

**Stratification in Canadian Agriculture:
Surveying the Implications**



Policy Concepts Paper

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Executive Summary

This paper provides an overview of economic-demographic trends in Canadian agriculture, and scratches the surface in considering the potential implications of stratification in primary agriculture.

Demographic trends present the following:

- a declining (but still large) number of small farms, for whom agriculture is not the primary source of household income, that are collectively insignificant as a source of farm cash receipts (FCR);
- a steep decline in the number of middle-sized farms and share of FCR. Previously, farming was the dominant source of income for these farms, but it appears that this has changed rapidly, and the most recent data suggests that off-farm income provides more income than farming does for these farms, and increasingly so.
- a much smaller number of large and very large farms that are growing in number, for whom agriculture is the overwhelming source of household income, that are the dominant source of FCR.

These observations are consistent with a collapsing middle of the economic distribution of farms, and threatens the community constituted by agriculture, with its commonality of interests and views, and institutions developed to support them. This situation behooves the industry and governments to engage in a renewal of institution building that can help to address the trend of stratification of farms, preserve a diverse community in agriculture, and in so doing address the related issues requiring collective action.

Introduction

Primary agriculture in Canada, like that in the US, Europe, and Oceania, is dominated by the frequency of relatively small, fragmented, family-owned businesses. This is clearly evident in a variety of respects. Data on the income status of farm households is a matter of consistent data collection and analysis, primarily through Statistics Canada. The fact that data on off-farm income of households reporting income from farming are even tracked is evidence that farming has been implicitly viewed as the default source of income for people living in rural agricultural areas, and that the farm enterprise is intrinsically connected to, or an extension of, households.

The countryside is thus both a workplace for farming and a residential area. Farms are treated as synonymous with families and households; this is embodied in the media coverage and communications on agriculture that prominently features family units on farms. This image is consistent with a countryside populated by many farm families working to succeed under the drudgery, difficulties- and joys- of farm life. Food marketing increasingly seeks to connect products at retail with this imagery of families in pastoral scenes involved in supplying downstream food products with qualities reflecting consumer attitudes toward this imagery. Agriculture is also an essential element of the character and economic development in rural communities.

Agriculture also constitutes a community unto itself at local, provincial and national levels- at the level of commodities, and through general farm organizations. Agriculture has developed many institutions to serve its constituency. Agriculture has its own media. Agriculture has its own politics. Agriculture has its own government ministries at both provincial and federal levels to advocate for it, in many cases its own quasi-judicial system to sort out disputes (involving such matters as drainage, producer treatment under business risk management (BRM) programming, farm products marketing, etc.), and has exemptions and/or special treatment versus the broader economy on the basis of its connection to households and communities in taxation and a range of regulatory provisions.

But the established connection among households, families, and farms is changing drastically. The trend toward fewer and larger farms in Canada is evident in public data since at least the 1941 Census. This is the product of any number of factors. One is a broadly educated and mobile workforce that includes farm people, in which the predominant trend has been movement of people from farms and rural areas toward local villages, towns, cities and urban jobs. This trend has been buttressed by improvements in agricultural technologies which, in addition to increases in output, have acted to save labour and essentially free up the workforce from farm work to allow for urban based, non-farm employment. This represents an important aspect of social and economic transition to a maturing economy.

An aspect of labour-saving technologies is the substitution of capital for labour. Investment in land and equipment as a substitute for labour is heavily entrenched in Canadian agriculture. But the capital necessary to invest and adopt the latest technologies accumulates over time and often contains a bias toward economies of size in which investment can most easily be made by the largest farms. Capital accumulation occurs over time and across generations of individual

families engaged in farming, such that individual farms can grow in size, asset base, and scope/complexity. This can be seen tangibly in the leveraging of equipment trade-in values; when a large farmer already has a relatively new scale-efficient machine, the cost of trading up to the latest technology can be marginal¹- however, finding oneself in this position may entail many years of prudent past equipment investment decisions and a supporting farm income/finance environment. For others, the same scale-efficient technologies or farm size may not be feasible or out of reach due to different past investment/disinvestment choices. This dynamic by itself can present an important barrier to new entrants. In the presence of a decline in the number of farms and increasing farm sizes, it threatens stratification in farm assets and output toward the established, already large farms.

Moreover, if investments in farm equipment can create a structural dispersion among farms, surely this is leveraged into competition among farmers for other residual farm assets- notably land; also quotas in supply management, and breeding stock. The most efficient machinery set allows the owner to effectively derive more value out of an individual parcel of land to rent or purchase on an operating cost basis; if this is coupled to large existing land holdings then the purchase/rent cost for the large farm can be dollar cost averaged against existing land holdings.

If Canadian agriculture has evolved in a manner similar to this- still overwhelmingly dominated by family businesses that are mostly small and independent, but with an asset and output structure somewhat inconsistent with the grassroots image that commonly prevails in some form among farmers and the general public, what are the implications- for agricultural marketing, asset and technology adoption, finance, community, and agricultural and food policy?

This policy concepts paper provides an overview of economic demography in Canadian agriculture, and scratches the surface in considering the potential implications of stratification in primary agriculture.

