowledge, he integrates that into how he farms. He was initially skeptical of soil scanning. Now, he talks enthusiastically about the importance of measuring the conductivity of soils, like a battery, and knowing this information

for all farms, both owned and rented. He maps this data in 3D instead of taking soil samples and getting an average for the whole farm. When he became more aware of the detrimental effects of compaction, he established tramlines in his fields to minimize where equipment will drive, contributing to 7% more yield. When he saw the importance of drones, he got all the necessary permits to start an airport, so companies that want to fly drones have to go there to do it. Having seen the positive effects of putting data to work on the farm, Jacob stresses the need for data driven farming. He has seen huge improvements by spreading split manure on his soils, rather than chemical fertilizers that kill the soil. He has seen similar benefits with soil cultivation. As he says, "Without animal manure we are going back to the stone age. Without manure, I have what I got back when I started farming: forest land. Dead soils."

Another practice he has adopted is measuring fuel consumption. He explains, “We need to have proof that this practice actually improves the soil so that we can convince the politicians that we are right. We have to have data driven farming. We have to know why we are doing things. Once you start precision farming, you will see that you don’t know shit. Farmers don’t like to see this and then they say it doesn’t work. We don’t admit that we have to change. No one wants to change. We HAVE to change”. Jacob knows, because he measures everything, that his yield has dropped over the past 10 years because of government regulations. He points out that in the future artificial intelligence (AI) will likely replace much of the work that crop advisors now do, but that is only part of the picture. “We have to ask clever questions” he says, “because we created that intelligence, and AI can only be as smart as we are.” The huge biodiversity of different regions, soils, and ecosystems mean that we need to ask a wide range of questions that relate to those diverse conditions. The future of farming using AI won’t be “one AI that fits everything”. The data have to be as diverse as the land.

Jacob has the data now, but most farmers don't. Changing that is something he is especially passionate about. As he speaks to young people, he looks them in the eyes and says “Collect data. Look at crops and collect info on plants also. Young people need to know how to question the right things. ASK QUESTIONS!!! Never stop learning! The only way to be a farmer of the future is to ask the right questions.”

Figure 21: Using and testing drone technology (Photo Credit: Jacob van den Borne)

Jacob is an excellent teacher, and his goal is to start a school on the farm, one where people in government, industry, farmers, and the public can come to the farm, visit his boardroom, and ask questions. I don't doubt that he will. He has already started a Precision Academy, an online program offered in three languages, that teaches students the basics. Participating students then have the opportunity to come to the farm each year for six years, to get their hands dirty and try it all in person. In addition to being a teacher, Jacob is also a Precision Coach, in which he focuses on getting people to ask the right questions.

In 2022, he welcomed 600 visitors, over only two days, to his farm to share his practical knowledge. Jacob also has a trialling company to help suppliers see if their product is good. He offers a soil scan and plot plan service to farmers so they can get a really good map and see where there is balance in the soils.

I asked him what he thinks is his biggest risk. He replied that it is the government, hands down. As he explains, "I can do tech, grow crops, meet potential but now I am not allowed." For ten years, he increased his yields by 1% per year. Now, the government won't allow him to use fertilizers and irrigate in areas where the data show real potential, and as a direct consequence of that, the yield is dropping again. He can see these consequences clearly because he has collected the data to prove it. But he recognizes that many farmers are experiencing the consequences of government decisions that are out of step with farming innovations (like his) that are happening on the ground and being tested in real time. Those consequences have a much broader impact. As he stresses, this is a global issue: "This is something that we need to rethink because the consequences are great."

Jacob also thinks about external risks: global issues, war and conflict, migration and world hunger to name a few. As a "big picture" farmer, he sees these external risks to food security as part of the "risk map" he uses to plot his course, so to speak. The decisions he makes on his farm are informed by more than just the data he collects on his farm. He pays close attention to what is happening in the wider world, nationally and internationally, and he has strong opinions based on his own experiences of political events.

Rather than being daunted by the challenges he encounters, this motivates Jacob. "I don't want to be bigger. I want to be better." He wants government policy that is based on the kind of data and science that he is doing himself, instead of being restricted (often for illogical reasons) by government policies from innovating by using real data to produce more with less.

3.5 Local Risk Management Analysis: Tying it All Together

Introduction

Farmers around the world have many things in common. They are connected to the land, they have a passion for the food they produce, whether for the livestock they love or the thrill of watching a crop grow in the field, and they have drive and purpose. The farmers I met were excited about their businesses. Day in and day out, they work hard on what I call the "three prongs of sustainability" – providing safe and healthy food to people, incorporating environmentally friendly practices, and trying to remain profitable (because, without that, you simply can't farm). Farmers work to differentiate themselves, innovate, incorporate technology, and grow their businesses. Each of those aspects of farming involve risk, everyday.

When I started my Nuffield scholarship, I was on a search for creative and innovative ways to mitigate risk. I specifically sought out farms that were suggested to me for their progressive approach and outstanding success, rather than visiting farms that were representative of the average. Specifically, I was looking for technical risk management strategies that farmers had put in place on-farm, and I saw that in abundance. In every country, on every farm that I visited, farmers had thought about risk management. As someone who has been involved with Farm Management Canada, taken numerous farm management courses, and worked hard to reduce risk in every way possible on my farm, I expected to see farmers with written business plans and a few BRM strategies that stood out as exemplary, something that I could write home about. In actuality, I found over 60 farmers with over 60 different approaches and maps to success. I was also able to uncover a few nuggets that could be transformative in the world of agricultural risk management and the way in which farmers, industry and government tackle that challenge.

Preventable Risk at a Local Level

I started each conversation by asking farmers what risk management meant to them. Surprisingly, I was met with a far more diverse range of thoughts and ideas than I had anticipated. To some, risk management focused on the actions that were within their control, or, as stated in the risk overview, preventable risks. Although risk management is an area that takes a lot of time to consider, implement and follow through on, I saw many, many best practices and I took note of them.

In Australia, where drought is inevitable, farmers told me about storing feed, some in bunkers, but one farmer told me how he had hired in an excavator, dug a huge trench, and filled it with feed when it was plentiful. He then covered it up with dirt and was prepared for the next drought when the grass would stop growing and farmers couldn't feed their animals. For this farmer, this practice changed his drought plan, since he knew that come the next drought, he would have additional income by selling feed, and a way to feed his own animals when others could not.

In Canada, Kristjan Hebert told me his story of coming home to the farm in 2004 and growing it, together with his father, from 2500 acres to 28,000 acres in just 16 years. His experience working for an accounting firm and learning to crunch the numbers to create valuable data played a huge role in his ability to grow the farm. Kristjan is always thinking five steps ahead, working to ensure that he has the right people around him to support growth and prosperity. He is focused on margin, ensuring that he is financially protected before his crop even goes into the ground. He uses both provincial crop insurance and private insurance through Global Ag Risk Solutions (GARS)[10]. Private insurance allows him to purchase additional insurance to cover his primary costs and the farm's gross margin. He knows the value of relationships and has built his team like a hockey team, with captains and assistants who can empower the team but who don't get more ice time. Kristjan also relies on his advisory board and his network to help him to make decisions. His philosophy can be summed up with what could be his motto: "Can't isn't an option, only a challenge."

Many, like the farmers above, had a very good handle on all five pillars of risk management: marketing, economics, production, leadership and strategy. Often, farmers spoke about farm financial resilience and the ways in which they worked on budgeting, cash flows with pressure tests, determining their financial ratios and putting them to use through thorough understanding, questioning, and creating data from years of financial results. Livestock farmers always told me about the importance of biosecurity and how that had to be a priority on their farm, which often led to conversations about external risks like African Swine Fever. Inflation, interest and debt were also common themes, given the substantial changes that we've seen in these areas over the past few years.

We saw in Cissi Klasson's case study how she put the five pillars of risk management into use to better her farm on many fronts, differentiating herself from other farmers in Sweden and earning her the recognition by both her banker and her accountant as one of the top farmers in the country. Just recently, I touched base with her for an update. Her husband is buying out her business angel and they are incredibly excited about what the future holds. She told me "Buying out my business angel is not the end; it is just the beginning." She has many strategic plans for the next couple of years and feels more confident moving forward with the many preventable risk mitigation strategies that she has put in place.

Annechien ten Have, a pork producer in the Netherlands, agrees with the foundational work that the five pillars add to a farm. She stresses the importance of strong production and a clear understanding of your financials stating, "You need to have financials and production in place and on a solid footing before you can think about other types of risk management."

[10] Global Ag Risk Solutions (GARS) is the Managing General Agent for Aviva Canada Inc. whose flagship product (among several other insurance products) is whole-farm insurance. In this context, the GARS program allows Hebert to add insurability to his crops and meet the CAP before planting.

Strategic Risks at a Local Level

As we saw in the Overview, strategic risks are risks that need to be addressed differently than preventable risks. These are the ones where we need to evaluate the risk vs. the reward. In the corporate world, this can cause a lot of stress. In the farming world, while it can be stressful, I watched farmers light up talking about it. Preventable risks mean paperwork and that isn't generally the strong suit of many farmers. Strategic risks, however, are often action oriented and farmers are all about action! These decisions aren't easy, to be sure, but I found that farmers were often excited when they thought about new business opportunities or buying land or equipment. Where these strategic risks can become more challenging is when a decision needs to be made that requires a major change.

In France, Gregoire Ferre spoke of the challenges of being a grain farmer, a price-taker, as grain is a price that is determined globally depending on supply and demand. Gregoire says, "I knew I couldn't pay my bills by only cropping." He chose to take a different path, to diversify and focus on a direct-to-consumer approach, with a goal to set the price for the products he sells. He knew that marketing was the key and learned how to make cider (absolutely delicious cider) and opened La Maison Ferre, an organic apple cidery, opening an on-farm store and selling at local farmers markets. It wasn't an automatic payback, and he certainly needed a vision, a business plan, and determination, but he started by using the apples on his farm for cider and has since created a demand for his product and diversified into selling pear cider as well. Gregoire constantly evaluates profit in every decision that he makes, challenging himself to make every square foot of land add value to the bottom line of his farm. Fire is his biggest risk, and he ensures that he has two locations for barrel storage so that he always has product. Gregoire has travelled the world to better understand his business and to think about his next steps, which has led to the distillery business, and other farm improvements.

Local Management of External Risks

All farmers, though, seem to struggle more and more with the idea of the "big and scary" events that can come out of the blue and cause major disruptions on the farm and to the bottom line. COVID-19 is a perfect example of an event that can last for months and even years, causing irreversible harm to farm businesses. In Canada, the pandemic came in waves, with severe restrictions including mask mandates, the shut down of schools, businesses, and restaurants, causing a ripple effect that disrupted supply chains, and created logistical nightmares. It was an extremely difficult, if not impossible, challenge to try and bring in the international workers that are necessary on many farms. Each of these disruptors impacted farmers in a multitude of ways, causing shock after shock to the farmers in Canada and across the world. The result? A farming community that saw stress levels increase dramatically during the pandemic. Stress, anxiety, depression, emotional exhaustion, suicide ideation, and lowered resilience were all higher among farmers than the Canadian national average (Jones-Bitton, 2022).

It is obvious that there is a correlation between the effects of external risks and mental health. So, is it any wonder that farmers have a hard time coming up with a plan to mitigate the risk associated with these types of risk? It is hardest, by far, for farmers and businesses to get their head around risks they have no control over. When farmers told me they didn't have a written business plan, they often told me it was because of the external risks and the fact that they very quickly became overwhelmed. You'll recall Jan from Kuijpers Kip and his sentiments, "Having a risk management plan doesn't work. There are more risks in the market now. We had a plan but there are new things happening: energy and gas are up [because of] the war. It's very difficult to make a risk management plan because every week the risks change, which makes it very difficult to make the right decision in the moment." Jan is not alone. In fact, in almost every interview, farmers shared similar thoughts.

Risk management is painful, and not a natural act for humans to perform (Kaplan & Mikes, 2012). We've talked about utilizing a compliance or rules-based approach for preventable risks earlier, but Kaplan and Mikes recommend one of three options that to address strategic and external risks: an independent expert who can to challenge a company's risk review board in their thinking, a facilitator to bring together a relatively small group of managers from different working groups across the company to discuss risk management, or embedded experts within the organization to continuously monitor and influence the business's risk profile, working side-by-side with line managers (Kaplan & Mikes, 2012). These recommendations, however, are more applicable to large corporations than they are to farmers.

As described in the Overview, farmers don't often have large teams. The horticulture sector in Canada hires the largest number of employees per farm at an average of 25.3, with more than half of the employees in the agriculture sector being seasonal employees (Statistics Canada, 2023). Many of the farmers I spoke to had 10 employees or less and often the farmer was the primary decision maker. In cases like this, it's hard to implement the options presented in the paragraph above to mitigate strategic or external risks.

Herein lies the problem. Experts recommend constructive and confrontational meetings to discuss risk within a company on a regular basis that include managers from within the team, but this isn't implementable on a farm with only a few employees or mostly seasonal workers. This means that farmers are left to think about the big and scary risks primarily on their own (on top of the marketing, finance, production, strategy and leadership decisions that they need to make each day). Is it any wonder that 76% of farmers said they were currently experiencing moderate or high perceived stress? (Jones-Bitton, 2022)

Adding to this is the reality that farmers generally find their life purpose in their farm, and this piles on additional weight to the uncontrolled stress associated with external risks.

But there are options. Farmers are creative and innovative. Dave Gooden's utilization of a business consultant introduces the idea of using an "expert" and because the consultant sits down with the owners twice a year, there are opportunities to discuss risks, the big, the bad

and the ugly and work through potential options for mitigation. Peer to peer networks enhance connectivity with other producers. Advisors can effectively help them to better understand the risks associated with their business and the tools available to manage them. As I saw with Simon Turnball, this means being able to have a plan in place that is ready to implement. We have access to many experts, agronomists, experts in our industry, and more. We also have each other.

Annechien ten Have, a farmer I spoke with in the Netherlands (July 2022) talked about collaboration as a risk management strategy. In situations where she was not able to buy land or the parcel was too big, she looked for other investors to work with and find win-win situations.

Peer groups could offer many advantages if they made risk management a regular agenda item for their get-togethers. Some peer groups come with a large price tag, but there are options for farmers to bring together a group of farmers who share a desire to learn from each other.

Gerard, from France, is a huge advocate of peer groups. He has been involved in a peer group made up of pig farmers from throughout the EU called EPP (European Union Pork Producers) for a number of years. EPP started with12 farmers who came together regularly to share data, talk about what is working and not working on their farms, share new ideas, and travel together to look at new and interesting things. “We keep it fun and we learn from each other.” Not only is it a way to constantly strive for more, but they are no longer alone in their work, and they can support and learn from each other.

Cooperatives and Collaborative Farming

Collaborative farming, as we saw with the Gooden brothers, also referred to as shared farming, is a structure that provides many benefits, primarily scale and size, while maintaining independence. As farming becomes more capital intensive, this may be an area that deserves more attention in the future, allowing farmers to work together and grow their operations while becoming more profitable.

PEER GROUP LEARNING IN QUEBEC

Since 1968, Quebec farmers have organized into "syndicats de gestion agricole", or farm management clubs, in which 20-40 farmers associated to hire a farm management specialist to advise them on the management aspects of their operations. In particular, this involved benchmarking and financial management.

A provincial federation was formed in 1982 (which is now known as Les Groupes conseils agricoles du Quebec (GCAQ) to provide centralized support to each individual group. Although these organizations do not offer courses per se, they have collaborated in a wide range of learning activities as part of their primary advisory role.

Similarly, the Centre Regional d'Etablissement en Agriculture (CREA) was created in 1990 to support the farm transfer process and other human dimensions of farming operations.

Similar group learning business models have been used successfully in Australia and New Zealand.

In Australia, the climate can be incredibly difficult, especially when you farm in an area with low rainfall on sand dunes.

A fellow Nuffield scholar talking about collaborative farming told me about two farmers in Victoria (Australia) who realized that their 10,000 acre farms simply were not profitable. They began to investigate the opportunities that could come from changing their structure and working together. They determined that 20,000 acres was the most economic business unit, so they decided to work together: putting their land into a trust and starting a new corporation. Each of them sold all of their used equipment and bought new equipment under the corporation. Not only did they become profitable, but they each found that they had more time and, for the first time ever, were able to take holidays.

Cooperatives are a model that have been utilized for years, allowing farmers to remain independent in ownership of their farm, with a goal to take advantage of selling at scale and increase the returns for the farmers who have chosen to be a part of the association. They are certainly not always successful, but, with the right focus and leadership, can provide many benefits to the farmers, the industry and the government. In Norway, Kari Signe Lysne is a woman with incredible foresight when it comes to business. She recognizes the challenges associated with farming in a country that is made up of more than 50% mountains and on very small farms, farms that average only 22 hectares, with many fields being only 3-5 hectares or less and brought farmers together to form a cooperative. Cooperatives in Norway have a dominant market position and generally have long-term contracts with retailers, Kari shared with me. Leading the cooperative is hard work, trying to satisfy the many needs of the farmers and working with the retailers, but Kari believes this is the way for farmers to remain profitable in Norway.

Cooperatives can be a huge advantage to farmers as they work together to find efficiencies. Arla Foods in Denmark, and Coren in Spain, were brought up many times in my conversations as examples of well-run cooperatives. One executive told me that “Good co-ops have strong leadership and management and don’t allow the farmer boards to make all of the decisions on how to move forward.” This is key. He went on to say that structure makes or breaks a cooperative. “Farmer advisory boards need a management board above them.”