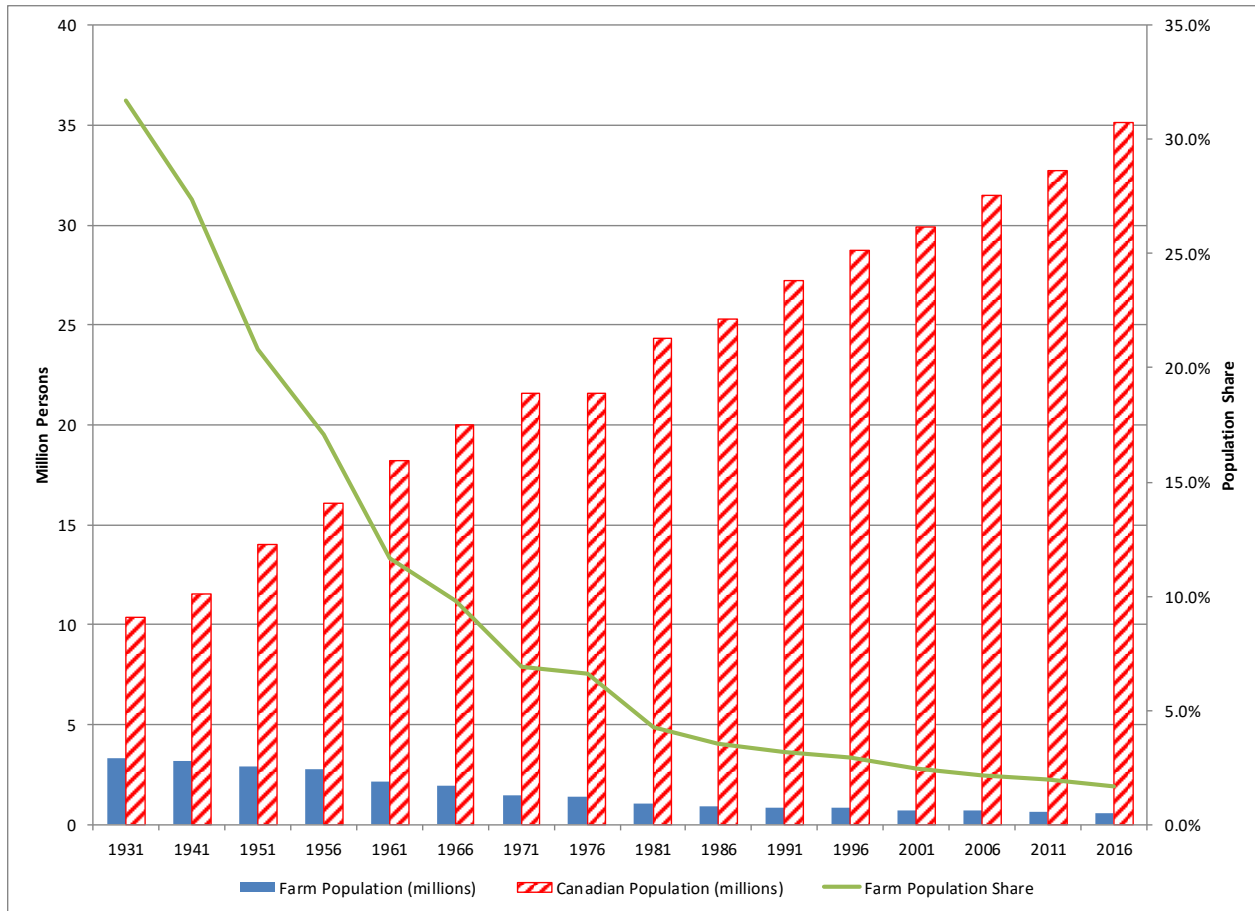
Selected Economic Demography of Canadian Agriculture

Figure 1 below provides some context on the status of the farm and non-farm population in Canada. In the 1931 census, the farm population in Canada represented 32 percent of the total population. This decreased significantly, during and following the Second World War, but was still about 10 percent as of 1966. By 2016, the farm population was less than 2 percent. The relative significance of the farm population differs significantly across provinces, especially in the prairie provinces and Prince Edward Island where the share of farm population is somewhat higher, but the essential trend is similar.

Another aspect is the proportion of the farm population in the overall rural population. In the

¹ This is of the asset fixity theory in agriculture proposed many years ago by Dale Hathaway, Glenn Johnson, Luther Tweeten, and others. The observation articulated by these authors was that the difference between the acquisition and resale price of farm inputs would create fixity in supply (better to use it than sell it back). Here we suggest that the effective price of farm inputs is lower for the large farms with an existing asset base than it is for the new or small (leverage existing assets as trade-in value or cost averaging)

Figure 1 Farm and Total Population, Canada



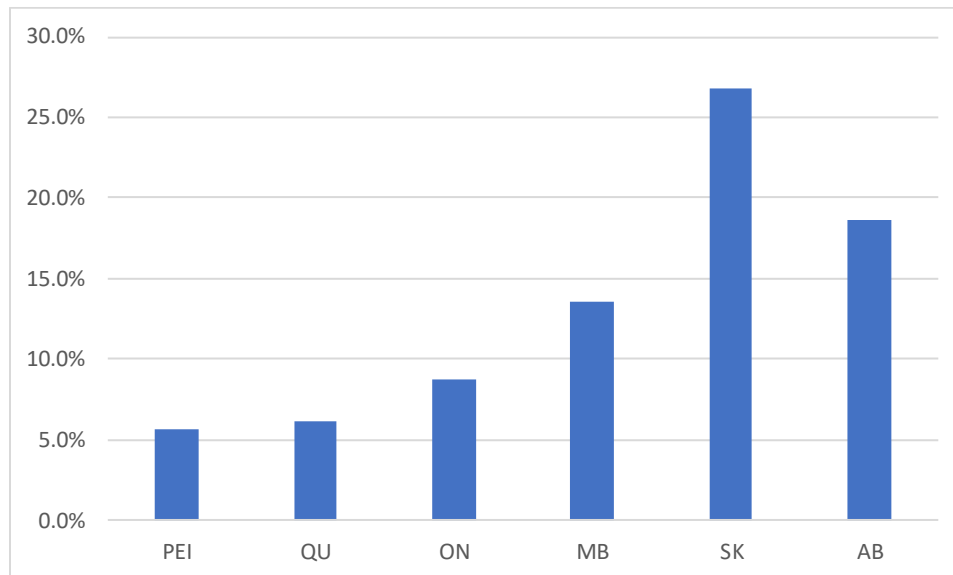
Source: Statistics Canada

period of settlement, the rural and farm population would have been almost synonymous, but this has evolved greatly. Figure 2 below summarizes 2016 data on the farm population as a share of the rural population.² In the data, the farm population includes farm population residing in population centres. The data show that in eastern Canada, the farm population represents less than 10 percent of the rural population. The share is higher in the west, with up to 27 percent in Saskatchewan. However, the farm population is actually a minority of the rural population throughout the country.

The data are consistent with economic stratification as an ongoing aspect of change in agriculture. First, the number of farms in Canada is in long-run decline, consistent with trends in the farm population. This trend has been in place since at least the 1941 census. In turn, it interfaces with relatively stable, or much less rapidly declining, arable land base. The clear

² A population centre has a population of at least 1,000 and a population density of 400 persons or more per square kilometre, based on population counts from the current Census of Population. All areas outside population centres are classified as rural areas.