In New Zealand, I had the opportunity to sit with Neil Beaumont, CFO of Fonterra Dairy, and a Canadian. Fonterra, developed 22 years ago, is the world’s 3rd-4th largest dairy cooperative and the largest in New Zealand, representing 9000 dairy farmers across the country. Fonterra’s purpose is to secure the highest possible returns for their farmers while maintaining their commitment to sustainability and their communities. “The success of the dairy industry is relatively healthy. Where industry fails, cooperatives go away” Neil says. The dairy industry in New Zealand has been more successful than the dairy industry in Australia, and Neil attributes this to their strength as a co-op, the option to participate, and regulations requiring that all milk produced be picked up. One of the challenges that they have faced, however, is determining their reason for being - a lack of clarity of purpose, strategy, and direction in capital management - similar to other cooperative challenges that I was told about in France.

Being part of a cooperative certainly doesn't mean that the farmers will be profitable all the time. Neil tells me that in 2016 they paid an average of $3.90, but the average cost of production was $4.20. The entire industry lost money. Many farmers have a good understanding of risk in New Zealand, Neil says, but like any industry, there is variability. The better farmers realize that in an industry with highly volatile inputs and outputs, you have to have scale as it helps you to be lower on the cost scale. They think thoughtfully about their debt levels to ensure flexibility and the ability to invest and ride out volatility. Neil says, "There is no one-size-fits-all when it comes to risk. Some farmers focus on being low-cost while others are willing to pay more if they believe that there is a trade-off. In New Zealand, pasture management is the key differentiator. Perhaps the biggest decision you make when you are thinking about risk management is thinking about the time horizon. Good [farmers] are really good at thinking about the long term and the very long term. Ag has not done a good job of this." He goes on to say that "when you are fighting for survival, you don't have the luxury of thinking long term. You just do what you have to do."

There are many risk advantages to being a part of a cooperative. It allows farmers to focus on what they are good at, production, and allows other experts to focus on processing and sales. It also brings farmers together, giving them a sense of belonging to a bigger team.

Climate Change and Local Management of External Risk

Climate change is a hot topic in New Zealand as well, and on a national level, Fonterra has been working closely with government on behalf of farmers, to find a way to move forward together. This is a classic example of an external risk, a risk that arises outside of a farm, that has the potential to have an economic impact. External risks are the risks that, as I observed over and over again, businesses tend to struggle with most, and their owners struggle with too. It is these risks that can't be forecasted with any assuredness and are therefore difficult to reduce. Despite this, I encountered many farmers who had successfully faced adversity that was outside their control.

Hew Dalrymple is a diversified farmer from the North Island of New Zealand. As I jumped into his pickup truck, Hew proceeded to tell me his farming story, one of great success built on mitigating risk, overcoming challenges, and filled with grit and determination. Hew and his brother farm together and they have an incredible story about finding ways to add value to everything they do. As he showed me around, he could tell me the numbers associated with every part of the business. He certainly had a good handle on the finances. They've focused on growing high-value horticultural crops such as cabbage, broccoli, caulilini[11], broccolini, and kale. They have concentrated on ensuring that their process is excellent, providing exceptional product to the market. This gives them an advantage with processors who desire their product. With the ability to grow so many products with high quality and at scale, they are able to shift to take advantage of the best contracts available.

[11] Caulilini is an Asian-style variety of cauliflower with stalks that are more tender and a sweeter taste.

Hew and his brother have also taken advantage of the New Zealand emissions trading scheme and planted 380 hectares of forest for additional income, logging trees each year. The advantage of trees, Hew says, is that you don't have to sell them quickly. They are ready to harvest by between 22-35 years after planting and can provide additional income in challenging years if necessary. They had the foresight to see the direction that the world was going in regard to climate change and were proactive in utilizing and planting a forest, mitigating a potential external risk that has now come home to roost.

The Dalrymple brothers have also been quarantining stock prior to being exported, ensuring that the animals are well cared for and all regulations are met, which provides them with an important source of revenue. Recent government legislation to ban live cattle exports has, however, put an immediate end to this part of their business – another external risk. Although it is unfortunate and not ideal, their business is able to withstand these kinds of unforeseen circumstances because they are diversified in many areas and the end of one revenue source is not the demise of the business.

Hew is not a fan of government and is quick to identify government as the farm's biggest risk, citing government interference with business as a big challenge. "One change of policy and a revenue stream is immediately gone." Hew goes on to talk about how the decision to ban cattle exports was made to appease the public, and was based on emotion and perception, rather than facts and science.

Jacob van den Borne and Kuijpers Kip also see the government as an external risk, the biggest risk on their farms, as seen in the case studies. Each of them have been proactive in diversifying, honing in on data capture and technology to add to the value of their farm. It is obvious that they consider the external risks to their farm by looking at what is happening globally and each of them has stepped out ahead of their industry peers in making changes to advance environmental sustainability.

Gender and Risk Management

When we take gender into consideration, risk management becomes even more interesting. According to Michele Wucker, former think tank executive turned author, men may be more likely to engage in risky behaviours than women, and women are, generally, more risk averse. Women may also weigh factors more thoroughly and be more prepared. In her book *You Are What You Risk: The New Art and Science of Navigating an Uncertain World* (2021), Wucker writes "It's time to pay attention to the clear and growing body of evidence that women are better at managing risk … when it comes to gender differences in approaching risk, that's the biggest one I've seen: men are more likely to pretend that problems simply will not occur." (Wucker, 2021, as cited in Michelson, 2021).

In her book, Wucker cites work by Q. Ethan McCallum, a United States author, researcher and consultant, who writes that "women are more likely than men to seek outside expert advice on areas outside of their expertise as a smart risk-mitigation strategy to head off both known and

unknown dangers." Seeking that expert advice, Q. McCallum says, is key (Wucker, as cited in Michelson, 2021).

Cissi, a hog farmer from Sweden certainly had a different approach to her business than the male farmers that I spoke to. From the very beginning, she was quick to reach out to her networks for advice in areas that she was unsure of. It was through her network that she built the confidence to go with a business angel. Cissi was detail-oriented, documenting everything in her business and paying close attention to the risks. I originally thought it was only because she didn't grow up on a hog farm and because she had a desire to make her farm work that she paid so much attention to detail. Now, I also think that her gender worked to her advantage.

There are more women in agriculture than there were even 15 years ago, and we need to recognize, respect and tap into the skill set women can offer in terms of mitigating risk.

Final Thoughts

Managing risk can involve very different approaches: risk management in general focuses on the negatives, while strategic risk tends to focus on the positives. Many leaders have a tendency to discount the future and are reluctant to spend money to avoid an uncertain future problem that "might" occur down the road. In my case studies on local risk management, however, I found that farmers were looking to the future and putting time and resources into environmental sustainability, technology and innovative business practices, to reduce risk. This appears to be a benefit to farmers and makes it clear that they are individuals who are constantly looking to the future and doing what they can to mitigate risk, even if they don't have a written risk management strategy.

4.0 CASE STUDIES: GOVERNMENT RISK MANAGEMENT

4.1 The Power of People vs. People in Power: Managing Risk in Zimbabwe

In Zimbabwe, there is a long history of legislation[12] which was designed to take power away from the people, and every government in power since has acted in its own interests, power and money, rather than in the interests of the people. This has made the government the biggest risk factor in Zimbabwe, for the black majority population, and for the white minority population.

Ultimately, this "democracy in name only" method of governing has only increased the risks for all Zimbabweans, black and white. Many farmers I spoke with in Zimbabwe have no confidence in the way people are governed, or in regulations for business and agriculture.

[12] It's hard to know where to "begin" in a story that is thousands of years old. After the British invaded the Shona and Ndebele lands in 1895, they enacted an apartheid land redistribution policy. In 1930, the government passed the Land Apportionment Act, which set aside 17.5 million acres of land for colonial Europeans. In 1951, the Native Land Husbandry Act was enacted, which made it illegal for Africans to own more than five head of cattle or own more than eight acres of land. Anything over these imposed limits had to be immediately sold off to white commercial farmers.

Throughout the 1960's, African people (including farmers) organized, and movements flourished. even though, at that time, 80% of the arable land was owned by a white minority who made up less than one half a percent of the country's population. Even so, many white Zimbabweans supported a peaceful transition to democracy, and full enfranchisement of the black majority. However, in 1964, Ian Smith's Rhodesian Front party came to power on the promise of permanent minority white rule, and the year after, Rhodesia unilaterally declared its independence from Britain, a move that led to sanctions by Britain and the United Nations.

My hope is that by focusing on the risks inherent in a government that does not listen to its people, this case study emphasizes the importance of a stable democracy, and a government that listens to the people it represents, in mitigating broad risks to all sectors, including agriculture.

Even so, I can't begin to address the complexities of this country's history, particularly its racial tensions, especially as a female white Canadian farmer whose visit to Zimbabwe was mostly limited to speaking with white farmers[13]. This case study is primarily about their stories, beginning with my experiences visiting Red Dane Dairy.

Red Dane Dairy

Red Dane Dairy, now owned by Ajs Kirk, was established over 40 years ago by Ajs' father, Wolle Kirk, in Harare South, Zimbabwe. They started with about 100 Friesland-type cows and have grown significantly since that time. Their farm, however, did not escape the brutality of land reform. Ajs recalls how his family was violently attacked in 2002, including his father, who lost his left eye after being stabbed. They escaped Zimbabwe, returning to Denmark, grateful for the Danish passport they still held.

The Danish government worked with the Zimbabwean government to have some of their land returned, but they would not return the irrigated acres. Although Ajs was offered a 99-year lease, he never received it. Legally, he should have title but the land deed he holds reads "Not Valid". In reality, the government owns his land.

LAND AND AGRICULTURAL LEGISLATION IN MUGABE'S ZIMBABWE

In 1980, Mugabe took power after a bloody war that ended with the signing of the Lancaster House Agreement, spelling the end of white minority rule, and a new constitution for Zimbabwe. He would eventually be ousted by his own people in a coup celebrated by millions of Zimbabweans, but in the first few years, the economy was doing well, and infrastructure was being built and expanded. Post-independence, he made a speech that promised the end of oppression, saying "The wrongs of the past must stand forgiven and forgotten. If we ever look to the past, let us do so for the lesson the past has taught us, namely that oppression and racism are inequalities that must never find scope in our political and social system. It could never be a correct justification that because the whites oppressed us yesterday when they had power, the blacks must oppress them today because they have power" (April, 1980). But it was a false promise. Mugabe's reign of terror would soon destabilize the country's economy by striking at the heart of its economy: agriculture.

Prior to the mass seizures of white-owned farms, Mugabe used the Unlawful Organisations Act in 1983 to seize the land and property of his political rivals, the same legislation that Ian Smith's party had used to arrest over 500 black political leaders, and confiscate their land, in 1959. The faces in power had changed, but the tactics of oppression had not.

(cont'd on pg. 52)

[13] Names and identifying details have been changed to protect the safety of some interviewees.

There are currently 280 commercial dairy farms in Zimbabwe, a number which includes farmers with five cows or more. Despite the prioritization of dairy farming during land reform, there were 260 million litres of milk produced prior to land reform, and only 21 million litres produced in 2021. Dairy farming in Zimbabwe is not an easy business.

Figure 22: A bush dairy at Red Dane Dairy contributes to soil regeneration (Photo Credit: Amy Cronin)

On Red Dane, as on other Zimbabwean farms, cows are utilized for high grazing intensity and regenerative agriculture. When we were there, we toured their "bush dairy", and saw how the milking parlour goes to the cows in the fields rather than the cows coming to the parlour. This practice allows for intensive grazing, moving animals as necessary and ensuring that the grass is well maintained to provide feed for animals.

Red Dane started playing with the idea of a bush dairy system 20 years ago. The land was bare when they arrived and through intensive impact grazing and regenerative agriculture, they have been able to cover the land with thick grass and a multitude of species, reducing the risk of feed shortages and ensuring sustainability for the future.

Red Dane is, and has had to be, extremely innovative, and they are always looking at new ways to farm in Zimbabwe. It may sound ironic to someone in the first world, where we are bombarded with messages that cows are "ruining the planet" but in Zimbabwe, more and more of the land is turning to desert and an important part of sustainable land management is intensive livestock.

In Zimbabwe, where land management has become a priority for innovative farmers, there is a keen awareness of the "desertification" of Zimbabwe's grassland ecosystem, and sustainability practices are essential. Our visits to the Allan Savory Institute (an NGO that works with farmers on holistic management) Red Dane Dairy, and many others, made it apparent that high impact intensive agriculture was making a positive difference in bringing life back into the soils and reversing the desert effect.

However, a worsening economy threatens this progress. In many parts of Zimbabwe, poverty forces local people to risk trespassing to cut trees for firewood, and there is a practice of burning long grass at the end of the season, which increases soil erosion and degradation, increases the risk of wildfires, and worsens the effects of drought (Kadungure, 2016). Progressive farmers are working to plant trees, stop the practice of burning grass, and introduce high impact intensive livestock farming to increase sustainability in Zimbabwe. Education for small-holder farmers is underway, with hopes to increase the viability and productivity of the land.

Figure 23: Our Nuffield group touring Kefalos in Zimbabwe (Photo Credit: Amy Cronin)

In desperate economic times theft is prevalent and anything that isn't tied down is gone the next day. Generators, fencing, trees and even cows are stolen without guards and constant vigilance. Red Dane ensures that their employees are well compensated, and provide locally relevant benefits such as maize, housing, and education for children. Employees are not only helping to run the dairy farm, they are tasked with protecting farm assets from theft.

Ajs says that he has built his farm by focusing on production and adding value as much as possible. "It is not about what everyone else is doing in Zimbabwe. It's about looking outside, getting new ideas, and always moving for more" (Kirk, 2022).

In 1993, Wolle Kirk purchased Kefalos, a Greek-owned dairy processing plant based out of Harare, to add value to his milk. He now provides high quality milk products to the Zimbabwean market. Kefalos currently holds 85% of the yogurt market share, and 80% of the ice cream market share, and they are the only commercial cheese plant in Zimbabwe. They have grown to the point that they can now support emerging dairy farmers by buying their milk.

Figure 24:Figure 22: Making cheese at Kefalos (Photo Credit: Amy Cronin)

One of Kefalos' most recent innovations includes selling milk in packaging that does not have to be refrigerated, which they estimate will significantly grow their available market. Ajs and his family attribute their success to paying attention to detail, focusing on quality, being enabled through a flat decision-making process, and having a diverse and engaged team. In addition to adding value, he continues to start new businesses, diversify at every opportunity, sell equipment, run a cooperative bush dairy system, invest in solar panels to ensure electrical power, and more.

The Experience of White Farmers in Zimbabwe

White farmers I spoke with talked about how they were violently forced at gunpoint to leave their properties and everything that they owned. Many white owners, black farm management and workers were murdered or seriously hurt by Zimbabwean soldiers or war veterans who, as I heard from survivors, bound unwilling farmers with chains and dragged them down the road. Farmers I talked to felt that this was an example of "what happens when you don't conform".

One local white Zimbabwean told me his own story, one that he vividly remembers from when he was just 15 years old. His dad needed to leave the farm to get some supplies. He handed him the gun, planted him at the front door, and said, "No matter what happens, your only job is to protect your mother and sister."

He remembers being terrified, but the soldiers didn't come that day. They came a couple of months later and everything they owned was taken. The family was given only two hours to gather a few things and get off the land, leaving their home and everything they knew behind. Farmers told me about having land seized that they had purchased and paid for outright, as well as land on which they still had outstanding bank loans.

Regardless, white farmers saw their land and everything on it, taken and redistributed to black Zimbabweans, many of whom were government officials, army officers,

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(cont'd from page 49)

Following this, Mugabe sent in his army which committed "brutal beatings, mass rapings, mass killings, maiming of hundreds of innocent, unarmed, unresisting men, women and children as well as looting and burning of villages and houses" (Nkomo, 1983). 20,000 Ndebele civilians, were murdered in what is now called the Gukurahundi genocide. Forced into exile, Nkomo wrote to Mugabe saying that he believed Mugabe had deceived and cheated "when [he] talked of unity, reconciliation, peace and security" and that his intention was to seize power, destabilize the country, and set up a dictatorship. In 1997, the Zimbabwean government targeted 1,471 white-owned commercial farms for 'resettlement'. These were violent seizures rife with corruption, and were not a regulated process but a reign of terror.

From 1980 to 1998, the Zimbabwean government, through phase one of land reform, purchased 3,498,444 acres from white farmers who voluntarily sold their land on a "willing seller, willing buyer" basis (which accorded with the 1979 Lancaster House Agreement and/or the 1985 Land Acquisition Act). In 2000 the government moved to phase two, a fast-track land reform policy which resulted (by 2011) in 10,816,886 hectares seized from white farmers, without compensation, and often under threat of violence. Farmers tell me that land reform continues to this day.

war veterans and professionals (doctors and lawyers) who didn't have the knowledge or the experience to commercially farm.