Figure 2 Share of Farm Population in Rural Population, Selected Provinces, 2016, both sexes



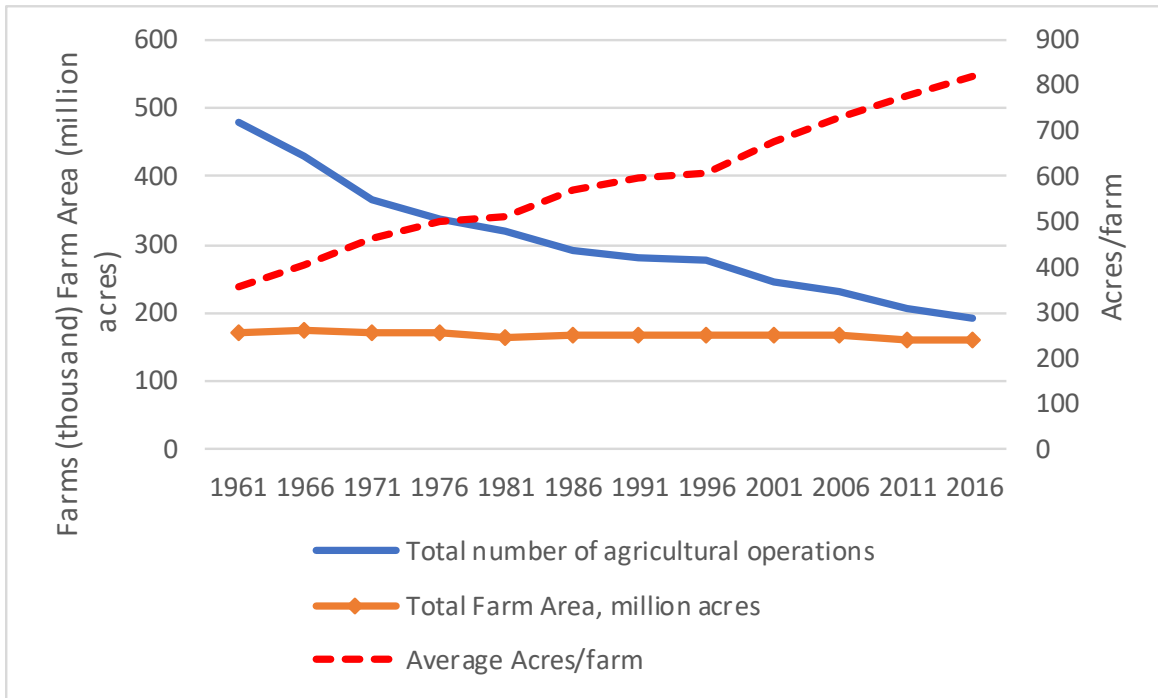
Source: Calculations based on Statistics Canada. Table 32-10-0012-01 Number of persons in the total population and the farm population, for rural areas and population centres classified by sex and age

implication is that average farm sizes are increasing from the perspective of either physical or economic size. Figure 3 provides the background. Since the 1961 census, the number of farms has declined from just over 480,000 to less than 200,000. Over the same period, the farm land area declined from about 173 million acres to 159 million acres. The implication is that the average acres per farm increased from 359 acres to 820 acres.

A 2021 policy note explored the dynamics and significance of these trends (Mussell and Hedley, 2021). The data referenced in it show that, up to the 2016 census, increases in average (economic) farm sizes have come to be dominated by expansions in large and very large farms, largely at the expense of middle-sized and small farms. Essentially, we have a relatively small number of large and very large farms that are growing rapidly in both number and economic significance, middle-sized farms declining rapidly in both number and economic significance, and a large number of small farms that are also in decline- both in number and economic significance. The dynamic driving these trends does not appear to be a plodding, long term trend driven by step-by-step increases in farm sizes over time leading to larger farm sizes on average. In aggregate, the large farms are getting larger, and other farms are exiting- perhaps with some diversity in small farms in which there is both entry and exit within an overall decreasing trend in number.

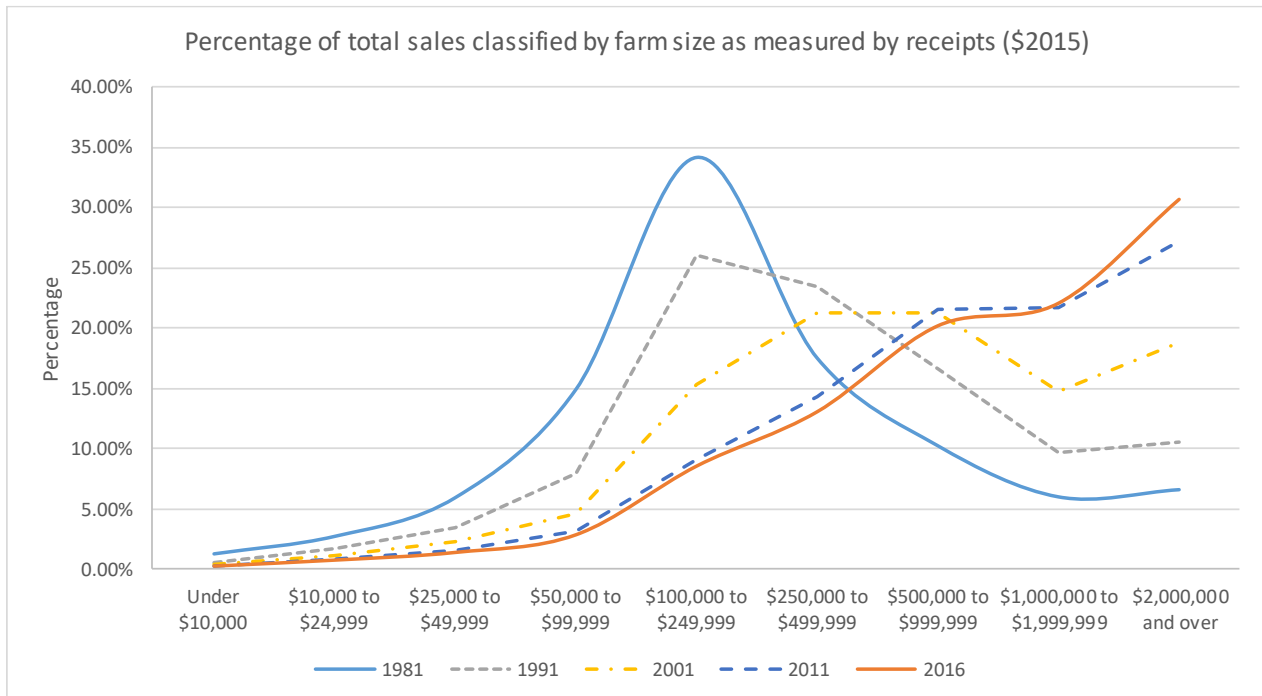
Some evidence is provided in Figure 4 below, reprinted from Mussell and Hedley. It relates the frequency of farms by farm cash receipts (FCR) category to their economic significance in terms of shares of total FCR, adjusted for inflation. The graph is constructed by multiplying the data

Figure 3 Selected Demographics of Canadian Agriculture



Source(s): Statistics Canada CANSIM tables 004-0002, 004-0204, and 004-0203

Figure 4: Share of Farm Cash Receipts in Canada by Economic Size, Census Years, \$2015



number of farms in each FCR size category by the midpoint of the category; for the open-ended category >\$2 million in FCR, a representative value of \$3 million was assumed.

The graph suggests that, in 1981, the bulk of Canadian FCR (more than one-third) was accounted for by farms with sales of \$100,000 to \$250,000, and the shares of farm sizes both larger and smaller than this fell steeply. This general structure with density in the middle-sized farms was still evident in 1991 census with a concentration of FCR in the mid-size, but with the “mid-size” shifting to the right to be larger, and with the shares of larger farms clearly increasing. The 2001 census saw a further shift to the right, still with a discernable middle in the distribution around the \$250,000-\$500,000 and \$500,000- \$1 million in FCR. Since the 2011 census the middle of the distribution has collapsed, with the FCR share concentrated in the largest farm segments.

These observations are consistent with a similar analysis of Canadian farm structure in a fellows’ paper by Weersink (2018), which develops a very similar illustration to that in Figure 4. Similarly, Bunge (2017) writing on the evolution of US primary agricultural structure, observes that “food production is increasingly handled by the larger farms, which can be more financially secure. It also fuels a cycle in which size begets size, further transforming the rural economy. Smaller-scale farmers struggle to expand their operations to become profitable.” The Canadian data suggest a similar situation.

It can be argued that if additional larger economic size categories were added to the right in Figure 4, a new (shifted) bell-curved shaped pattern would re-emerge. However, doing so begs questions of interpretation. The patterns observed above are not due to inflation, so they are real changes in size/structure/intensity of farm businesses. If our benchmark reference is that farmers are regarded as members of the economic middle-class in Canada, a middle of the distribution of farms that has actually shifted to somewhere well above \$2 million in FCR is simply out of synch, and practically irrelevant compared to the situation of middle-class households more broadly. From this standpoint, the middle of the farm size distribution is practically in rapid decline.

Another criticism of the observation of a “disappearing middle” in the economic size distribution above is statistical- that the middle of the distribution is defined by arbitrary size categories that ignore variation within the size categories. To illustrate, Foster and Wolfson (2010) explain that “inequality and polarization increase when the distance between those above the median and those below the median rises.” The data to measure and assess the farm size distribution over time using this approach is not immediately available; however, a reviewer suggests that even by the mid-1990’s, this method applied to the available data at that time would have suggested that the middle was beginning of the farm size distribution was beginning to disappear. This presents an opportunity for future inquiry. However, the statistical criteria for evaluation is limited to a generic mathematical definition of significance; it lacks the context for FCR. The available data and a broader perception of materiality suggest that the middle of the distribution is declining and that the shift toward the large and very large is accelerating.

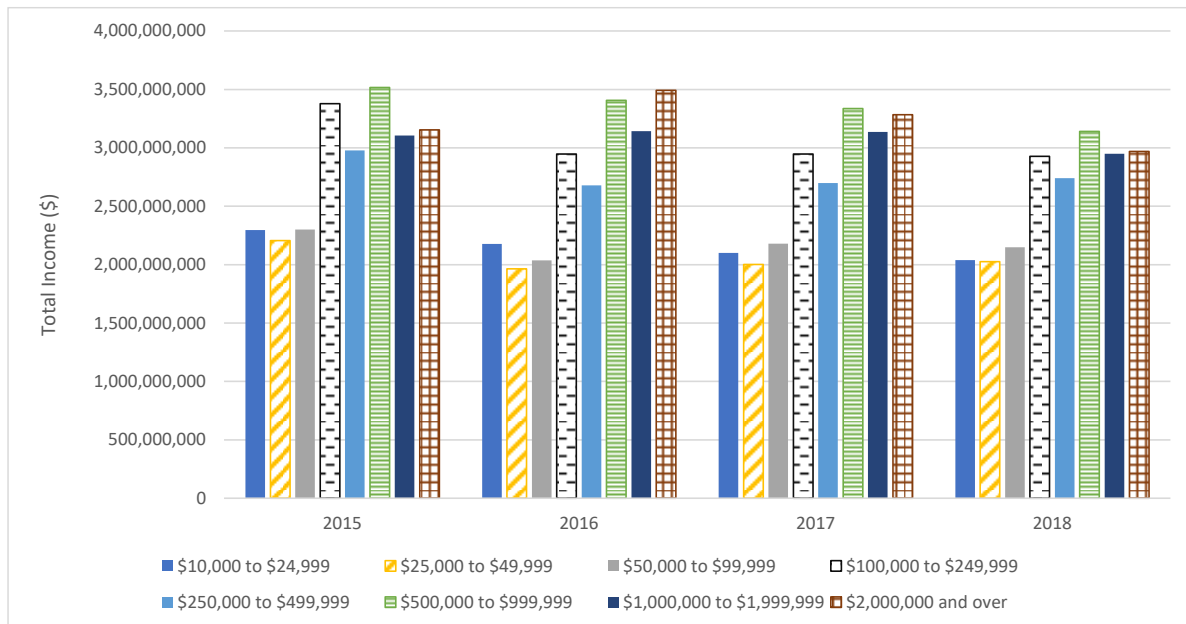
Figures 5 and 6 explore total farm household income based on information from farm income tax filings. Figure 5 presents aggregate household income for households reporting farm income,

across a range of farm cash receipts categories, between 2015 and 2018. It shows that total income in households reporting farm income was surprisingly stable across size categories, with a downtrend in aggregate household income among the small categories 2015-16, and an increase in income among larger farms 2015-16 followed by a decrease in 2017 and again in 2018. The trends potentially reflect a number of factors (1) fluctuation in the number of farms in the category over time, (2) fluctuation in farm operating income, and (3) the share of total household income from farming versus off-farm income.

Figure 6 provides additional interpretation. The figure shows that the share of total household income provided by off-farm sources declines consistently with increasing farm cash receipt categories. In the small categories, household income is overwhelmingly provided by off-farm income. The smallest size farms experienced a loss from farming, so the percentage of off-farm income to total household income exceeds 100 percent. Only farms exceeding \$500,000 in FCR had less than 50 percent of total household income from farming. The share of total household income from off-farm sources increased the most rapidly in the \$250,000 to \$500,000 FCR category, from 54 percent in 2015 to 61 percent in 2018.