These stories are not in isolation. While on an agricultural tour of Zimbabwe, we encountered many people who were violently removed from their homes, their animals beaten to death while they were forced to watch, their buildings and farmland looted and taken, leaving them with nothing, and no place to go. Many farmers and farm employees were beaten up by mobs and some were even killed in this manner. In one court judgment, Lord Justice Stanley (quoting Justice Rix) wrote that:

> "By far the great majority of the victims of the invasions were the black employees of the farmers, who together with their employers suffered extreme physical violence and the loss of their homes and livelihoods, but who could least afford to bear their loss." (SK [Zimbabwe] vs. Secretary of State for the Home Department, 2012)

One day, as we travelled toward Harare after touring a farm, our small bus pulled over to the side of the road, where a lone farmer was out on the land of a once bustling farm, now fallen into disrepair. Our tour guide came onto the bus, and told us this:

> "It has taken me a week of getting to know you before coming to a point where I could tell all of you a part of my story. Look out the window. This is where I grew up. Climbing those hills in search of bushmen[14] paintings and pythons, riding my motorbike, helping my dad on the farm. I had freedom". He paused, drew on his cigarette and took a deep breath. "And one day mobs of people came with machetes and drums beating, yelling and screaming that we needed to leave. The police had set up roadblocks to stop other farmers from helping us extract or stay safe. I was 16 years old. My father was beaten beyond recognition. We had 200 staff that we were very close to and many of them met an equal to worse fate than us. Well, those that never turned their back on us and joined the hundreds of people chanting and looting."

As I took in the scene, my heart broke. It was evident that 20 years ago, this 2000-hectare farm was beautiful and well-kept. Since then, anything of value, like the steel on the roofs and the irrigation pipes, had been stripped away and sold. The house had been left barren, implements had been left, the sign at the road had fallen down. Once-tilled farmland now grew wild, with weeds and trees over six feet tall. Only the farmer was out there on the land, with his hoe, trying to work the soil one stroke at a time. That scene, and what I felt listening to our guide's story, will always be with me.

Farmers who survived land reform have had incredible struggles to overcome psychologically. The events that they experienced are forever etched in their memories and have become a part

[14]To many San people, the term "bushmen" is derogatory. The San people have been in southern Africa for 80,000 years. Their rock art can still be seen throughout southern Africa, on cave walls and rock overhangs.

of them. They told me that for five years now, the government has said that they are going to pay the farmers for the land and assets that were taken from them, but they have seen nothing. There are legal proceedings as farm organizations advocate and negotiate on behalf of commercial white farmers to try to get some financial compensation, but they are facing barrier after barrier in the legal system.

Zimbabwe Today

White farmers I spoke to told me firsthand about the devastating effects of the land reform policy on the Zimbabwean economy: increased hunger and starvation, unimaginable hyperinflation and interest rates, and drastically increased risks associated with operating a business. Outside Zimbabwe, people sometimes assume that these realities are in the past. But even recently, the situation is deteriorating for millions of people.
Over the past 42 years (since land reform started in 1980), inflation rates have varied wildly: from -72% to 557%. At its hyperinflation peak in 2008, Zimbabwe's annual inflation rate shot to 89.7 sextillion (10^21) percent (Hanke, 2017). Overnight, the price for a loaf of bread rose from $2 million to $35 million and at one point, the Reserve Bank of Zimbabwe drastically changed the value of the currency by simply removing nine zeroes from its value (Toscano, 2011).

Figure 25: Beautiful crop of potatoes on a farm where a farmer tries to decide whether or not to invest $1 million in a potato shed that the government can take at any time (Photo Credit: Amy Cronin)

By comparison, in 2022, the inflation rate in Canada was 6.8% (which, for Canada, was a 40 year high), while in Zimbabwe it was 193%. In June 2023, it had risen to a staggering 285% (Statista.com, 2023; Mpofu, 2023).

This has serious implications which complicate every decision that farmers need to make in Zimbabwe. For example, capital decisions are big decisions no matter where you farm in the world. In Zimbabwe, they are even bigger because of the risks imposed by an unstable, untrustworthy government.

One potato farmer explained to me how he was trying to increase the overall value of his potatoes by expanding the season in which he could sell them. In order to do this, he was going to have to invest over $1 million US dollars in a potato shed to be able to store the potatoes and sell them when the supply was low and demand was high.

When I asked how he was going to decide whether to move forward with the project (given the risk of the government coming to take his land and buildings at any time) he simply said, "We might lose everything, or we might lose everything and the

shed." To a Canadian farmer, the thought was unimaginable, but for a farmer in Zimbabwe, this is part of everyday risk.

Figure 26: Peppers are harvested and dried for paprika and food colouring (Photo Credit: Amy Cronin)

The current situation in Zimbabwe introduces even more complex external risks into what is already a challenging venture, on environmental and human levels. For example, water is a scarce commodity in Zimbabwe and farmers have to look at water supply before starting a farm. Steve Crawford, a banana and paprika farmer, told me how Chinese investment in dams on the Zambezi River has created extreme water challenges. Ensuring that he has a crop, however, has become more challenging.

As we stood in his backyard, we looked out over Lake Kariba. The gap between the house and the lake has been growing. With the dam holding water, Mr. Crawford has had to move pipes out 1.5 km to bring the necessary water from the lake to the banana fields. The lake continues to move further away each year, leaving the Crawfords wondering how they will be able to continue to water their crops. They consider themselves lucky, however, to be farming in Zimbabwe at all. Initially the government took their land away, but he was able to lease it back. "In Zimbabwe, paper is nothing. It's all about the relationships."

Figure 27: Irrigation pipes (left) when first installed at the edge of a lake which is now (right) 1.5 kilometres away, due to damming of the Zambezi river (Photo Credit: Amy Cronin)

He is cautious in investing in anything in the property but says that a 99-year lease would help to give him some confidence. Steve also talked about how labour had become an increasingly challenging issue on his farm: "Interest is 286% this year and my employees are becoming increasingly dissatisfied. It's hard to keep them settled down so I started to include some US

dollars in my employee package." He says this is because the US dollar is more stable and helps to lower the risk of inflation.

There are also serious challenges in Zimbabwe when it comes to information access and integrity. Official statistics don't capture the vast majority of transactions and employment that happen informally, and I saw and heard firsthand how the new government is highly invested in showcasing what they want the world to see.

Figure 28: Sadza, a maize porridge, cooks on the fire to feed employees lunch on a local farm (Photo Credit: Amy Cronin)

The reality that I witnessed on the ground in Zimbabwe is very different than the official story: land invasions are still happening as recently as 2021, there is no freedom of speech, and publishing the stories of people who have experienced the unspeakable is punishable by severe violence. Speaking out against the government will land you in jail or worse. When people cannot trust their government to tell the truth, they mistrust the country's economic system by extension, and more and more transactions are pushed into the informal sector. For example, many of the businesses we visited paid their employees at a rate of $3 per day, and also "paid" their employees in food and school fees.

Figure 29: Employees line up to receive their pay at the end of the week on a local farm (Photo Credit: Amy Cronin)

Officially, $3 per day is considered "middle class" but conversations with farmers helped me to understand that this is only because half of the population is unemployed and living in extreme poverty. In reality, $3 per day is a low wage. These farmers told me that they would like to pay their employees more, but they are restricted from doing so by the government, who will penalize and target farmers for paying their employees more because it 'makes the government look bad' (as it would surpass the government's rate of pay).

Countries around the world (including Canada) imposed sanctions on Zimbabwe in response to human rights violations, political violence and a worsening humanitarian situation. To this day, Canada cites these issues, as well as violence directed at political opposition, significant electoral irregularities, and the denial of a peaceful democratic transition, as its reasons for continuing sanctions against Zimbabwe (Government of Canada, 2023).

When the government took the land from the white farmers and drove them off their farms, this left billions of dollars of debt to be accounted for. Today, agriculture is funded by large corporations or third-party investors. I visited one potato and tobacco farmer who recalled how challenging it was to get funding as the banks won't lend to agriculture, given Zimbabwe's political and economic insecurity. He told me that the government holds his land and the 99-year lease has a clause that says that they can take it back at any time. His entire operation, like so much of the Zimbabwean economy, has to run off cash flow. He has the mindset of a typical farmer in Zimbabwe when he says "We take each day as it comes. We don't think about where we are going."

Another farmer told me "We still have a chip on our shoulder and none of us are without emotional baggage. But there is a resurgence of young people, 30 to 40 year-olds, who are bullet proof and passionate. They are the future of agriculture in Zimbabwe" (quote by Zimbabwean farmer, 2022)

> *"It's easy to dwell on the negative experiences and allow it to hold you back from creating new and even better memories. Don't let the past distort your character, only distil it. See the beauty that surrounds you and make the most of what you have and what you had. Even in the bleakest of situations, there is always a humorous side and a triumphant way out"* (Odendaal, 2013).

4.2 Denmark: The Mink Cull of 2020

On November 4, 2020, Knud Vest, a mink farmer in Denmark and the chair of the European Fur Breeders Association, received a call from the Minister of Agriculture. There would be an announcement in two hours to declare the culling of their entire industry. There was no discussion.

Known worldwide as a volatile industry, mink prices can fluctuate substantially, depending on global supply and demand. But in Denmark, mink farmers had built the industry from the ground up: one of the most progressive mink industries in the world, Kopenhagen Fur, a cooperative established in 1930 and owned by Danish mink farmers, had built their reputation on high standards for animal welfare and a "no waste production philosophy". The world's leading fur auction house, they moved 50-70% of the world sales in fur.

Then, in the swell of fear generated by a pandemic, panic arose about the COVID-19 virus mutating in mink populations and potentially affecting the COVID-19 vaccine. The industry was effectively shut down with only two hours' notice. In 10 days, the government of Denmark had forced the killing of 17 million mink. Eight hundred farms were decimated, 6000 jobs vanished, and farmers were left reeling in disbelief and devastation. Two weeks after the announcement to cull the industry, Kopenhagen Fur announced that it had made plans to shut down by 2023. They didn't even have enough pelts to hold an auction.

Figure 30: Photo from Bloomberg News Story "Denmark to Dig up Millions of Dead Mink After Rushed Cull" (December 20 2020) Photographer: Morten Stricker (Photo Credit: AFP/Getty Images

Figure 31: Photo from Bloomberg News Story "Denmark to Dig up Millions of Dead Mink After Rushed Cull" (December 20 2020) Photographer: Morten Stricker (Photo Credit: AFP/Getty Images)

I met Knud at the International Farm Management Association's (IFMA) conference in June 2022. He was a guest speaker who was asked to speak about the mink industry as a case for the impact of political risk and farming. At 76, his life has been dedicated to the mink industry for over fifty years.

He shared how the government said that they would pay a bonus to farmers who eradicated their herds early and how his family and friends stepped up to help, exterminating up to 2600 mink in one day, skinning them, freezing the furs, and sending them later to be auctioned. Farmers who didn't take action were told that "the decision had been made" and police or government officials would come and kill them anyway, and they did. When he relives this experience, it is plain to see that he is filled with heartache.

Desperate farmers tried to meet with government officials to discuss the massive cull but were turned away and told that the government would not meet with them due to restrictions on gatherings. On November 10th, less than a week after the announcement, Denmark's prime minister admitted that the cull she had authorised was illegal. All hell broke loose.

Figure 32: Photo from NBC News "An employee removing dead mink from a chamber after they were gassed on a farm near Naestved, Denmark on Nov. 6, 2020" (December 1 2020) Photographer: Mads Claus Rasmussen / AFP - Getty Images file

Opposition parties called for the resignation of the minister of agriculture, Mogens Jensen, who was quoted as saying, "We have made a mistake. There were no legal grounds to ask the farmers to cull their mink outside the infected zones" (Carstensen, 2020). Meanwhile, farmers who found themselves outside these "infected" zones were hopeful that they would be able to keep their animals and continue farming. Behind the scenes, anti-fur groups rallied to continue with the massive cull. The political mayhem and confusion made a difficult situation even worse.

In an interview with the Danish Broadcasting Corporation, Nicki Lobner (another mink farmer from Denmark who was also forced to exterminate his herd) expressed that it had been a "roller coaster ride, and it's not a nice place to be … one minute we have hopes we can keep some animals because we're in the non-infected zone. The next minute we're told we can't. We simply must find out what we can and cannot do" (Carstensen, 2020).

Two years went by. Farmers met to support one another, with many receiving psychiatry services. The majority of mink farmers simply want to be compensated, so they can close their businesses and move on. Some have already been forced to declare bankruptcy. Others have been forced to simply wait, since if they do anything on the farm, they will not receive any compensation (Vest, 2022).

Two years after the decision, in June 2022, the Danish government finally began the process of putting values on mink farms but still had yet to decide whether mink breeding would be allowed again. Banks were apprehensive about closing on farms since their values had plummeted. Farmers continued to wait.

Knud estimates that it will take three to five years before all farmers are compensated. His farm buildings, stainless steel buildings less than 10 years old, have been valued at approximately €1 million. These days, they hold nothing but outstanding debt. With the watchful patience of a farmer, Knud warns that this is not an isolated story. Five generations of mink farming in a

volatile world market could not have prepared him for how quickly the political winds can shift, in just two hours, illegally devastating an entire industry. Despite everything, he is clear-eyed and resolute: “The government will never do this again. An investigation is being done and information is coming out. It was a bad political move” (Vest, 2022). At the same time, he wants farmers everywhere to be aware of the risk that something like this could happen to them. He points to environmental policies in the Netherlands, the push in Denmark to reduce the number of pigs born per sow, and he is wary of conversations which are aimed at reducing the number of cows in the country.

The real-life story of the mink cull in Denmark is an example of many aspects of risk management gone steeply wrong: the swift and seemingly panic-stricken decision made by the government with no consultation to farmers at all, is an extreme situation of devastation for farmers, for industry, and for millions of mink. Some news reports and commentary have described it as poor “policy” but arguably, the government’s actions were *not* a policy (or a program) at all but were instead a reactive decision in response to a perceived threat, where very little (if any) consideration or planning was present at all. What Knud shared with us at the IFMA conference deserves to be remembered and heeded as a warning about the consequences of reactive decisions made in a context of fear, by those who have the power to impose that decision over people who are given little or no input over the decision-making process.

Although Denmark is known for many positive aspects, including its picturesque lifestyle, this story deviates sharply. For Knud, although life will never be the same, he remains optimistic.

> *“The sun will rise tomorrow. I see opportunities for the future. If I look back, I get sick” -Knud Vest (2022)*

4.3 Protest and Promise in the Netherlands

The Netherlands, known for its low-lying landscape and significant agricultural sector, faces unique challenges in reaching its climate change goals. In an effort to align with the Paris Agreement, enhance sustainability and achieve a substantial reduction in greenhouse gas emissions, the Dutch government recently introduced a series of climate policies targeting agriculture. These measures include incentivizing the adoption of sustainable farming practices,

promoting circular agriculture[15] and imposing stricter regulations on emissions from livestock farming.

While some farmers have transitioned to more sustainable practices voluntarily, others have expressed concerns about the science used to formulate such policies and the financial burden and feasibility of implementation.

Figure 33: Protest Hay Bales in the Netherlands (Photo Credit: Amy Cronin)

All, however, are concerned about the direction of the government and the effect that it will have on agriculture overall and their own individual operations.

When I visited in 2022, the Netherlands witnessed significant protests by farmers who opposed the government's climate policies and specifically the new regulations that had been announced in May of that year. Farmers, and a wide array of supporters, hung national flags upside down throughout the country, in towns and rural areas alike, placed round hay bales with slogans spray painted on them in noticeable areas, and even dumped loads of soil on the freeways to block traffic.

Protests by farmers are ongoing, and on March 11-12 of this year (2023), thousands of protesters descended on The Hague to protest nitrogen emission policies that farm groups say are ineffective, unfair, and were created to address problems they say have been overstated and exaggerated. Farmers held signs that read, "No farmers, no food" and "There is no nitrogen 'problem'" during the peaceful demonstrations, which were organized by the Farmers Defence Force group (Sterling, 2023). These demonstrations were fueled by a lack of communication from the government to its people, and fears of economic hardship and uncertainty regarding the transition to what the government was calling "sustainable farming practices".

[15] This is a term used by the United Nations which they define as focusing on using minimal amounts of external inputs, closing nutrients loops, regenerating soils, and minimizing the impact on the environment (United Nations, 2021).

Just four days later, on March 16th, the farmer-friendly party, BoerBurgerBeweging (BBB) won a major victory in the provincial elections. The election was significant as it strongly influences membership in the Dutch senate. The BBB beat out the incumbent Prime Minister's party and has become the third largest political party in the Netherlands, calling into question the support for climate policies.

I spoke with many people during my travels in the Netherlands but will spotlight two farming families in particular in this case study: Roland van Asten, and Rick and Judith de Vor.

Roland van Asten

Roland van Asten is a shareholder and family member in the Van Asten group of companies. A large part of their business is pig farming in both the Netherlands and in Germany. The Van Astens are keenly aware of their "license to farm" and work hard to ensure that they are good neighbours and citizens. They have invested hundreds of thousands of dollars in technology to reduce emissions.

I was impressed as I toured their 4000-sow operation, neat and tidy, with barely a trace of odor. Air scrubbers have been installed which remove ten times the ammonia, with the heat from the air scrubbers being reclaimed to save on energy costs. They have also installed solar and wind generation on-farm to help with energy, saving the farm thousands of dollars each year.

Even with all his utilization of technology, van Asten claims that the cost of production used to be his biggest risk, especially since last year (2022).