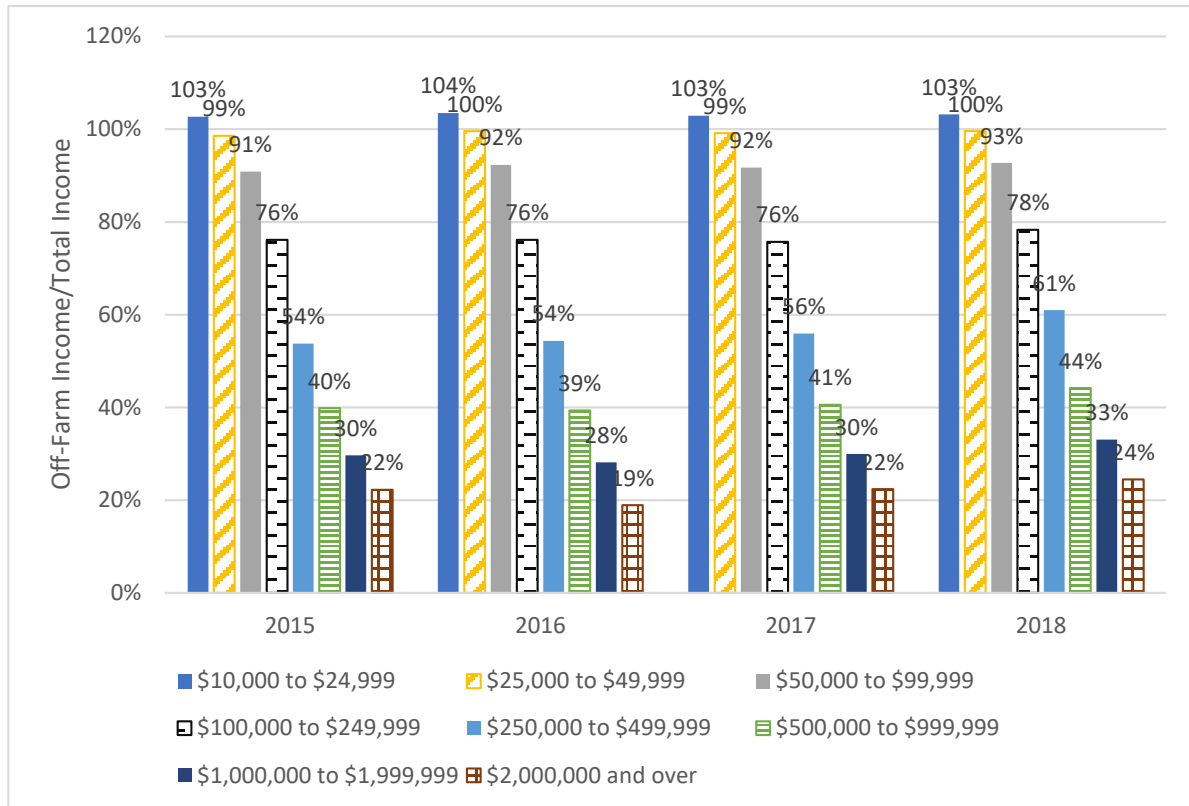
Thus, in aggregate, the stability observed in household income of small farms is driven by off-farm sources, and it would seem unlikely that adverse economics in agriculture would cause the smallest farm segments to shrink much further. The segments in excess of \$500,000 in farm cash receipts are much more dependent upon farm income as a component of total household income and are more vulnerable to adverse farm economics. However, it would seem that the \$250,000-\$500,000 segment is perhaps the most vulnerable, as the share of off-farm income as a share of total income has increased most rapidly and is recently well over 50 percent.

Figure 5 Aggregate Farm Household Income by Revenue Class, Canada



Source: Statistics Canada. Table 32-10-0213-01 Total income of farm families by source of income

Figure 6 Off-Farm Income as a Share of Total Farm Household Income by Revenue Class, Canada



Source: Statistics Canada. Table 32-10-0213-01 Total income of farm families by source of income

Agriculture as Community in Canada

Oxford bibliographies defines the essential components of a community³. It defines a community as (1) a group of people that interact with one another, (2) the interaction occurs in a bounded geographic area, and (3) the members of the community share a set of common values. Increasingly, the concept of community seems more related to components (1) and (3); the people one interacts with and share values in common. With the internet and social media, etc. community is no longer limited to a bounded geographical area. Brooks (2019) emphasizes a common project, a common identity, a common historical narrative, and common loyalty as the core aspects of community. Other aspects of community relate to a sense of belonging together across a range of interests through which the members interact.

Experience suggests that the essential common project of agriculture is to build farms, rural areas, and support networks that sustain and reward farmers, and attract and sustain the next and future generations of farm families and community members. Many of the key pressures felt by farm people are shared in common- such as the annual struggle with pests and weather, seasonality, importance of family and working together, and remoteness- both in terms of

³ <https://www.oxfordbibliographies.com/view/document/obo-9780199756384/obo-9780199756384-0080.xml>

location, and distance from markets that impact them. The perception of a common enemy- perceived abuse or unfair competition from purchasers, input suppliers, and other countries- can galvanize farmers. Communities are also shaped by commonality of geography and climate, and the conditions established by these factors- soil type, topography, growing season, etc., which in turn define the types of farming viewed as feasible and a culture adapted to support farming practices appropriate to these conditions.

Broadly speaking, farmers implicitly perceive a shared social history. Farmers in Canada are neither serfs nor aristocrats; they are descendants of immigrant commoners, mostly from northern Europe. The ancestors of current farmers came to Canada motivated by the prospect of owning their own land, the escape from poverty and/or political or religious persecution, or displacement by war. In many cases they were settlers, prepared to endure the difficulties of frontier or pioneer life; in others they were welcomed to Canada as displaced persons in the wake of two world wars in which Canada was a combatant and liberator.

In a number of respects, farmers have succeeded in working together to overcome issues of income instability, market power of processors and input suppliers, and the many practical struggles of farming. Farmers can disagree among themselves on many issues but faced with an attack from the outside (e.g., activism related to animal rights, opposition to genetic technology, egregious subsidies enacted by other countries, etc.) they readily pull together to mount a spirited defence.