Lately, however, he feels that his biggest risks are government policies associated with the environment and animal welfare. Roland shared that the government has proposed reducing livestock

TWO STAGE BUFFERS

A 'buffer' is a pool of resources (often cash) that are set aside to draw on in the event of unplanned expenses or disruptions to cash flow. These are especially helpful risk mitigation strategies for farmers, who are exposed to external risks all the time. For the Van Asten Group, these three risks completely drained their buffers. So, last November (2022) they regrouped, looked at the reality of the situation and figured out what they needed to rebuild their buffers even stronger than before.

They also decided to take a different approach: a two-stage buffer. They built up a pot of money in the bank, a cash buffer, that could be quickly mobilized and was directly available. But they also set up a second buffer: this was available because they had land that was paid off and if needed, they could go to the bank and borrow money against it. Access would be slower, but this second buffer meant an extra layer of security against risk.

They put their goals in place and were prepared for the rebuilding to take three years, but because prices were extremely good, they rebounded faster than they expected, and they reached their targets by July. Rebuilding took only six months instead of three years.

The topic of 'buffers' doesn't come up very often in the Canadian risk management landscape. But we should be seriously considering this risk mitigation strategy.

numbers by one third (Symons, 2023) mainly due to the nitrogen issue. He says that cows seem to be the target, but pig farmers are giving up due to financial losses in the industry and increased pressure from government.

Figure 34: Photo posted to EuroNews, captioned "The Farmers Defense Force flag, right, and Dutch flags, fly in the wind on an intersection blocked by tractors in The Hague, Netherlands, 19 February 2020" AP Photo. Photographer: Peter DeJong/AP Photo

There are no subsidies for pigs or chickens in the EU but during COVID-19, the Netherlands supported businesses with significant dollars, which was extremely helpful. Now, those dollars are gone and farmers are feeling the pinch. In Belgium, where African Swine Fever (ASF) has hit pig farmers hard, there was no COVID money, and farmers are either selling out or using their equity to stay afloat.

When the pandemic was first declared in March 2020, they (along with the rest of the world) were hit with uncertainty and fear on an unprecedented scale. Then, in September 2020, African Swine Fever was found in Germany and they were hit with the second of a one-two punch. As Roland van Asten describes it, with ASF, "you don't know you have it, till you have it—you don't even know it's coming till you have it". He considers himself lucky since it could have been worse; they were outside the zone set up to control the spread of ASF.

Being faced with two major "unknown unknowns" in one year was one thing. But then in February 2022, Russia invaded Ukraine and their cost of production went through the roof. In the Netherlands, the price of electricity is measured by utility providers in euros per megawatt-hours (MWh). When the Russia/Ukraine war broke out, the price of electricity went from 50 euros per MWh to 400 euros per MWh[16]. How they managed to survive—and even thrive—

[16] If you were to leave a 100 watt light on for one hour, that would use 100 watt-hours. If you left that lightbulb on for 10 hours, that would use one kilowatt-hour (which is 1000 watt-hours). 1000 kilowatt-hours makes one megawatt-hour, or one million watt-hours.

during these incredibly challenging times ties in with a risk mitigation strategy that is used in Australia and New Zealand: buffers (see sidebar on previous page).

The Van Astens think of buffers not only in financial terms but as a concept that can be widely applied: Roland talked about natural buffers (features of the land and human-designed physical buffers) and also about mental buffers. Especially in contexts of high stress and crisis, Roland noted that these could be "very sensitive, you have to consider the capacity of people sitting around the people and in these times, many don't have a lot of their mental buffer left" (van Asten, 2022).

Rick and Judith de Vor

Rick and Judith de Vor own a 120-cow dairy farm in the Netherlands. Judith didn't grow up on a farm and sees things differently than the average farmer. Although she identifies the government as a huge risk for their farm, she is passionate about building the bridge between government and the farming community and recently built an education centre on the farm to do just that. Like every farmer I met, Rick and Judith don't want to reduce the number of animals on their farm. As a member of the Global Farmer Network, Judith is passionate about advocating for farmers and helping elected officials and bureaucrats alike understand farming and the work that farmers do each day for the environment.

Judith says that over half of the agricultural budget is actually going to nature organizations, with only 40% going to agriculture. "Politicians think that agriculture is getting a lot of money. That is why I built the educational centre, to overcome differences between farmers and politicians and urban people, to tell how we grow fields" (de Vor, 2022).

But, as I learned in a recent conversation (de Vor, 2023) the impacts of government regulation have been severe. The de Vors took over their farm in 2011 and started out with a 10-year plan but shifted to a 5-year plan because of the capricious political and market developments.

Over that time, they have already put in place environmental measures that the government is only now focused on such as sustainability and reduced emissions. The EU's Common Agricultural Policy program will not help their farm because its principle remains "more hectares, more funding" and its focus is not on food production, but on sustainability and ecological schemes.

Over the years, the de Vors have explored different scenarios and made choices in accordance with their values as a family and what they saw developing in terms of government policy. For example, the recent policy change to standards of cattle units per hectare means that they can only keep 85 cows instead of 120. The bigger change (both short and long term) is the new manure policy: the government's aim is to improve water quality, and so now, less manure can be applied to the land than before.

What these policy changes mean for the de Vors boils down to a choice between three financially difficult options: First, they can transport the manure they can no longer spread, and also buy artificial fertilizer. Judith estimates this will cost about €30,000 per year. Second, they could also purchase more hectares, but land is scarce and expensive (about €90,000 per hectare) in the Netherlands.

The third options would be to get rid of some cows, which would mean that production (and thus also turnover) would decrease enormously, and the price would have to increase because their barn was built for 120 cows. All options have significant financial consequences, and none are choices the de Vors want to make. Judith says they will go with the first option so they can keep the same number of cows. “We will have a financially hard time with little money left over for us personally.” I asked Judith how they managed through situations like this, and specifically, how they made decisions on how to move forward. She replied to me in an email.

Figure 35: Judith de Vor (Photo Credit: Judith de Vor)

Having a positive mindset, having ideas yourself and taking initiative helps enormously. We do not wait for the government to ask or demand something from us again, we explore for ourselves where the possibilities lie and what gives us energy. Life on the farm in all facets with family, passion, positivity, craftsmanship and people around us, are more important than earning a lot of money.

We follow our heart, are open to new things, seize opportunities and dare to take a risk. Of course, many people come to our farm, such as an accountant, but I see that they are always working on the technical side. While being a farmer should be done with your heart and the soft side. Of course we also have to eat and we want to have a nice life. But our life on the farm is more important than money and that is why we ultimately make choices based on our hearts and the passion we have for the agricultural sector (Personal communication with Judith de Vor, August 2023).

Judith's words are sincere and full of heart and strength. Farmers shouldn't need to sacrifice their own financial sustainability in order to farm. Like artists whose work is often portrayed as inherently satisfying to do, the work farmers do can be romanticized or glorified if it seems to fit a stereotype that is politically advantageous but, like artists, farmers also need to put food on the table, save for retirement, and provide for their families. Farming often is inherently satisfying, but that should never be used to justify implementing policies which make it impossible to be sustainable and successful.

Figure 36: The Educational Centre, De Elihoeve, on the de Vor Farm (Photo Credit: Amy Cronin)

The Bigger Picture

Reducing our reliance on finite resources and using globally recognized sustainable agricultural practices could boost the export of sustainable products and capitalize on the growing global demand for eco-friendly produce. But those actions are not without consequences. Due to the pandemic and the war between Russia and Ukraine, input costs have gone up significantly and have resulted in the cost of food going up substantially.

If we add the additional costs of implementing new sustainable agricultural practices, what will be the unintended consequences? The Netherlands is the second largest exporter of agricultural goods in the world (Office of Agricultural Affairs, 2022) and their aims are ambitious. The Dutch government aims to achieve a 49% reduction in greenhouse gas emissions by 2030 (compared to 1990 levels) while also hoping to position the Netherlands as a leader in sustainable agriculture and foster a positive international image. According to the 2019 Climate Act, they also hope to enhance soil health, improve biodiversity, and create a resilient food system capable of adapting to the changing climate (Government of the Netherlands, 2019). The changes brought about by the Dutch government will undoubtedly impact the sector's overall productivity and profitability. However, farmers' concerns go beyond this. Many of the solutions being advanced focus on issues that the public has

demonstrated concern for, but farmers argue that they are not solutions that will, in fact, have a positive outcome on soil health, animal welfare, or water quality.

The last couple of years have proved especially challenging when it comes to policies set by the government in the Netherlands. For example, manure derogation in the Netherlands is being phased out over three years, as mandated by the EU. About 18,000 farmers in the Netherlands will no longer be able to spread all the manure from their livestock on the land and will need to pay to have the excess removed. This will cost farmers thousands of euros per year to align with the new regulations coming into play. During the phase-out of derogation, an automated system to track movement of slurry in real time will be put into place for the first year and an electronic fertilizer registry must be put in place for 2024 (Bardon, 2022).

The current Prime Minister, Mark Rutte, has stated that he will be halving nitrogen emissions in the Netherlands by 2030. Levels of nitrogen oxides in the country's air and water are currently higher than EU regulations allow (Frost, 2023). Despite many in rural regions acknowledging the significance of the climate crisis, Rutte has been criticized for the sudden announcement of these agriculture plans (Frost, 2023) especially since farmers were not involved in the solution and were surprised to hear of the outcomes.

> *"Over the longer term, the only alternative to risk management is crisis management, and crisis management is much more expensive, time consuming, and embarrassing"*
> -James Lam, Enterprise Risk Management (2003)

To meet the targets set out by the government by 2030, the number of livestock will need to be reduced by one third. One of the biggest challenges faced by farmers is the lack of clarity from the government in how targets will be met, how changes will be made, and how to understand which farms will stay and which will be forced to take a buy-out. In addition, those who remain will face increased financial pressure caused by the transition to sustainable practices and emissions reductions. Farmers are also deeply concerned about the lack of transparency from the government in how farms will be assessed if changes are made. There are also many questions from farmers who have made significant investments towards more sustainable practices, such as biogas and air scrubbers, and whether these will even be recognized by the government. For example, some farmers have faced higher costs associated with infrastructure upgrades, changes in animal feed and decreased production efficiency during the transition phase. This issue is one that we are seeing in other areas of the world as well. As governments grapple to come to terms with their climate change commitments, they seem to have gotten ahead of their electorates, creating concerns and protests. The Netherlands is not the only government that has embarked on a path to combat climate change, and is realizing that agriculture, as well as many other industries, have important roles to play. Each country that I visited had climate change as a high priority but each one was also grappling with how to create policy that is both effective and achievable, while working collaboratively with the agricultural industry in a way that doesn't stifle growth or prosperity.

4.4 Norway: A Climate of Cooperation

Figure 37: Map of Norway and Neighbouring Countries (Photo Credit: Statistics Norway)

Norway is part of Scandinavia, but it is very different from Sweden or Denmark. In Norway, 50% of the country is mountainous and only 3% of the land is arable, with only 30% of this able to grow grain or vegetables (Statistics Norway, 2023). Still, there has been farming in Norway since 4000 BC. Today, there are about 39,000 farmers, with production spread across 40,000 farms. The average size of a farm in Norway is relatively small (22 hectares). When you are hemmed in by mountains, it's hardly possible to go bigger. Over thousands of years, Norwegians have cooperated with the land and with each other, adapting their agricultural economy to the land. Two significant features of that in Norway are subsidization (by the government) and cooperatives (organized by farmers themselves).

Milk and grassfed livestock make up the bulk of the farming economy although there are niche farms and new innovations being introduced, with the goal of growing crops (such as fruit) not traditionally grown in Norway. Farmers in Norway face both advantages and challenges. Water is readily available, most of it straight from mountain streams and safe to drink all over Norway (Winfield, 2022). Being a coastal country, fishing is part of the economic backbone of the country, and the EU's Common Fisheries Policy would be detrimental to the Norwegian fishing industry. With their high Gross National Product (GNP), Norway would also have to pay higher fees than most other member states.

Figure 38: Fresh water is in abundance in Norway with no license necessary to access it for use (Photo Credit: Amy Cronin)

Figure 39: With 50% of Norway covered in mountains, farms are smaller and nestled in the valleys. "If you own land, you own mountain" (Photo Credit: Amy Cronin)

Unlike Sweden and Denmark, Norway is not part of the EU (neither is Iceland), but it is a member of the European Economic Area (EEA), which includes all EU countries, and this ensures that goods, services, capital and people can move freely within its area. Norway is also a member of the European Free Trade Agreement (EFTA), which allows Norway to trade freely with EU countries, Iceland, Liechtenstein, and Switzerland. Norway is also included in the Schengen Area, a border-free zone which allows people to cross its 26 members' borders freely, without border controls. Norway's approach to forming these alliances and agreements have helped put the country in a position where it can afford to be highly self-sufficient in food.

SUMMER FARMING

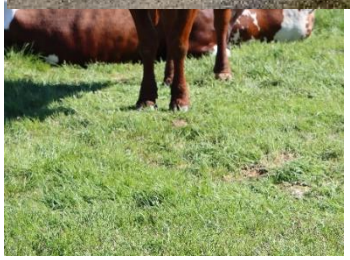
Summer farming, a semi-nomadic practice of moving dairy cattle from the valleys to the tops of the mountains during the summer months is a cultural practice in Norway, supported by government to ensure the land is utilized and to make it feasible for farmers. "If you own land in Norway, you likely own mountain". Cows and owners move up the mountain in June to their "summer house" then close down for the winter. The government gives farmers subsidies to continue summer farming.

The leader for the Farmers Union shared with us how they had just finished their annual negotiations with the government for subsidy programs, which had been increased. The political will for summer farming is still strong: culturally, the community has a strong connection to this farming system, and politically, it attracts tourism to picturesque but non-arable regions.

There are concerns that summer farming will not continue to the next generation. It is less lucrative (milk production decreases in the mountains) and farmers don't retain any extra value for their product in retail outlets and if not for subsidies, many farmers told me they could not afford to continue summer farming.

One dairy farmer shared that his gross income was (in NOK) 2 million, his expenses were 900,000-1,000,000. His net income was 1,000,000-1,100,000, and of that, 550,000 was subsidies and grants.

Figure 41: Summer farming: After milking, cows are able to wander about the top of the mountain, searching for grass until the next milking. They are not fenced in. (Photo Credit: Amy Cronin)



Agriculture in Norway

The agricultural model in Norway is unlike any other jurisdiction I visited: two unique features of its political and economic landscape include subsidies and cooperatives, which will be described in more detail below.

Every year in Norway, negotiations are held between industry and government to determine subsidies and prices, led by the minister of agriculture and approved by parliament. There is broad political consensus on the current system and policy. Cooperatives (common in Norway) play a strong role in these negotiations and in agricultural policy more generally. This creates a balanced flow of products, with costs covered through license fees charged to farmers. They also work to maintain balance in the industry, regulate the size of farms in order to spread production, and regulate pricing to keep family farms alive and entice new farmers to enter the market.

The cost of production is high in Norway with agricultural policies developed primarily around food self-sufficiency. Farms are small, regulated by the government, and dependant on subsidies, which are higher than subsidies in the EU. Imports are restricted through quantitative restrictions, high tariffs and technical barriers to trade which limit competitive products from entering the market (International Trade Administration, 2022).

There are tariff-rate quotas on milk, livestock, and a range of other horticultural products, which enables Norway to further regulate imports to achieve their goal of food self-sufficiency. Processors are compensated for the high cost of inputs from farmers to ensure that they remain competitive with imported products. However, imports have increased by 10% over the past 10 years, which has made farmers and processors more dependant on government policy and subsidies to ensure their existence and success in Norway.

Genetically modified products are also more restricted in Norwegian legislation than in EU legislation, which means that many more EU products are rejected for sale in Norway. In June of 2022, Norway brought in legislation on organic production which aligned more closely with the EU. These organic regulations set the conditions under which agricultural and aquaculture products, foodstuffs, and feed, can be labelled as “organic”. They include requirements that safeguard consumer trust, plant health, animal and fish health, animal and fish welfare and the environment (International Trade Administration, 2022).

Kari Signe Lysne

Kari Signe Lysne is a farmer who is innovative, progressive and ready to tackle anything that seems impossible. I heard her speak at the International Farm Management Association (IFMA) group while on an agricultural tour of Norway.

She lives in Laerdal, in a valley situated near the Sognefjorden (a stunningly beautiful region). The mountains create a rain shadow effect, making the area much drier than the coastline and more difficult for farming. With little rainfall in the summer, this region was the first in Norway to introduce irrigation. Farmers here are innovative and always adapting to remain competitive. Kari and her family are no exception.

She shared how all farms in Norway are very small, which makes working within a co-op essential. Kari's family were the first to start potato farming and fruit farming in Norway. On her farm, she uses every piece of land she can to grow potatoes, carrots, and cauliflower, as well as cherry, peach, apricot, apple, and pear trees. She looks at net profit when considering what to plant or grow, and this approach led her to replace sheep farming with fruit farming, to add to her bottom line. Kari is always looking to other jurisdictions with colder climates for new opportunities such as fruit varieties that will add to her product listing or extend the season of production in order to increase incomes either earlier or later than what she currently produces.

Figure 43: Kari's use of nets on her fruit trees to mitigate risk of weather damage and birds. They also serve to extend the season through frost protection. (Photo Credit: Amy Cronin)

For example, she covers her trees to protect them from rain, uses nets to keep the birds out, and is constantly researching early varieties that could extend her growing season. For Kari, risk management is all about managing the production well, knowing her numbers, and finding ways to add value ahead of other farmers in the area. But she has had to take strategic risks to be able to do this.

Figure 42: Kari Signe Lysne (Photo Credit: Amy Cronin)

Figure 44: Summer farming is a government priority in Norway (Photo Credit: Amy Cronin)

Subsidization and Risk in Norway

When asked about government support, Kari shared with me that farming is "very political" in Norway. She is subsidized at 300,000 Norwegian kroner (39,496 CAD) per year and she recognizes that Norway pays more in subsidies than anywhere else in the world.

How subsidies are dispersed in Norway varies by area, in an effort to ensure that there are farms dispersed throughout the country. Although support payments have been declining, they are among the highest of the OECD countries, and in forms considered most distorting to market incentives (OECD, 2022). As I travelled to many different farms and asked about their financial viability, I found that most of the farms, no matter where they were located or what they farmed, netted about the same amount of money. Norwegian farmers are dependant on subsidies, which comprise up to 50% of a farmer's total income. Farmers all told us that they would not be able to farm without them.

Figure 45: Innovation is at the heart of success in Norway, finding new products to introduce into the market. This farmer created delicious apple cider from the extra apples grown on his farm. (Photo Credit: Amy Cronin)

Norway uses subsidies to manage agricultural production by putting caps on the number of livestock that can be held on one farm, and investing in areas where they feel they need more production to meet the needs of their people. One farmer I was able to talk to shared how he had received a one-time payment from the government to plant his orchard.

This young engineer-turned-farmer has started producing apple cider, both alcoholic and non-alcoholic, to use the extra apples produced in the orchard and add value. The apples will provide sales of of 9 øre NOK (12 cents CAD) per kg, and he will receive the same amount per kg, in subsidies from the government. He has installed an irrigation system, but the water is free, and no license is needed, so those do not factor into his overall costs.

Figure 46: A new orchard, subsidized by the government, is planted utilizing drip irrigation, new technologies, and an apple variety that will extend the growing season, adding to margins. (Photo Credit: Amy Cronin)

Cooperatives and Risk in Norway

Figure 47: New packing house and retail supply outlet built by farmer cooperative adds value to farmer-members (Photo Credit: Amy Cronin)

Kari is a strong agricultural leader and is always looking for ways to help other farmers in her area to succeed. Her passion is in the co-op, which works hard to provide more value for farmers together than they could do on their own. The co-op is always looking for ways to keep a greater percentage of the value chain profits. The farmers' margin is about 2%, processors are 3%, and retailers are 10%. The co-op is made up of 140 farmer-members, and they recently invested NOK 80 million (10.5 million CAD) in a packing house, so they could retain a greater percentage of the profit margin, and in a new supply store that allows farmers to buy supplies at bulk prices.

Norwegians also have a "common land" tradition, which gives landowners and non-owners alike the right to hunt and gather (grazing, collecting firewood, and foraging). This continues today: it is perfectly acceptable, for example, to ski across someone else's fields in the winter. At the same time, Norwegians also feel strongly about their private property, and owning one's own land is important. These and other traditions (such as dugnad) formed the basis for cooperatives, but the cooperative movement in Norway surged forward in the 1990s. Kari was part of this in her area.

DUGNAD: WORKING AS A COMMUNITY

Norwegians have a word, "dugnad", that has no English equivalent: the closest would be communal "help" or "volunteering" but what it means is both deeply Norwegian and deeply human. The word itself was voted 'word of the year' in Norway in 2004.

The day before National Day, everybody in the country volunteers to clean up common areas, like local parks. This comes from Norway's long history of agricultural cooperation: farmers and fishermen had to work together to do what they could not do alone. This is a huge factor in the way that risk management is understood in Norway. Long before insurance companies, the practice of *dugnad* was what you depended on, in the face of the inevitable.

External risks have been around for a long time, and people have long known that one of the best protections against being devastated by the uncontrollable (natural disasters, invasions, etc.) are neighbours.
Dugnad is also a big part of how new immigrants become active members in their new neighbourhoods. Working alongside each other as equals builds relationships and understanding and can reduce the risk of racialized and ethnic friction.

Change and Controversy in Risk Management

Norway is not, however, without challenges in agriculture. A new government was elected in September 2021 and its platform proposed many changes, including policy changes in agriculture That year (2021), there were no annual negotiations between the government and the two farmers' organizations.

Instead, the government proposed a policy setting approach. Their proposal included an increase in target prices, additional budgetary support, and more generous agricultural tax deductions. There was a higher proposed budget for programmes with positive climate and environmental impact, and for rural development. There was a focus on summer farming because it brings in tourist income. Government will also be investing in research to better understand the farm income situation, with respect to other sectors in society (OECD, 2022). At the time of this writing, the government of Norway is also rolling out their "climate calculator" and is confident that they will meet their global commitments because of the parameters they have put in place around the dispersal of subsidies. They also have policies and practices in place to control greenhouse gas (GHG) emissions in agriculture including regulatory, economic and education measures (Norway NDC, 2019). This is not a cheap endeavor and farm leaders told us that the government increased subsidies in 2021, 2022, and 2023 in anticipation of the increased costs for the farmer and the value chain.

The collaboration between government and farm groups in Norway stands out as exceptional. Farm leaders show a mindset of working together to achieve the goals of both farmers and government. Farming in Norway's incredibly difficult terrain and climate has only been successful because farmers have adapted to work with the land and with each other. This climate of cooperation has in modern times led to the development of agricultural innovations, both in terms of growing and production, and also farmer-to-farmer innovations such as the cooperative structure. The government, in turn, has recognized farmers and agriculture as an essential part of the value chain in their goals of achieving food self-sufficiency. Agricultural policies and support programs that are developed through negotiation have meant that the voices and experience of farmers are heard directly. This has resulted in both farmers and government working together to strive toward the same goals, work together to solve problems, and put policy in place to achieve success.

However, more recent changes to the government's approach have resulted in a shift. Rather than starting from a place of negotiation with farmers, with significant input that is translated into the halls of power from the local level, the government is more focused on implementing policy. The decision-making process has become arguably less collaborative and more directive. This recent shift may have unforeseen effects on the negotiation-based way that agricultural risk is managed in Norway in the future.

4.5 Government Risk Management Analysis: Tying it All Together

Introduction

Thomas Jefferson, the author of the Declaration of Independence and third president of the United States wrote in a letter that , "Agriculture is our wisest pursuit, because it will in the end contribute most to real wealth, good morals, and happiness." (Library of Congress, Jefferson Papers) Government plays an essential role in establishing the policies and programs that govern and support both the agriculture industry and the farmers who work within it. As I travelled for my Nuffield studies, I was struck not only by the wide array of approaches that governments took when formulating policy, but the extreme differences in the programs and policies that governments produced. I was fortunate to hear stories about where government had enabled, empowered, and supported their farmers with strong policy. I also became more informed about the opposite as well, where detrimental policy lacked foresight, had a misguided approach or a flawed framework, and where the results had severe repercussions on the farming community and in many cases, society as a whole.

As a farmer, I have experienced firsthand both the benefits and the detrimental effects of agricultural policy. When I started my Nuffield scholarship, I was determined to understand the different programs and policies created for agriculture and how they influence the decisions that farmers make around risk management. I asked farmers about the role that government should play in business risk management (BRM), if government programming had influenced their approach to risk management, their utilization of subsidies or incentives, and their biggest risk exposure. The responses that I heard were fascinating, varying from farm to farm, country to country, continent to continent.

When I started my travels, I expected to hear farmers talk about the importance of programs and policies and the beneficial role that the government plays in ensuring that agriculture is viable and sustainable. I anticipated lively debate over subsidies and their impacts on agriculture, and I did encounter this. To my surprise, however, I saw a trend in farmer responses which permeated into the conversation in almost every pick-up truck, around every table, and in every field: government was often a farmer's biggest risk.

In this analysis of what I learned in the case studies, I'd like to talk about that trend first. After that, I will explore how government policies and programs influence farmers' risk management planning. Next, I will look at subsidies, which governments use to manage risks in agriculture, and delve into the diverse range of subsidy programs and agriculture supports available in different countries and their impacts on farmers. I wanted to look in more detail at one direct income support subsidy in particular, the Common Agricultural Policy (CAP) which often has unintended consequences for the agricultural community.

Following this, I will zoom out to look at the bigger picture: climate change and environmental policy, and the impact of these policies on food security. I heard a great deal of concern from farmers about these larger issues and it reinforced the importance of government and farmers

working together, and cultivating the kind of leadership that focuses on the opportunities and possibilities of the future.

Government as an External Risk

> *"The best thing a government can do to manage risk is to be stable"*
> -Ove Karlsson (2022)

When considering risk within their own operations, farmers continued to refer to the external risks, indicating that the biggest risks were the ones that they couldn't see. Over and over again, farmers told me that the government was their biggest risk.

One of the biggest challenges faced by farmers is the increased financial pressure caused by the transition to sustainable practices and emissions reduction, and the lack of transparency from the government in how farms will be assessed if changes are made. There is also a concern that farmers who have made significant investments towards more sustainable practices will not be recognized by the government. For example, some farmers have faced higher costs associated with infrastructure upgrades, changes in animal feed and decreased production efficiency during the transition phase.

Leadership isn't easy. Climate policies are most often conceived of and developed at the international level (such as the UN's Kyoto Protocol and subsequent Paris Agreement) but they aren't mandated or implemented there. The difference between what gets planned at the international level, what gets mandated at the national level, and then what gets implemented at the local level, seems to be part of the challenge. There is a strong disconnect between those levels and also a lack of understanding between them, especially since different levels tend to have different priorities and therefore see different risks. When policy is made with this top-down approach, a host of problems are created. Inverting the policy-making framework means that farmers are integrated in the process right from the starting line: policies that are built from the ground up have a much better chance of working on the ground.

Farmers have an important responsibility in creating policy as well. They can't have their nose buried so deep in the day-to-day that they disengage from the political process. It's frustrating but essential. If we want to see the policy-making framework inverted, we have to be willing to be engaged in the process from the very beginning.

Nowhere was this illustrated more clearly than in my conversations with farmers in the Netherlands. The last couple of years have proved especially challenging when it comes to policies set by the Dutch government. Derogation of manure application regulations in the Netherlands is being phased out over three years, as mandated by the EU's Nitrates Directive. This means about 18,000 farmers in the Netherlands will no longer be able to spread all the manure from their livestock on the land and will need to pay to have excess removed. This will

cost farmers thousands of euros per year, but they are being mandated to do it, so that their industry aligns with the new regulations coming into play.

In May 2022 (when I was visiting the Netherlands), the announcement of these new climate regulations triggered an uprising by farmers across the Netherlands who opposed the government's climate policies. Farmers, and a wide array of their supporters, hung national flags upside down throughout the country, in towns and rural areas alike, placed round hay bales with slogans spray painted on them in noticeable areas, and even dumped loads of soil on the freeways to block traffic. In 2023, we read about more protests in the news, which has led to some surprising results in the regional elections.

These demonstrations were fueled by a lack of communication between the government and its people, and by fears of economic hardship and uncertainty regarding the transition to what the government was calling "sustainable farming practices." Farmers demanded greater financial support and a more gradual phasing-in of new regulations. The protests prompted the government to engage in dialogue with farmers' organizations to address their grievances and find common ground. But by then, it was way too late.

To put it simply, the government moved too quickly. It got ahead of the people that it represents and misjudged the buy-in of the general public when creating policy.

> *"Go slow to go fast. Slow down the train to let everyone get on, don't leave people behind"*
> -Rob Bradley (March 2023)

Consultation takes time, requires leadership and is a step that governments may be tempted to disregard or do for the sake of "checking off", rather than undertaking it as a meaningful investment in the process. It is easy to become focused on a single issue and the benefits associated with it. In this case, the requirements of their international commitments through the Paris Agreement and their

THE NETHERLANDS AND THE PARIS AGREEMENT

In an effort to align with the Paris Agreement and achieve a substantial reduction in greenhouse gas emissions, the Dutch government introduced a series of climate policies which significantly affect its agricultural sector.

With its low-lying landscape and picturesque fields, the Netherlands is known for agriculture, and they are facing unique challenges in achieving climate change goals. These measures include incentivizing the adoption of sustainable farming practices, promoting circular agriculture, and imposing stricter regulations on emissions from livestock farming.

While some farmers have transitioned to more sustainable practices voluntarily, others have expressed concerns about the financial burden and feasibility of implementation.

All, however, are concerned about the direction of the government and the effect that it will have on agriculture overall and their own individual operations.

commitments to the EU were enough to cause them to move faster than industry was prepared to move.

While the Dutch government aims to achieve a 49% reduction in greenhouse gas emissions by 2030 (compared to 1990 levels), they also seek to position the Netherlands as a leader in sustainable agriculture and foster a positive international image. They hope to enhance soil health, improve biodiversity, and create a resilient food system capable of adapting to the changing climate. But there are consequences to these aims that need to be considered as well.

The changes brought about by the Dutch government will undoubtedly impact the sector's overall productivity and profitability. Farmers' concerns, however, go beyond this. Farmers are, after all, on the ground both literally and figuratively. They see what works and what doesn't work. They are well-positioned to see exactly how many of the "big ideas" being talked about are things that the public have asked for, but are not actions that will, in fact, have a positive outcome on soil health, animal welfare, etc. (Holligan, 2022).

Risk Management: Planning and Strategies

During my travels, I heard farmers describe in many different ways how government policies and programs have a significant effect on how they manage risk, especially in terms of how they are able to plan (or not plan) their risk management. This affects farmers who have a risk management plan, and also farmers who don't have one. When the government offers subsidies and programs, there are strict criteria determining who is eligible and who is not, how much funding they can access, under what conditions, and for what purposes. Narrow funding and eligibility criteria can lead to a landscape of increased restrictions and can often introduce unintended and unforeseen consequences.

The Netherlands

Judith and Rick don't have a risk management plan on farm, citing the fact that the bank only requires a cash projection statement, but a variety of small subsidies contribute significantly to their income. For example, they received a subsidy to assist in the cost of building an education centre, they are able to access subsidies if their energy use is below a certain point, and as a young farmer, Judith was able to purchase new machinery and fertilizer with a 40% subsidy, with an upper limit of €25,000. Although they are dairy farmers, the subsidies on their farm are not directly related to milk production but are rather based on the number of hectares they own. However, subsidies in the Netherlands (as in many other places) tend to be a moving target: there is political will to change this eligibility criteria by 2028, and recently direct income support has been reduced from €14,000 to €10,000 per year.

Canada

In Manitoba, Kyle Friesen farms with his father-in-law and cousin on a cash crop operation. Although Kyle doesn't have a written risk management program, his father-in-law is encouraging him to take that step, saying, "when you write it down, it keeps you accountable." Kyle says he utilizes government programs because he has to stay competitive, but he would prefer that "government focus on opening markets and creating a regulatory system that allows us to adopt technology as fast as possible. A safe food supply is still top of mind. We can't lag behind other countries, or we are no longer competitive." Government business risk management programming has, Kyle admits, played a major part in his risk management strategy. "I take advantage of what is available, managing programs."

Kyle is focused on the numbers of his operation and has spent a significant amount of time in the past two and a half years on budgeting, projections, scenario analyses on potential variances, debt servicing, impact analysis, and capital planning, which allows him to have the data necessary for decision making.

Part of his preventative risk management strategy is accessing government programs. Crop insurance in Canada is a voluntary program that requires farmers to pay premiums. The premiums, however, are not actuarially sound and are subsidized by the government. The Friesens use Crop Coverage Plus (CCP), a coverage option that provides producers more coverage and more compensation in disaster years and is offered in Manitoba by the federal and provincial governments. For the Friesens, the program works well for them since their operation is spread over a large geographical area. In addition, they are able to cover off additional risk by utilizing Global Ag Risk Solutions (GARS), a whole-farm, multi-peril insurance solution that guarantees the revenue on your farm before you even put a seed in the ground. Private insurance also recently became an AgriStability[17] expense, which has added to the benefit of the program.

Rick Stamp is a successful seed dealer and farmer in Alberta, Canada. The Stamp family has a comprehensive written risk management plan which contains everything they could think of to include, encompassing insurance, human resources, errors and omissions insurance, and more. Rick shares similar sentiments as the Friesens. "Risk management is a mindset. Crop insurance is a good program but other than that, the government needs to get out of our lives. They should facilitate business, but not be in business." Rick says that government has not influenced his risk management decisions on the farm. They do, however, use crop insurance as a lending backstop, pushing the line of credit when needed.

[17] AgriStability is a business risk management program under the Sustainable Canadian Agricultural Partnership, which is intended to "[protect] Canadian producers against large declines in farming income for reasons such as production loss, increased costs and market conditions" (Agriculture Canada, 2023).

Australia and New Zealand

Not all governments have subsidy programs. Australia and New Zealand have the lowest levels of farm subsidies in the OECD (see Figure 48 on p. 84). While visiting Australia, I had the opportunity to visit with many farmers, hearing stories of risk and reward, boom and bust, and risk management strategies that differed from what I had seen in other areas. Although there are no subsidies available to farmers, the government does create programs to help farmers to deal with risks. In the case study on Dave Gooden, I explained different programs that were available to farmers and the tools that he had put in place to mitigate risk on his farm.

Caitlin Radford, an energetic young farmer from Australia, was able to attain an AgriGrowth loan from the Tasmanian government. These loans, which can be up to $3MM, cover up to 80% of a recognised valuation for freehold assets provided for loan security. Without this $2.5 MM government loan[18] (Tasmanian Government, 2023) Caitlin says that she simply would not have been able to buy her land. She is fortunate to farm alongside her mom and dad and is "learning from the best."