These aspects are consistent with agriculture as a core element of local rural communities, and as a community unto itself- especially at the provincial level, with so much of the interaction among farmers occurring under provincial government mandates. It has also had to evolve with extensive population/demographic change. The years prior to and following the Second World War were formative in the organization of many of the institutions that serve the agricultural community today. These include producer marketing boards; organizations to support farmer education/extension such as breed associations, soil and crop improvement associations, womens' institutes, and farm safety associations; local farmers' unions and their federations; farm supply and marketing cooperatives; quasi-judicial alternate dispute resolution institutions; and organizations to support farmers in difficulty such as farm debt review boards. These have been highly robust, owing to demographics- sheer numbers of farmers and high participation rates- and with issues facing the farm community popularly shared with great awareness.

It is really only recently that a wide range of groups that are not part of agriculture have taken an active interest and pursued their agendas with respect to food quality, diet, meat, animal and plant disease, antibiotic use, environment, etc. These issues were not common at all in the initial settlement period, right up through most of the 1950s and 1960s. These groups have become part and parcel of a new "community" surrounding agriculture today.

Some Observations

Canadian agriculture, either in relation to local communities or as a sector appears to satisfy conditions of a community. The factors enabling and supporting this community are well established. However, the data on evolution of farm demographics suggest accelerating

challenges to the agriculture community. First, the farm population has become sufficiently small that in some areas, critical mass to support the existing infrastructure for an effective agricultural community and its facilitating organizations could be limiting. Second, in some areas, especially in eastern Canada, the extent to which agricultural interests effectively represent rural interests appears weak. Third, the process evolving toward fewer, larger, farms does not appear to have been step-by-step; farms across the size spectrum have not each increased incrementally or smoothly in size over time. Rather, large farms have become larger and the mid-sized and small farms have declined- either by getting larger and moving into larger size categories, or by exiting agriculture.

The rapid evolution to the current structure creates difficulties from a community perspective. As the distribution of farms pulls apart from the economic significance of farms, it is likely to erode the cohesive basis for achieving consensus and effective action among farmers. Ostrom *et al* (2012) note that “a culturally homogeneous and relatively stable community where people have strong reputational and social ties and a commitment to long-term development is less likely to invite free-riding”- the converse is that cultural heterogeneity, as evident in a bifurcated distribution of farms is less cohesive, and more prone to free-riding. An illustration is presented by Zusman (1982), comparing the stability of Israeli farm cooperatives in developing cost allocation rules across members. Even in the simplest case in which the cooperative’s objective is given and all there is for members to do is agree on a cost-sharing rule, essentially the farm cooperatives that were the most robust are those with very similar members and member farms. Even a small minority that differ from the rest can undermine the stability of the cooperative; this worsens when the members must also choose an objective. Libecap (1994) illustrates a similar situation, documenting the difficulties of the US orange industry to establish a federal marketing order for oranges, largely based on the differences between California and Florida, and within Florida, in relation to orange varieties, production conditions, farm structure, and competitive culture.

The economic dominance of the very large farms serves to weaken the link, accepted implicitly in the past, between farms, rural households and families, and ownership/management of land. Farms with FCR ranging well over \$2 million, even though almost all are likely to be family-owned, can carry the appearance or connotation of an industrial or corporate entity. As this occurs, some may reasonably begin to expect that farms should be regulated much more like corporate or industrial entities, and question the preference and exemptions for farms to certain regulations ranging from labour, to transportation, to tax treatment, etc., that embody the received view of farms as extensions of the household.

Some Implications

As these trends continue to develop, increasing strains can be expected to impact a range of aspects.

Municipal Governance and Planning

The established systems of governance in rural municipalities have assumed that households are largely synonymous with land parcels, which effectively linked property taxes to households and

use of services. This has evolved over time as rural communities have accommodated subdivision and encouraged population growth in towns requiring more land for housing and local non-farm business development.

With this acknowledged, consider how matters would practically work in agricultural areas if land ownership were to become very heavily concentrated within only a small subset of citizens in a municipality. The needs for municipal infrastructure from agriculture would not be perceived by the mass of residents/voters, and might not be popularly supported. It would create a widening gap between the assessment of taxes based on property used to fund municipal infrastructure with actual demand/use of municipal facilities. This could appear unsustainable, yet it is likely that this has already begun to occur in some rural municipalities in Canada.

Rural municipalities operate on a range of implicit assumptions regarding the needs and role of farms. A subset of these relate to roads, lot sizes and lot severance, and municipal taxes, services and schools. The base level road network managed by municipalities are concession roads- roads originally designed primarily to handle traffic accessing land parcels (concessions). This has evolved considerably, and new pressures exist from new, much larger machinery used by some of the larger farms- such as the 80 foot seeder, >1000 bushel grain cart, and the 10,000 gallon liquid manure spreader- that pressure weight limits and reasonable transport widths on country roads. Greater levels of passenger vehicle traffic using country roads as alternatives to highways can exacerbate the situation. The consolidation of municipalities in some provinces, often opposed by farmers and older retired residents, weakens the close interaction among residents and municipal leaders and services.

Farms are technically taxed at the residential rate, but with the portion of land not used for house and yard subject to tax rebate (e.g., in Ontario the farm tax rate rebate is 75 percent). This preferential tax treatment would assume that farms support households that contribute to the municipal tax base in other ways, such as through support of local businesses. Farm lots were originally sized to support a farm household- commonly 100 acres in eastern Canada, and sections and quarter sections in the west. Economic farm size long ago surpassed this size and at greatly increased scale there is a desire to sever off unused farmhouses, or conversely to demolish. The juxtaposition both threatens the municipal tax base, and pressures the logic of tax rebates (at least at existing levels).

Periodically we are reminded of the strength in the relationship between households and farms. It was illustrated several years ago when Alberta developed Bill 6, workplace safety standards and rules for farms in the wake of tragic farm accidents involving children. Bill 6 was immediately wildly unpopular with farmers and evoked a strong and belligerent reaction from the Alberta farm community, who objected to Bill 6 as overreach into their private households and families, and as creating burdensome costs. The legislation has since been repealed.⁴

⁴ For more information see realagriculture.com coverage <https://www.realgrowth.com/2019/11/bill-6-to-be-repealed-alberta-introduces-the-farm-freedom-safety-act/>

Transactional business

Much of the business done by agriculture in local communities in the past has been transactional, as opposed to centralized sales from urban areas to customers located in the countryside. The need has always existed to have local physical locations and sales representation and to build networks and serve customers in rural areas. This model is consistent with a large number of relatively small customers buying locally best accessed within or through the local community network. For example, sales of a given brand of farm equipment in a region is heavily dependent upon the reputation and network of the local dealer; farm machinery dealers exhibit equipment at local fairs to promote and build sales networks with farm families in attendance.