Australia also provides support when unexpected weather events come their way. The greatest risks are the ones that you don't see coming, drought, floods, mouse plagues, wildfires: all of these have prompted the Australian government to support farmers. These payments, however, are only to cover losses sustained, although investment programs are available to farmers which can mitigate risk related to adverse weather events (like the ones listed above). For example, farmers are able to apply for funds to help with water infrastructure such as irrigation to ensure that they are able to withstand the challenges that the next drought will bring their way. They can also be funded to put in containment feeding infrastructure to ensure a supply of feed when the grasses dry up.

Government grants are also available to put silage in blocks, cover them with plastic, and store them in the sides of mountains. Feed can be stored for up to 40 years this way, ensuring that there is a supply for the next drought. Australians are also able to utilize tax averaging, where farmers are taxed on the average income of five years and not the current year. The advantage to this is that three good years can be averaged with two bad ones, thus saving money on taxes paid.

There are also risk management tools in Australia which are provided by organizations which are arms-length from the government. Scott Cameron is from Meat and Livestock Australia, an organization funded through producer levies, government and voluntary contributions from industry partners. He shared with me the services that they provide for their meat and livestock industries: research, tools and resources, pricing and market information, and government programs. Scott referred to Farm Management Deposits (FMD) as a valuable tool for farmers,

[18] For more specific information on the AgriGrowth Loan Scheme offered by the Tasmanian Government's Department of State Growth, please see: https://www.stategrowth.tas.gov.au/grants_and_funding_opportunities/loans/agrigrowth

giving them the opportunity to manage their cash flow and taxes between good years and bad. In years of profitability, a farmer can deposit money into an FMD and avoid the tax. When a bad year comes around, farmers can access the funds at that time and pay the tax in the year it is used.

Zimbabwe

When I visited farmers in Zimbabwe, the context of risk in that country was different than in any of the other countries I visited (which were all stable democracies with functional economies). In Zimbabwe, the political instability forces Zimbabweans into a perpetual crisis mode, in which they are forced to constantly be solving problems and "put out fires". It is normal for the hydro to suddenly go out, for the rules to change, and for the rate of inflation to spike and drop drastically. I found that influenced how farmers made decisions: they were more able to accept risk in that unstable context. As I heard from one farmer, "What is the difference? I either lose the farm or I lose the farm and the shed."

The world is constantly changing, policies and programs in agriculture, public perception, buying patterns, and other factors that influence production are not static. Farmers need to be aware of the signals surrounding them and be able to adapt to change. Zimbabwe is a land of constant adaptability: the lack of confidence in regulation and its government pushes farmers to adapt on the fly. What I witnessed in Zimbabwe reminded me of what Neil Beaumont, CFO of Fonterra in New Zealand said (not specifically about Zimbabwe but more generally):

> *"When you are fighting for survival, you don't have the luxury of thinking long term. You just do what you have to do. There are different approaches to risk when day in and day out, you are faced with things outside of your control"*
> -Neil Beaumont (March 2023)

JENTELOVEN

Jenteloven is a Norwegian word that describes a cultural feature that is common to Norwegians (and other Scandinavians): it generally translates to putting society ahead of the individual, not boasting about individual accomplishments, and not being jealous of others (Nikel, 2015).

The Swedish word '*jente*' has a similar meaning. It was evident as we travelled throughout Norway, Sweden, and Denmark, that this approach is still quite prevalent today. This cultural feature could help to explain the invention of these subsidy programs in Norway, especially since Norway is not part of the EU and is therefore not subject to their policies and programs. This concept also helps to explain the numerous cooperatives found in Norway and the commitment to working together through this system to help all farmers succeed.

In Sweden, I also heard about how the culture of *jente* may also be a reason that farmers have not taken as much advantage of some of the farm management resources available to them. Ove, (whose work teaching the Five Pillars of Risk Management is described in Section 2.3 (Preventable Risk in Agriculture) described *jente* as a potentially limiting factor to farmers in Sweden, indicating that because some farm management resources are focused on profits and on individual farms, that farmers may be slow in their uptake.

Subsidies: Government Risk Management

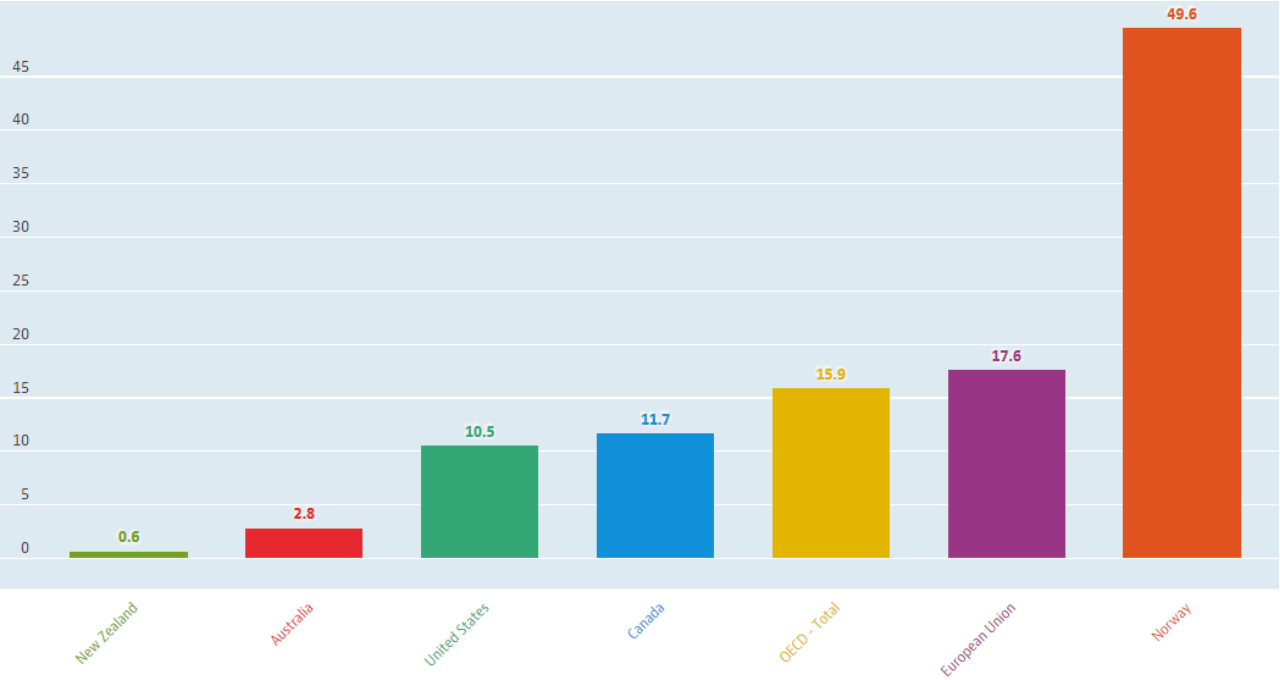
Looking at agriculture from the perspective of government, we can see how the subsidies and farm programs (as described above) are seen by the government as risk management on a large scale. The case studies in the Government Risk Management section describe a variety of approaches by government to risk management in agriculture. These policies and programs have evolved over many years, steeped in the country's national and regional histories, culture, geography, and its social and political circumstances. In Norway, we read about a desire for food self-sufficiency in a country that will always be dependant upon imports because of their northern climate. At the same time, the extensive governmental control within agriculture ensures that agriculture is dispersed throughout the country, and that farmers have moderate incomes despite the challenges of farming in Norway. This government intervention also ensures that the amount of food produced is controlled, so that exports are limited. Beyond that, they are a country with access to wealth through their oil resources in the mountains, they have access to abundant hydroelectric power and clean water resources, and they have peaceful labour relations, enabling them to pay more in subsidies to help them achieve their goals as a government.

Norwegian farmers, however, are dependant on these subsidies from the government to make ends meet. On every tour that I went on and every farmer that I talked to, I heard about the necessity of subsidies[19]. These payments are not because farmers in Norway have poor agricultural practices but rather because they are farming in a harsh climate and a challenging geography, which can limit production. As I listened to farmers talk about their gross income, expenses, subsidies, and net income, I noticed that most farmers, no matter what they farmed, had roughly similar bottom lines. The extensive involvement of the government has ensured that subsidy payments are higher in areas where farming will result in lower net incomes.

However, subsidies have been on the decline for a number of years. In many areas of the world, this is perceived as a welcome step and pressure continues to mount to reduce direct payments and to link subsidies to cultural and environmental goals (Hemmings, 2016).

19

Figure 48: 2021 or Latest Estimates of Agricultural Support by Country (Producer Support % of Gross Farm Receipts)



As seen in the chart above, subsidies[20] play a role in supporting farmers around the world. This chart is the result of an interactive tool on the OECD website, which can be used to highlight certain countries. It shows the producer support (PSE) percentage of gross farm receipts in each country. I used this tool (which can be found at https://data.oecd.org) to display the countries or zones (such as the EU) that I was able to visit, in order to use data to illustrate the pros and cons of subsidies that I heard about throughout my travels.

In North America, subsidies are significantly lower than those in Norway and the EU. Norm and Laura Shoemaker are cash crop farmers from Saskatchewan, Canada and they are also Outstanding Young Farmer alumni. They told me about how, because of the programs offered by the Canadian government, the government now plays a massive role in risk management. "Margins can be thin and you need to go to the lender to get money. Without AgriStability, AgriInvest,[21] and crop insurance, this could be a challenge." Norm and Laura also say that government programming has allowed them to take on more risk, and specifically, as they describe "more calculated risk." For example, Norm described how one program allows his crop history to be carried with him when he moves to new geographical areas with a different soil

[20] Subsidies are one form of what the OECD defines as agricultural support: "the annual monetary value of gross transfers to agriculture from consumers and taxpayers arising from government policies that support agriculture, regardless of their objectives and economic impacts" (OECD, 2023)

[21] AgriInvest is a self-managed producer-government savings account designed to help farmers manage small income declines and make investments to manage risk and improve market income. Each year, farmers can deposit up to 100% of their Allowable Net Sales to their AgriInvest account and receive a matching government contribution on 1% of their Allowable Net Sales (Government of Canada 2023).

type. He also is able to stack programs, utilizing private insurance to fill the gaps in government programming. But Norm and Laura don't depend exclusively on government programs to manage their risk. They use different strategies which don't depend on government support, including diversification and hedging, benchmarking, peer groups, networking and lifelong learning.

Common Agricultural Policy

> *"It's so frustrating when I see governments and different institutions throw things at farmers and wonder why they get upset. Talk with farmers instead of at farmers"*
> -Andy Macfarlane, Elected Director Fonterra (February 2023)

In the EU, agricultural policy is implemented through a system of agricultural income support, market measures, and rural development measures (European Commission, 2023). These have a significant (but uneven) impact on farmers and illustrate the unintended consequences of subsidies as a form of government risk management. The Common Agricultural Policy (CAP) is an EU policy designed as a partnership between society and agriculture to ensure a stable supply of food, safeguard farmers income, protect the environment and keep rural areas vibrant. It focuses on direct income support to farmers to promote food security and sustainable farming.

Different countries implement the CAP differently, resulting in opportunities and challenges for farmers within different jurisdictions. For example, Cissi Klasson, a hog producer in Sweden, spoke about how Sweden interpreted and implemented the rules around animal welfare in a more stringent way than other EU members, which means that she has to pay a higher cost to comply with those rules. To compensate for these higher costs, Sweden created a subsidy for animal welfare. These payments, Cissi says, help her to offset the additional costs incurred by the Swedish regulations, especially since there are no base payments for hog producers in CAP.

Oscar, an organic beef producer in Sweden, told me that he was very concerned about the potential removal of subsidies linked to beef production in the new CAP program (which, at the time we spoke, was before the updated policy came out in January 2023). The changes would not be announced until October of that year, which would leave him little time to plan for his business. He is dependant on subsidies to offset the additional costs incurred with producing organic beef: the market reality is that organic beef is that the price farmers are paid for organic beef is not much higher than that paid for commercially produced beef. Since he is unable to make up for his increased costs under those market conditions, one quarter to one third of his income comes from government subsidies.

In contrast, Gregoire Ferre, an innovative organic beef producer, orchard operator and cider maker from France, converted his entire operation to organic. He sees this as the way of the future and points to the EU's priorities and the programming that was available for the

conversion to organic, stating that it certainly helped him to move that way faster. He owns his land and is able to utilize EU subsidies in many ways, including direct payments of €130 per hectare on land and on his cows, through a "green payment" that rewards diversity, and also through an organic subsidy payment. In addition to CAP funding, Gregoire has been able to access regional funding for smaller projects such as storage, a building for a new apple press, and assistance in marketing his product. He has created an investment plan and, if it qualifies (which is determined by the government), he will be able to access subsidies which could cover 40% of that. He already has a plan on how he will use those funds. "Politics and policies are out of a farmer's control. By direct-selling cider, I have no subsidy. The apple production gets some but it's nothing compared to the land. This is where the politics arrive – but who has time to lobby?" Instead, Gregoire focuses on travelling to different parts of the world to better understand his business and plan his next steps.

As described in the case study on the Netherlands, Rick and Judith de Vor identify the government as a huge risk for their farm, but Judith is still passionate about building a bridge between government and the farming community, and that is why they used subsidies to build De Elihoeve, an education centre on their farm.

Judith also shared a classic example of how government programs can have unintended consequences for the agricultural community. Since CAP programming is based on direct subsidies for land holders in the EU, this is proving to be a challenge in terms of succession planning. As Judith explained, farmers, as they retire, are not willing to sell their land since this would mean that they no longer have access to the CAP subsidy. Instead, they are leasing or share-farming with the next generation of farmers. She says, "When we talk about young farmers taking over, it won't happen - farmers become sofa farmers. They retire but they keep the land to keep the subsidies. Half of the agricultural budget is actually going to nature organizations. Only 40% is going to agriculture. Politicians think that ag is getting a lot of money. That is why I built the educational centre, to overcome differences between farmers and politicians and urban people, to tell how we grow fields" (de Vor, 2022).

Climate Change and Food Security

When we zoom out to look at the bigger picture of risk management, on a national and even an international scale, it is evident that things get more (not less) complex. Not only are there no easy, one-size-fits-all solutions but every action carries consequences, some of which can be foreseen but most of which cannot. Actions such as reducing our reliance on production which uses finite resources, or using globally recognized sustainable agricultural practices have many potential benefits. These could include boosting the export of sustainable products and capitalizing on the growing global demand for eco-friendly produce. But there will also be consequences to those actions. Globally, farmers shared with me that because of the pandemic and the war between Russia and Ukraine, input costs have gone up significantly and that has resulted in the cost of food going up substantially. If we add the additional costs of implementing new sustainable agricultural practices, what unintended consequences will that have for food security? This was a pressing question for the farmers I spoke with in the

Netherlands, the second largest exporter of agricultural goods in the world (International Trade Administration, 2022).

In New Zealand, climate change was at the forefront of every conversation. There too, they are struggling to find the balance between government priorities and farm sustainability. Vangelis Vitalis, (Deputy Secretary & Chief Negotiator for the Ministry of Foreign Affairs and Trade) told me that international trade agreements are becoming more difficult due to environmental requirements. In the recent agreement negotiated between New Zealand and the UK, discussions revolved around the impact on animal, plant, human health, animal welfare, the environment, and sustainability. The challenge for New Zealand is that it is 19,000 kilometres away from the UK, and there are questions about the sustainability of even getting New Zealand products to the UK or the EU.

Although the government is often clearly indicating that environmental sustainability is the way forward, this doesn't always work out on the ground when farmers have to integrate that concept into their business plans. This is illustrated clearly in the case study featuring Kuijpers Kip, a Dutch family farm that has been labelled the most innovative climate and energy system in the world, who have nevertheless faced challenge after challenge in moving their business plan forward.

Environmental policies aimed at reducing climate change can have both direct and indirect impacts on the price of food around the world and global food security. While these policies are essential for mitigating the effects of climate change and ensuring a sustainable future, their implementation can pose certain challenges for the agricultural sector. These include:

1. **Increased Production Costs**: As governments introduce regulations and standards to promote sustainable farming practices, farmers will likely face higher production costs. For example, in the Netherlands, Kuijpers Kip and Roland van Asten have proactively installed air scrubbers in their chicken and hog facilities, but regulations still incur significant costs and are financially burdensome. Increased production costs can lead to higher prices for agricultural products.
2. **Reduced Land Availability**: Some environmental policies prioritize the protection of natural habitats, which can limit the amount of land available for agriculture. The Netherlands has announced that this is a direction that they will go, and Canada has indicated that they too may move in this direction. Canada loses 20000 to 25000 hectares of prime farmland to urban expansion each year (Canadians for a Sustainable Society, 2023). As a result, there may be reduced agricultural output, leading to potential scarcity and higher prices for certain food commodities.
3. **Changes in Crop Choices**: To comply with environmental regulations, farmers may need to alter their crop choices. Crops with a higher carbon footprint, or that are associated with deforestation, or less biodiverse farms, may be discouraged, leading to shifts in production to other crops. These changes can impact supply and demand dynamics, potentially affecting food prices. As governments implement policies that encourage the use of biofuels, there can be an increased demand for crops such as corn and soybeans,

which are used for fuel rather than food for humans or animals. This can add to pressure on food supplies and contribute to higher food prices.