As fewer, larger farms become economically dominant, the costs of search and service to individual customers declines, and farm customers can be more readily accessed from company headquarters, with the added benefit of getting to forge direct relationships with customers themselves. Effectively the value of the network and relationships provided by the local dealer has declined. Bunge (2017) notes that “[local] farm-supply retailers and grain companies are pressured, since larger farms use their size to wrangle better deals.” Some customers will prefer this structure as it could be seen as eliminating the middleman. However, to some extent it weakens the local economic development spinoff from primary agriculture, and the integration of agriculture with the community.

Expectations for Technology Adoption

Remarkable technologies are emerging that will improve (dramatically in some cases) the productivity of residual inputs in agriculture, the accuracy in the use of inputs, and the consistency and tolerances for quality in farm products supplied by farms. These will be based on robotics, artificial intelligence (AI), advanced information telecommunications (IT), emerging genetic research, etc. In the past, agricultural innovations faced a mass market- for example, Henry Ford saw farm equipment as intrinsic to his company’s business just as were cars, as he viewed both as mass markets. Clearly this is long gone, and it is unlikely that many of the next generation of technologies and their associated benefits will be adopted by the preponderance of farms. This affects the expectations we should have of income, financial, and operating/marketing performance of farms going forward, and increases the likelihood of further consolidation.

The cost of at least some technologies in development will be prohibitive for many, either directly or indirectly. Anecdotally, when the costs of headers are included, it is likely that the cost of a new Class 10 combine could approach \$1 million. While not everyone needs a machine such as this, it means that both its capacity and technical sophistication will be inaccessible to most. As discussed further below, finding a practical resale market for this equipment may prove difficult. New technologies that utilize robotics, AI, and IT may not be so cost burdensome, but to take full advantage of these technologies throughout a farming operation will incur infrastructure and secondary adoption costs that could prove prohibitive, or conversely

favour larger farms that have the supporting overhead.⁵ Some aspects of what is regarded today as basic infrastructure- such as reliable internet- is still constraining in many rural areas.

Mussell and Hedley (2021) highlighted concerns about agricultural technology investments under a bifurcating farm structure. Due to economies of size, the largest farms are best positioned to make new investments in the best technology. These investments are partially financed by trade-ins of used equipment, mostly purchased by the middle-sized or small farms. However, the middle-sized and small farms are in decline, weakening the demand for used equipment/technology, which effectively increases the net cost of investment in new equipment for large farms. The implication is that there is a complex dependence among farms across sizes, and that the decline in mid-sized and small farms also bears a cost on the large farms.

Rather than mass adoption, actual farm demographics suggest that it is likely that some of the most innovative technologies, especially in farm machinery, will only appeal to a narrow segment of the large and very large farms. This, in turn, will further accelerate farm consolidation.

Food Democracy and Sovereignty

In some areas and among some groups, there is a strong ethos that food choices are highly personal and individual, and each has the right to consume and produce his or her own. With few exceptions, there is nothing preventing this in Canada or in any province, with the practical limitations of a northern climate and limited growing seasons acknowledged. The market has provided incentives for tremendous differentiation and segmentation of farm and food products to serve many different preferences and esoteric wants.

Yet the reality is that for the farming segment atop the food supply chain, the food supply is in relatively few hands. Extensive fragmentation and differentiation to meet any and all local and niche preferences is not practically possible. It is dependent upon the economics facing the increasingly narrow subset of large farms producing the bulk of farm outputs that lead into the food distribution and processing elements of the supply chain. Those rejecting this supply or desiring a departure from it may have the option of own-use or small scale to produce it themselves, but this is heavily limited by economics. Small scale farming can be rewarding but is also exceptionally demanding, and many who enter it subsequently choose to exit or fail at it, for many of the reasons articulated above.

Agricultural Marketing and Liquidity

Free enterprise and competition are at core of Canadian agriculture, and it embodies a long-standing and ongoing drive for efficiency in the food system. However, the efficiency of markets is premised and dependent upon certain underlying conditions. One of these is liquidity- the ability for buyers to find willing sellers at volumes they wish to deal in, and vice versa, without these transactions significantly affecting prices. The organization of agricultural

⁵ There are also notable exceptions. For example, robotic milker technology has been demonstrated to be amenable to small dairy farms, with a single robot capable of milking 60-70 cows. Even then, there are economies possible from combining multiple robots on a single farm- creating economies of size favorable to larger farms

marketing into (largely) commodities with associated standard specifications and centralized markets that are the focus of buying and selling activity serve to facilitate liquidity in markets. Futures markets and large centralized cash markets are examples, as are marketing intermediaries such as cooperatives, some farm organizations and marketing boards.

Consolidation of farming operations directionally undermines liquidity, with fewer transactions and greater volumes. It seems unlikely that even a dramatic evolution toward larger and very large farms in Canada will threaten the functioning of futures markets dependent upon liquidity like the Chicago Mercantile Exchange; however, it could be very different in local cash spot markets for farm inputs and outputs. The institutions and market intermediaries established to facilitate liquidity are likely to come under increasing strain from the pressure of the large who chafe at not being able to effectively market volumes that are relevant to them, just as the smaller and medium sized farms worry about accommodations made to facilitate the large that they perceive as weakening liquidity.

The model of Modern Agricultural Marketing articulated by Sexton (2013) seems to anticipate this development, focusing on food processing. It posits that size economies have generated concentration that has undermined spot markets, and that in the move to supply chains in lieu of spot markets, with contracting costs largely independent of volume, processors will increasingly contract with the largest producers. The caveat is that processors are increasingly interested in relationships with producers that deviate from commodities and are specific to their needs in terms of product, process, etc. The opportunity for the small or medium sized producer is to perhaps be better at providing these specific attributes requested by processors than the larger farms that operate in bulk uniform volumes, and thereby secure market access.

The paradigm of Modern Agricultural Markets is a great improvement in understanding the contemporary realities of farm products marketing. However, while focusing on food processing and handling, it would seem to underestimate the extent of consolidation in the farm segment, and also the development of new technologies that assist in meeting the idiosyncratic product specifications of processors- most readily adopted by the large farms. The implication is that the evolution from traditional farm product markets based on liquidity in spot markets to more aligned supply chains under contractual market arrangements will probably only entrench existing trends in farm structure, in which the large and very large grow at the expense of the mid-size and small farms.