4. **Trade and Tariffs**: In New Zealand, there were conversations around how environmental policies influence international trade through the imposition of tariffs on products produced with higher carbon footprints. Trade restrictions can disrupt global supply chains and contribute to fluctuations in food prices.

The impacts of these environmental policies on global food security can be significant, especially for vulnerable populations in developing countries. In Zimbabwe, for example, the increased food costs have resulted in people going hungry. The cost of bread, for example, has skyrocketed from ZWL$1800 in April to between ZWL$8,000 and ZWL$12,000 per loaf. There is a fear that government handouts to the hungry and vulnerable will influence the next election being held in August 2023 (Langa, 2023). Higher food prices can exacerbate food insecurity and malnutrition, making it harder for people to access nutritious and affordable food. Disruptions in food supply chains due to changes in agricultural practices may lead to food shortages, affecting regions that rely on food imports.

Policymakers have a great deal of work in front of them as they work to balance the objectives of environmental policy and food security. Farmer sustainability is another important part of the equation. To address the challenges, there is a need for integrated approaches that consider environmental concerns, socio-economic implications on food systems and a collaborative approach to policy making that includes the voice of the farmer. The world has changed a lot since the Paris Accord was signed in 2015. We haven't changed the timelines associated with the expectations, despite the dramatically changed economic positions of government and industry alike.

NEW ZEALAND'S CARBON CREDIT SYSTEM

As I travelled throughout New Zealand, I observed a growing trend among farmers to buy forests for carbon credits as an additional income stream and a strategy to mitigate their agricultural emissions and contribute to climate change mitigation efforts. Under this scheme, farmers purchase or plant forests on their land in order to sequester carbon dioxide from the atmosphere.

The amount of carbon sequestered by the trees is measured and verified through a monitoring and reporting process, which then determines the number of carbon credits earned by the farmer. These carbon credits can be sold on the emissions trading market, generating additional income for the farmers. Companies and organizations seeking to offset their own emissions may purchase these credits to compensate for their carbon footprint.

The New Zealand government recently created an Emissions Trading Scheme (ETS), a cap-and-trade system designed to incentivize the reduction of greenhouse gas emissions in the country and was created to reach their 2050 greenhouse gas targets. Farmers, at this point, are not currently required to surrender emission units for the biological emissions produced by agricultural activities. They can, however, use forests to provide an additional income stream to their farm.

Food Systems, Food Security and Interconnected Risks

"Almost everything we have is either mined or grown. In affluent societies we get removed from the reality of that. We are used to things appearing, as markets work remarkably well. All of a sudden, people don't understand why they can't get what they want.
-Neil Beaumont, CFO Fonterra (March 2023)

Prior to 2020, governments from around the world had worked hard to come together and discuss difficult topics like climate change. In 2015, the Paris Agreement was adopted by 196 countries and in 2016, it was brought into effect.

The pandemic had a profound impact on food systems worldwide, causing disruptions that were particularly evident in the "just-in-time" delivery model commonly used in grocery stores. As governments implemented lockdowns and travel restrictions to curb the spread of the virus, supply chains faced significant challenges. The reliance on swift and efficient delivery systems became strained as transportation networks were disrupted, leading to delays in the shipment of essential goods and produce. This, in turn, led to empty shelves in supermarkets, highlighting the vulnerability of the "just-in-time" approach during times of crisis.

One shift in thinking that many people experienced during the pandemic is the realization that our leaps and bounds in technology and the systems that are now deeply integrated into the way we live and do business (apps, the "internet of things", metadata, etc.) have also made us more interconnected on a systems level. This is an unforeseen, unprecedented level of global shared risk that allows for both increased growth in food security, and also increased risks. We cannot reap the benefits of an interconnected world without also increasing our exposure to the risks that come with that interconnectivity.

Beyond the immediate challenges in local food supply, the pandemic and the Ukraine war exacerbated global food security concerns. With reduced agricultural labour availability and disruptions to cross-border trade, food production and distribution were hindered on a global scale. The interconnectivity of the global food market became evident as price fluctuations and shortages in one region would ripple across the world. Increased food prices further exacerbated poverty and hunger, especially in vulnerable populations.

Feeding the world has become a complex challenge as these disruptors highlighted the vulnerabilities of relying on a streamlined, just-in-time delivery system and the potential risks of a highly interconnected global food supply chain. In the face of climate change and geopolitical conflicts, it is crucial to develop more resilient and sustainable food systems. Governments, organizations and agricultural stakeholders must work together to invest in local food production, improve storage and distribution infrastructure, and promote diversified agricultural practices. By fostering regional food self-sufficiency and supporting smallholder

farmers, the world can better withstand future shocks from risk (including external risk), ensuring food security for all.

Final Thoughts

It became clear to me in my travels and in writing these case studies that there is a disconnect between government and farmers in many countries, which is contributing to a widening gap between the people and their elected officials. Each country that I visited had climate change as a high priority but not every country had instilled fear in their farmers in the same way as the Netherlands has. It was this in particular which led me to recommend that governments engage in dialogue in meaningful ways with the farming community, which is one of the recommendations listed in this report.

In a delicate dance between feeding a growing global population and safeguarding the planet's natural resources, agriculture policies hold the key to a sustainable future. Across diverse countries and continents, governments grapple with a pivotal question: can their policies and programs effectively uphold global and national priorities while ensuring the prosperity of farmers? As the world confronts pressing challenges like food security, economic development, and climate change, striking the right balance becomes imperative. As we search for answers to these complex issues, it is imperative that we explore agriculture policies that not only impact the way we cultivate and consume but are created in a way that supports the agricultural sector. This will instill confidence in a pathway forward that works for both government, farmers, and the people we feed around the world. Governments and farmers can and must work together. If we are driving fear and going too fast, we are not leading. Leadership comes from shining a light on the opportunities and possibilities of the future.

5.0 CONCLUSION

According to a recent poll (Canadian Federation of Independent Business, 2019), farmers are one of the most well-respected groups in Canada, well ahead of government, unions, and large companies, and they make a significant economic contribution. How farmers understand and face risk is part of that reputation: farmers are problem solvers, wearing many hats to grow our businesses and provide food for our communities and the world. Farmers pay close attention to the preventable risks within our control, by implementing best practices, and having written protocols, ensuring that teams understand how to do things well to ensure that fewer things go wrong. Less visible to the public but no less valuable, we also think about financial management, marketing, producing quality products, purchasing insurance to cover off risk, and succession planning. We prevent the preventable and mitigate the inevitable. To be sure, things still go wrong, but we do our best to reduce the frequency or severity.

My conversations with farmers led me to see how strategic risks, those we voluntarily accept in order to grow or change our operations, are not always unfavourable. In fact, I could hear excitement in their voices as they talked about strategic risks and what they were doing to mitigate them. Farmers like action. But we can't manage these strategic risks using the same

compliance-based approach that works so well for preventable risks. Instead, we need systems to reduce the probability of risk that threatens strategic objectives and favours risk-taking in a way that maximizes reward. Effective risk management strategies allow farmers to not only take on more risk, but to take smarter risks.

Some risks are beyond the preventable or strategic, and these are the major disruptors that can wreak havoc on a farmer's risk management strategy altogether. These are external risks, the big, scary and sometimes unimaginable ones that we can't see coming until they're on our doorstep. Farmers around the world alluded to external risks when they admitted to not having a written risk management plan. These are the risks that overcome us with fear and overwhelm, a mindset which creates barriers to thinking through solutions and working together. Roland van Asten referred to these risks as the unknown unknowns and confided that, even as a progressive and extremely successful farm family, they didn't know how to approach external risks. This is understandable – it is human nature to feel unsure, stuck, and even paralyzed by fear of the unknown.

> *"Farmers are facing a huge wave of regulations. This challenges farmers' identities as they relate farming practices to who they are. We can't leave farmers out of the conversation. If we want outcomes, we need farmers to get their hands dirty and be involved. No one can do it individually. We need to work together to create change and move forward"*
> -Erica van Reenen, managing director of AgFirst Manawatū-Whanganui (2023)

That is why we need to have a strategy in place: this allows us to think through how we might manage our farms in situations like these. Alex Sidorenko talks about having a 'risk-taking mindset', one that focuses on overcoming fear and uncertainty by coming up with multiple solutions. By imagining our way out of the unimaginable, we often find in the process that our fears were unfounded. Large corporations are encouraged to have risk management teams who are able to regularly come together to identify potential risks and talk through solutions. However, farmers work in an entirely different business infrastructure and frequently work in isolation or with a very small team. Further, risk affects more than just their business and the stress of potentially losing everything can make thinking about risk intensely overwhelming. This is especially true when it comes to thinking and talking about external risk.

There are solutions and strategies that can help farmers feel supported in their risk management strategies and empowered to make better decisions for their farm. My recommendations describe a number of ways that farmers can take on all three types of risk: by creating community around them and fostering both a personal mindset, and a group-level culture, of active risk management. This will ensure more effective risk management plans that do more than collect dust and will lead to outcomes similar to those produced by corporate risk management committees.

However, taking a proactive and collaborative approach to risk management is not just best practice for farmers. It could represent the way forward for government and industry as well. Farmers in Canada and around the world often identified the government as their "biggest risk". Although this surprised me at first, as I listened, I came to understand why. Prior to 2020, farmers were facing uncertainty related to trade disputes and harvesting challenges. Even now, farmers are still recovering from an increased cost of production due to the pandemic, the Russia/Ukraine war, labour shortages, system disruptions and the logistical nightmare of trying to adjust to these challenges, often all at once. No wonder farmers are deeply concerned about government imposition of climate policy which could suddenly change system requirements, increase costs, and lower production. These additional external risks are coming at a time of unprecedented challenge and uncertainty. As Devry Boughner Vorwerk, CEO of DevryBV Sustainable Strategies described "We are facing geo-political headwinds that we have never seen before."

The framework of top-down policymaking has widespread and lasting ramifications on industry and on society. This is particularly true when it comes to climate policy: governments agree to aggressive targets, and only after the fact do they think about how to meet those targets, often leading to mandates that have to be implemented, somehow, by farmers. This far-from-the-farm framework is causing increasing concerns and, in some cases, wreaking havoc. It also excludes farmers from policymaking and is a missed opportunity for the government to listen to on-the-ground solutions farmers have already invested in and may even have been implementing for years. This was particularly visible in case studies which looked at what is happening in the Netherlands.

Policy development that is inclusive of farmers, the hands-on implementors, industry, and industry associations, is a powerful way that governments can strategically and sustainably manage the risks inherent in a highly competitive global marketplace. Effective leadership focused on people, planet and profit will lead to better outcomes than those outlined in the case studies which look at some bad examples of agricultural policies in Denmark, the Netherlands, and Zimbabwe. Things can be different: by inverting the policy making framework to include farmers from the very beginning, by maintaining clear and open lines of communication, and by engaging in meaningful consultation. Governments in search of innovative, sustainable policies should be looking to solutions created by farmers, for farmers. Government needs to talk to farmers, and farmers need to talk to the government.

Risk, including external risk, is inevitable. Those risks which can't be neatly solved and tied with a bow are extremely challenging. But they become less scary if we take an active, purposeful, and solutions-oriented approach: with each other as farmers (utilizing peer support), and collaboratively, including farmers, industry, and government. As Gary Cohn says, if you don't invest in risk management, it doesn't matter what business you're in, it's a risky business.

What we face today doesn't fit into the traditional risk management framework. We can learn to ride the waves of uncertainty but first we have to challenge ourselves to get comfortable in the tension and move past the inner reluctance to avoid thinking about these extremely uncomfortable risks. Having witnessed the incredible risk management strategies by farmers around the world who are taking on the challenge of actively thinking through risk, I have seen that we can do this. Having come along for the journey, I hope you can see this, too. We do hard things on a daily basis. We've got this – together.

> *"May your choices reflect your hopes, not your fears"*
> -Nelson Mandela

6.0 RECOMMENDATIONS

6.1 Recommendations for Farmers

1. **Develop a Risk Mindset:** Take action on the preventative, weigh the risk/reward on the strategic, and overcome the fears of the external.
2. **Business Consultants:** Business consultants (outside government), are an extremely valuable resource who can encourage out-of-the-box thinking, delve into the numbers, generate forward-thinking and interactive discussions multiple times per year, and put plans together for the "what-if".
3. **Peer Groups:** Develop and utilize peer groups. This does not need to be an expensive endeavor. In fact, working with a group of farmers that you put together can be effective and cost-efficient, provide a necessary support network, and allow your group to concentrate on continuous improvement on each individual farm. I recommend including a focused discussion on risk management at every meeting that encourages every member to participate in talking through external risks.
4. **Active Risk Management Approach:** Utilize the tools and resources that are available such as Farm Management Canada's AgriShield program, which is designed to walk you through potential on-farm risks. More importantly, think of risk management as an "active" file and not a "one-and-done" to put on the shelf.
5. **Leadership:** The utility of leadership is getting things done, but its real value is unleashing the power of others. Hoarded power is finite, but unleashed, it is infinite (Parsons, 2023). Farmers have an important role in defining and getting involved in agricultural leadership, ensuring that the very best people are representing their industry, not just the ones that have time or enjoy the per diem. Leadership is not simply becoming chair of the board but creating conditions and accountability around purpose. It is also having the capacity to navigate and influence increasing complexity and increasing risk that can impact policy development and the business of farming (Keegan, 2023). Farmers must be willing to continually educate themselves and have discussions on how they can look at things differently and how they can take ownership of the problem so that they can participate in the solution. We have a responsibility to ensure that our farm leaders have the capacity and the resources to move the needle. They, in turn, can create the space to acknowledge the problem and put resources towards the problem. Objectives without resources are merely aspirations. We have to encourage our leaders to stay in uncomfortable spaces and do hard things.
6. **Create a Buffer:** Farmers often stretch themselves to the limit, leveraging their farms to grow more quickly, etc. Creating a buffer will allow you, in times of challenges, to access the finances necessary to manage risks as they come your way.

6.2 Recommendations for Industry

1. **Leadership Shift:** In a time of increasing complexity and increasing risk, industry has at times, failed to acknowledge the problem and therefore, failed to participate in the solution. This leaves a gap that has allowed others, including government, to step in and

create policy that is unworkable and challenging. We need to shift our thinking. Industry, including farmer associations, cooperatives, and agri-business, must strive towards ***both*** public interest and farm business success, a shift from simply being focused on business without acknowledging public interest. This requires a plan, not simply a response, that will address real and legitimate needs. We saw this work effectively in the Grow Ontario Together participation in the Lake Erie Action Plan. Industry did the hard work of coming together and into the tension, having the courage to acknowledge and own their part of the problem of algae in Lake Erie, presenting workable solutions to government and, therefore, attaining the ability to define the solution which proved successful in the release of new government policy in Ontario, Canada in February 2018. The key here is to recognize that the work is never done. Solutions for policy goals require ongoing and constant engagement. Process happens at the speed of trust and industry has to concentrate on maintaining that trust, listening in order to be heard, and engaging in purposeful and meaningful conversations. It is through this work that industry has the possibility of making smart policy, rather than ensuring that it is stupid.

2. **Creating One Voice:** Industry is known for working in silos. Each association or producer organization speaks for their members, in their own commodity, jurisdiction, or part of the value chain. For example, organic associations speak only for organic farmers, dairy associations for dairy farmers, and they often do not include the rest of the value chain involved in that product. Coming together to speak with one voice is hard work and even more challenging to sustain, but it is necessary to create influence.
3. **Future Considerations:** Leaders often work from a reactive standpoint, focusing on the issues that are current, which causes distress for their members. Through a collaborative approach to leadership, industry can work with their stakeholders and partners to take on a forward-facing focus, identify upcoming issues, and find solutions.
4. **Creating Vibrant Leadership Ecosystems:** Industry plays a key role in ensuring strong and effective leadership and facilitating healthy and thriving teams. This creates an ecosystem that is able to effectively manage rapid change in a highly competitive and global marketplace, ensuring that teams can communicate more effectively, resolve conflicts, and make faster, better decisions. This can drive teams to become more agile, more resilient, and more sustainable over time (Executive Coaching Connections, 2021).
5. **Education is Key:** When key leaders are identified, leadership should be provided by industry. For example, in Australia, when I spoke with the chair of Dairy Taz, she was about to embark on a leadership training program for rural leaders valued at $50,000 which focuses on self-development, and leadership skills.

6.3 Recommendations for Government

1. **Communication from Top to Bottom:** Government happens at many levels and oftentimes, what happens at the international level is not shared with national, provincial/state governments or the municipal governments, making it hard to create policy that is implementable and workable at the local on-the-farm level.

2. **A Duty to Consult:** Government represents the people, and yet farmers are often not involved to the extent required or necessary in problem solving and policy making. Although working collaboratively is more challenging and policymaking is slowed down, we need to go slow to go fast. If we slow down the train to let everyone get on and we don't leave people behind, government can produce an outcome that industry has bought into, that provides solutions in which farmers can see themselves and their role. It is important to recognize that there is no one-size-fits-all solution. Farm systems are diverse and what is good for one farmer will not be right for another. Farmers need to be in a place where they can explore the options and then decide what changes they will make that will suit the farm.
3. **Invert the Policy-Making Framework:** In the same way that industry must look at themselves as solution providers, government has to provide the opportunities for industry to step up and into the space of partnership and collaboration. Desired policy goals should be presented to industry, encouraging them to participate in the discussion and mapping the way forward together. The leadership required by both government and industry requires courage and a commitment to meet the needs of the public while recognizing the essential need for farmers' businesses to thrive. The dynamics involved between government, public interest, and the farmer is always at play and a continued adherence to relationship is essential. While the government can bring to the table the requirements it has to meet international commitments, public interest, and policy goals, it has, at the same time, a responsibility to approach solutions in a collaborative manner. It is critical for the government to understand that it is farmers who will be the ones to necessitate action. We need to work together. If we are driving fear, we are not leading. Leadership comes from shining the light.

GLOSSARY

Term	Definition
Advance Payments Program	A federal loan guarantee program which provides agricultural producers with easy access to low-interest cash advances of up to $1 million
AgriInsurance	A Government of Canada program which provides cost-shared insurance against natural hazards to reduce the financial impact of production or asset losses
AgriInvest	A Government of Canada program which provides cash flow to help income declines
AgriRecovery	A federal, provincial, territorial disaster relief framework to help producers with the extraordinary costs of activities necessary for recovery following natural disaster events
Agrishield Risk Assessment and Planning tool	A comprehensive online platform for managing farm risk which allows farmers to assess, plan and take action on risks available on MyAgriShield.ca
AgriStability	A Government of Canada/provincial program which provides support when producers experience a large margin decline
ASF	African Swine Flu: A viral disease that only impacts pigs (and does not infect humans) but poses a significant risk to the pork industry
BBB	BoerBurgerBeweging is an agrarian, conservative political party which can be translated from Dutch into English as the Farmer-Citizen Movement
BRM	Business Risk Management: Generally, a critical process of business management in which risks are identified, analyzed, solved and monitored by the company. In a Canadian agricultural context, BRM can refer to specific programs designed to support farmers in mitigating risks (AgriStability, AgriRecovery, AgriInvest, AgriInsurance, and the Advance Payments Program)
CAP	The Common Agricultural Policy is the agricultural policy which is shared by member states of the European Union, introduced in 1962 and comprising a system of agricultural support, including subsidies and other programs
Circular agriculture	A term used by the United Nations which they define as focusing on using minimal amounts of external inputs, closing nutrients loops, regenerating soils, and minimizing the impact on the environment

Derogation	Allows farmers to operate beyond the limits set by environmental or agricultural policy or regulations, but only if farmers can show compliance with a set of strict rules
EBITDA	An acronym used by investors to measure company profitability (**E**arnings **B**efore **I**nterest, **T**axes, **D**epreciation, **A**mortization)
EEA	The European Economic Area includes all (27) European Union member states, with the addition of three non-EU states: Iceland, Liechtenstein, and Norway, into a single internal market
EFTA	The European Free Trade Association is the intergovernmental organization which promotes free trade and economic integration between Iceland, Liechtenstein, Norway, and Switzerland
EPP	The European Pig Producers is a European network of farmers, advisers and researchers which provides a platform for the exchange of information, co-operation and contacts between members
EU	European Union: A political and economic union of 27 member states located primarily in Europe
Five Pillars of Risk Management	In a farm business management context, these are: Markets, Economics, Leadership, Production, and Strategy
FMD	The Farm Management Deposit is an Australia agricultural program which allows producers to set aside some of their pre-tax income from production activities in high-income years, which can then be drawn when needed in future years
GARS	Global Ag Risk Solutions is a company whose flagship product is whole-farm insurance coverage; their insurance products allow farmers to add insurability to their crops
GHG	Greenhouse Gas emissions are gases that trap heat in Earth's atmosphere, a gaseous layer which, according to data from the European Space Agency, extends to 50 times the diameter of our planet
HLPE 15	The High Level Panel of Experts on Food (HLPE) creates science policy for the Committee on World Food Security (CFS), a platform for providing analysis and advice on its #15 point, food security and nutrition, in the interest of eliminating hunger worldwide
LEAN principles	Developed by Toyota's Taichi Ohno, these are defined as "1) defining value, 2) mapping the value stream, 3) creating flow, 4) using a pull system, and 5) pursuing perfection (Womack, Jones & Roos, 1990)
MWh	Megawatt-hours is a unit of measuring power consumption used at the utility provider level. One MWh is 1000 kilowatt-hours, or one million watt-hours

Schengen Area	A border-free travel zone made up of 27 European countries where citizens can travel freely without a passport or visa. Not all Schengen area countries are EU members, and not all EU members are Schengen zone countries
SDG2	Sustainable Development Goal 2: the United Nations' goal to have "a world free of hunger by 2030" worldwide
TEPAP	The Executive Program for Agricultural Producers: A leadership program for producers run out of Texas A&M University's Department of Agricultural Economics
UAV	Unmanned aerial vehicle; more commonly known as a drone

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Appendix A

Table of Contents (Benchmarking Report by Farmanco)

agoodco Farm

All Prices, Receipts, Costs and the Value of Assets and Liabilities in this Review are Exclusive of Any Goods and Services Tax (GST)

Business Review Index

Appendix B:

Nuffield Travel Summary

Figure 49: Map of Countries Visited on Nuffield Scholarship

Canada

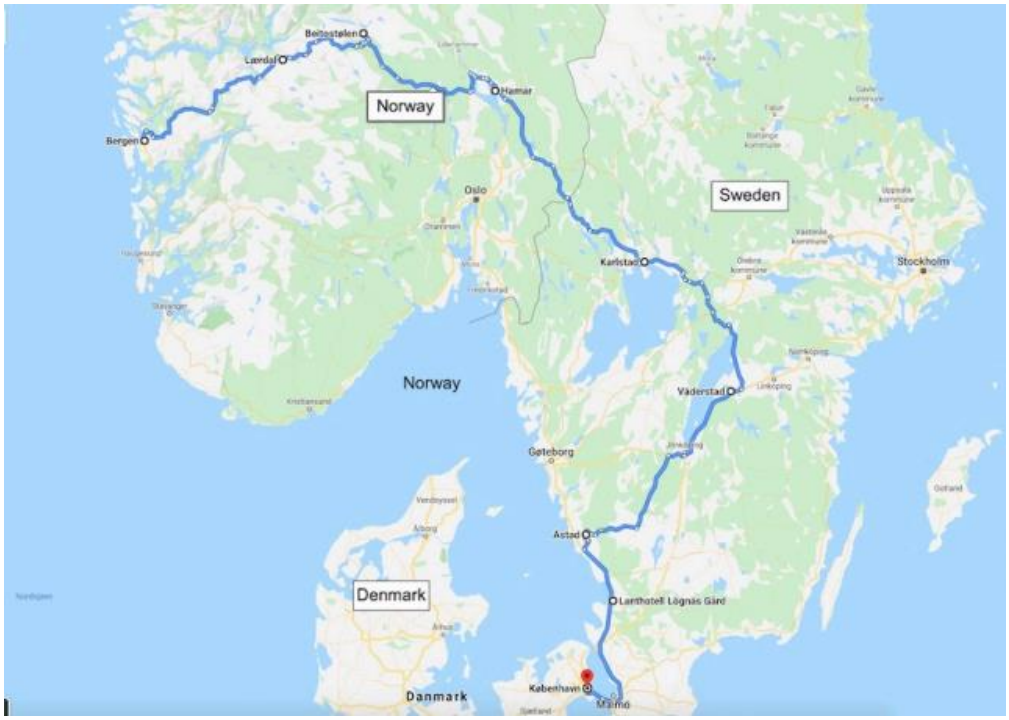
Gert and Peggy Brekveld	Dairy, OFA President	Thunder Bay, Ontario
Kyle Friesen	Cash Crop, Oat Processing Plant	Altona, Manitoba
Tyler Fulton	Beef, cash crop	Birtle, Manitoba
John and Barb Cote	Grain Farmers, Black Fox Distillery	Saskatoon, Saskatchewan
Kristjan Hebert	Cash Crop	Fairlight, Saskatchewan
Norm and Laura Shoemaker	Cash Crop	Mossbank, Saskatchewan
Rick and Marion Stamp	Cash Crop, Stamp Seeds	Enchant, Alberta
Darryl Possburg	Hogs	Saskatoon, Saskatchewan
Jaap Remijn	Potato Farmer	Taber, Alberta

Greg Stamp	Cash Crop, Stamp Seeds	Enchant, Alberta
Rod and Shelley Bradshaw	Carrot and Horticulture	Red Deer County, Alberta
Rob and Ang Semeniuk	Cash Crop	Smoky Lake, Alberta
Cammy Lockwood	Horticulture, eggs	Cobble Hill, British Columbia

Norway

Laerdal Farmers	Salmon sickness in Norway	Laerdal, Norway
Kari Signe Lysne & Richard Lysne	Berries, ag restructuring in challenging times	Laerdal, NO
Summer Farming Farmers, Cheesemakes,	Milk production in the mountains, Value chain challenges,	Hedalsstolen, NO
Representative of Norway Farmers	Innovation, political framework for summer farming	Hedalsstolen, NO
Noraker Gard	Trout farming, “rakfisk” brand	Aurdal, NO
Monica and Petter Klette	Dairy farming, grasslands, data management	
Hoel Gard	Grain, chicken, tourism	Hedmark, NO
Geno and Topigs Norsvin	Pig and cattle genetics	Hamar, NO
Ole Christen Hallesby	5 Pillars of Farm Management	Norway
Bjorn Gimming	Norwegian Farmers Union	Norway

Figure 50: Map of Route from Norway to Denmark



Sweden

Vadstena Monastery Hotel	Castles, monasteries, medieval buildings	Vadstena, SE
The Malmstrom brothers	Arable land, chickens, hens, green energy	Vadstena, SE
Vaderstad Ltd.	Swedish manufacturing in equipment, also in Canada and US	Väderstad, SE
Astad Vingard	Former dairy farm turned to vineyards and tourism	Åkulla Beechforests Natural Reserve, SE
Öströö sheep farm	Sheep production, vertically integrated with slaughterhouse, processing of meat and wool, retail	Tvååker, SE
Berte group: Berte Qvarn, Berte farm, SIA-Glass	Dairy farm, SIA-Ice Cream, breeding research,	Slöinge, SE
Lögnäs Lanthotell	Dairy and tourism housed together, arable	Laholm, SE
Kullaberg Nature Reserve	Steep cliffs, rocky outcrops	Kullahalvön Peninsula, SE
Food Hills – GroPro – Bjuv	Cooperative for green peas	Bjuv, SE
Söderåsen National Park / Kopparhatten	Largest unbroken area of protected woodland in Northern Europe	Ljungbyhed, SE

Lillgårdens Bi och Trädgård	Honey production	Höör, SE
Ove Karlsson	5 Pillars of Farm Management	Sweden
Lennart Nilsson	Federation of Swedish Farmers	Sweden
Swedish Agriculture Farm Show	Forestry, Agriculture, Seeds, Machinery	Jonkoping, Sweden

Denmark

Jakob Vesterlund Olsen	5 Pillars of Farm Management	Denmark
Soren Sondergaard	Danish Agriculture and Food Council	Denmark
Knud Vest	Former chairman of European Fur Breeders Association	Denmark
Kaj Munck	Hog Farmer	Denmark
Bregentved Gods	Solar panels, wind energy, machinery and cash crop	Faxe, Denmark Also farms in Poland

Spain

Jose maria Requejo Puerto	Hog Production and genetics	Madrid, Spain
Luis Prieto	Inga Foods, Nutreco	Madrid, Spain
Coren	Agri-Food Cooperative	Arrabaldo, Spain
Anprogapor	National Association of Pork Producers	Madrid, Spain
Incarlopsa	Fresh and Cured Ham Production	Tarancon, Spain

France

François Milhau	French Ministry of Agriculture, Departmental Directorate of Territories	Montauban, France
Yannick Laban	Beef Production, Cash Crop	Cyrille - Fléré-la-Rivière, France
Stéphanie Chanfreau	Vineyard, Winery, Tea	Basque Country, France
Julien Brant	Hog Production and Genetics	Thiouzee, France
Bertrand Tirel	Hog production, Consultant	Thiouzee, France
grégoire ferre	Cidery, Cash Crop, Organic	Les Mares, France

The Netherlands

Livar	Pork Farm, Processing, High Value Products	Limburg, Netherlands

Rick and Judith de Vor	Dairy Farm, Education Centre	Snelrewaard, Netherlands
Jan Kuijpers - Kuijpers Kip	Broilers and Hatchery	Grubbenvorst, Netherlands
Grianne and John Verwey	Pork Producers	Beerta, Netherlands
Annechien ten Have, Mellema Farms	Pork Producer, Humane Production	Beerta, Netherlands
Arnaud and Tim van Dijk	Greenhouse Peppers	Wevershoof, Netherlands
Jacob van den Borne	Potato Farmer, Data, Technology	Reusel, Netherlands

Zimbabwe

AM TOUR	PM TOUR	INDUSTRY
Colcom Factory Tour - Harare	CCC Pigs Operations - Phillip Odendaal.	Swine Production
Red Dane Dairy - Beatrice	Cattle Talks, 2-5PM (Jappie Jackson)	Dairy & Cattle
Imere Tobacco - Bruce Travers	Imere Conservation, Game Drive, Sundowners	Tobacco & Conservation
PHI - Corporate Farming Business. Goromonzi Farm Tour - Row Crops	PHI - Corporate Farming Business. ARDA Shamva, mixed farming set up.	Row Crops - Maize, Wheat, Soya
Phillip Weller - Drip Tech Blueberries	Marujanna Production & Flowers	Biologicals/Insects
Peter Shepard - Talk on Irrigation	British Embassy - UK Ambassador visit	Irrigation Innovations + lunch at beach house
Cattle Production Tour - Banket	Cattle Workshop	Cattle Production
Fly to Kariba (Kuva Air) - arrive 10:30	PHL Introduction/ICFA - CEO	Travel & ICFA Membership
PHL - Crocodile Farm Tour	Lake Harvest - Tilapia Farm Tour	Crocodile/Fish Production
Charara Estates (Bananas) - Steve Crawford, Nuffield Scholar	Travel to Zambezi - Bus Transfer	Banana Production - Mixed Farming
Chirundu Estates	Sugar Cane Production	

Australia

Michael Cains	Sheep Dairy, Cheese Processing and Specialty Restaurant	Knights Hill, NSW
Wade & Nicky Mann	Family Fresh Farms, Greenhouse managers, Nuffield Scholars	Peats Ridge, NSW
Scott Cameron, MLA head office	Group Industry Insights and Strategy Manager	North Sydney, NSW
Adam Williamson	Horse farm manager	Scone, NSW
Claire Booth	Lawyer, farmer - sheep, beef, arable	Geurie, NSW
Simon Turnball	Farmer – 4000 cattle backgrounding, 1000 head feedlot, 1600 ha cropping	Collie, NSW
Richard Quigley	Irrigation, cotton, arable	Trangie, NSW
Luke Cantrill	Organic Cherries,	Orange, NSW
Fiona Hall		
James Alexander	Sheep farm with father, consulting on regenerative agriculture	Cootamundra, NSW
Brent Alexander		Cootamundra, NSW
David Gooden	Large arable land holder and farmer	Lockhart, NSW
Murray Scholz	Sheep farming	Albury, NSW
Bernie Byrnes	Sheep, cattle, arable	Gunning, NSW
Sam Bond	Mixed irrigated crops and opportunistic feedlot	Cressy, TAZ
Rob and Kathy Henry	Mixed enterprise, irrigated crops, essential oils, canola pressing, dairy	Cressy, TAZ
Reid Fruits, Lockie Alright	Cherries	Jericho, TAZ
Daly Potato & Hellfire Bluff Distillery	Potato farm, value add, distillery	Marion Bay, TAZ
Kelvedon Estate Jack & Anna Cotton	Diversification, sheep and wool, adding vines, winery	Swansea, TAZ
Robin & Glen Thompson	Sheep farm, government	Scottsdale, TAZ
Foreco, Jim Wilson	Forestry industry in Tasmania	Scottsdale, TAZ
Ian Sauer	President Tasmanian Farmers and Graziers Association	Bridport, TAZ
Richard Sattler, Barnbougle Golf Course & farm	Farmer, developer, entrepreneur	Barnbougle, TAZ
Paul & Cate Bowman	800 cow dairy	Meander, TAZ
Rabobank	Agriculture in Tasmania and the banking industry	Meaner, TAZ
Caitlin Radford and Owen	Vegetable producer, young farmer, sheep production, horse riding ring and instructing	Moriarty, TAZ
Addison Family	Vegetable producers and exporters	Moriarty, TAZ

New Zealand

Neil Beaumont	CFO, Fonterra Dairy	Met in Rotorua, NZ
Hew Dalrymple	Cash Crop, Forestry, Livestock, Horticulture	Bulls, NZ
Andrew Waters	Capitol Investment Group	Fielding, NZ
Andy MacFarlane	Dairy, Leadership	Ashburton, NZ
Matt Iremonger	Willesden Farm	Christchurch, NZ
Pamu Farms (Landcorp Farming Ltd.)	Dairy, Government	Wellington, NZ
Jax Lee, Kings Truffles	Black Truffles	Canterbury, NZ
Rural Leaders Agribusiness Summit	Variety of speakers on climate, sustainability, farming in NZ	Christchurch, NZ
Hans and Jenny Klisser, Haldon Station	Sheep, Cattle, Deer	Mackenzie Basin, NZ
Cardrona Distillery	Distillery	Wanaka, NZ
Wilkins Farming	Deer, Beef, Sheep, Dairy, Grazing and Cropping	Waipounamu, NZ