Discussion: Potential for Institutions and Collaboration

The trend toward fewer, larger farms in Canada is anything but new. Moreover, the dramatic movement of farm people off farms to urban work in the decades following the Second World War did not “break” the agricultural community in Canada. From its peak in 1931, almost 3 million Canadians left farms for urban areas, a very significant proportion of the Canadian population at that time. This occurred without creating widespread disruptions in food availability or increases in food prices. Farm prices decreased, and farm revenues actually increased. The upheaval and migration of people leaving farms for urban centres did not impair

Canada's economic growth- it enhanced it by supplying an educated workforce that diversified the Canadian economy (Mussell, 2017).

So why raise concerns and enumerate the implications of farm demographic trends today? The sections immediately above document the potentially profound effects of a deterioration in the agricultural community. And there are important departures from the past that warrant attention.

First, in the more distant past the increase in average farm sizes seems more indicative of a plodding or step-by-step trend in which individual farms expanded by acquiring others to accommodate the farming aspirations of a younger generation wishing to farm, and to increase returns by (for example) better utilizing existing capacity. No doubt these motivations still exist, but it would seem that for many mid-sized and small farms today the ability to expand to create the threshold scale for the farm to viably continue into the next generation is simply beyond them- a legacy of scale, economics and past choices on expansion investment made (or not made). When farms were more uniform in their size distribution, as in the more distant past, this was probably much less of a factor. What is clearer today is that the growth in average farm size is driven by expansion in already large farms, and contraction in medium-sized and small farms, leading to a more bifurcated distribution. Compared with the past, this is new.

Second, even with the large numbers exiting agriculture in the past, there was always a critical mass to sustain a viable and cohesive community. The farm population has been sufficient in magnitude to maintain the fundamental institutions that have carried on agriculture and facilitated it as a community. However, the combination of the collapsing number of mid-size farms and growth in the already large farms will, at some point, cross a threshold in which insufficient numbers and less commonality of view will threaten the capacity to effectively resource institutions and thereby weaken agriculture as a community. Much as many small town service clubs are challenged to find volunteers, demographics will make it more difficult to find 4-H club leaders, directors willing to sit on agricultural organization executives, and association executive members prepared to deal with wedge issues among farmers fragmented across large versus small/medium fault lines.

Third, the disruptions that faced Canadian agriculture in the past gave rise to many institutions designed to address the collective problems of agriculture, and to sustain its community in the face of great change. However, the broad willingness to collaborate in new or renewed agricultural institutions appears on the wane, perhaps just as they are badly needed to sustain the agricultural community through the bifurcation in farm demographics.

In a Nuffield Scholar report, Mark Brock (2021) addressed the concern that “the operating environment raises the question, how do we strengthen overall farm viability no matter the size?” His report documents the consolidation toward fewer larger farms in Canada and looks at the role collaborations could play in helping farmers overcome these challenges. Brock observes a resistance to collaboration among many in Canadian agriculture, and finds that cultivating a range of human elements, such as humility, trust, and open-mindedness are very important factors, and a precursor to the structural factors impacting collaboration such as group size and diversity

in overcoming resistance to collaboration, and, by extension, new institutions to address disruptive change in agriculture.

Brock's findings are consistent with the observation that willingness to take up collective action initiatives in Canadian agriculture has declined. It seems that we have tended to fall back upon narrow reliance on rugged individualism and markets to sort out coordination and allocation problems in agriculture. It is a critical gap as, quite apart from the facilitation of community in agriculture, we are confronted by numerous specific issues that are matters of collective action by nature. Management of herbicide resistance; provision of habitat for endangered and other species; adoption of best practices in agronomy/soil health; and animal husbandry standards immediately come to mind as examples.

Agricultural institutions will increasingly need to embody a view that the vibrance of the agricultural community as a something akin to a common-pool resource- in which the benefits of the community are shared, but are fragile and can be undermined or weakened by individual/opportunistic behaviour. As an illustration, writing on herbicide resistance, Erwin and Jussaume (2014) argue that herbicide resistance satisfies the definition of a common pool resource "in the form of the weed gene pool susceptible to dominant herbicides". Many of the tangible elements of the agricultural community- exemption to certain regulations, favorable tax treatment, agricultural education, etc., are collectively beneficial, from the standpoint of freedom to operate and from low costs of operations. However, they are potentially undermined by a perception that a dominant subset of the industry is sufficiently removed as an extension of the household that the premises supporting the exemptions no longer hold, and thus can be removed with little effect. But in reality, the effects would be wide-ranging.

This situation, understood properly, behooves the industry and governments to engage in a renewal of institution building that can help to address the trend of stratification of farms, bridge the gaps, and preserve the diverse community agriculture has created for itself, and in so doing address the related issues requiring collective action, such as herbicide resistance.

Conclusion

The shifts in the economic demography of Canadian farms are leaving us with bifurcated distribution:

- We have a declining (but still large) number of small farms, for whom agriculture is not the primary source of household income that are collectively insignificant as a source of FCR. These farms are generally less threatened by farm economic downturns, and the extent to which the farm is an extension of the household is a matter of individual preference;
- We have a much smaller number of large and very large farms that are growing in number, for whom agriculture is the overwhelming source of household income, that are the dominant source of FCR. Downturns in farm economics are a threat to these farms. It is likely that the farm is, or at least was, an extension of the household on these farms- but either way the size and sophistication of these farms could serve to sever the apparent connection between the household and the farm.

- There has been a steep decline in the number of middle-sized farms. Previously, farming was the dominant source of income for these farms, but it appears that this has changed rapidly, and the most recent data suggests that off-farm income provides more income than farming does for these farms, and increasingly so. Yet, farming remains a sufficient share of household income that these farms are threatened by economic downturns in agriculture. It is reasonable to expect that farming remains effectively an extension of the household for these farms, even as off-farm income grows in its significance.

This collapsing middle of the distribution of farm threatens the community constituted by agriculture, with its commonality of interests and views, and institutions developed to support them. There is no known or obvious threshold such that after it has been breached, agriculture as community will be begin to dissolve; however, as the people and economic resources and commonality of views decrease, the ability to maintain community and its institutions must surely go into decline.

As this occurs, it stands to change the engagement of agriculture and farming with the broader community- rural residents and municipal governments, provincial and federal governments, agribusiness, and broader agricultural markets. These changes could be highly disruptive, and in turn could undermine elements of policy that are supportive and protective of the farm community.

Recognition of these risks can lead to proactive steps. Perhaps the most fundamental is the creation of awareness that the current trends in farm structure should be expected to lead to disruptive changes, and if these are to be reduced or avoided, our institutions of working together in agriculture need to be serviced and maintained, and redeployed. A focus on supporting the mid-sized farms- through facilitating collaboration between producers to offset size disadvantages, or to support farm products marketing efforts that are more amenable to mid-sized farms- would seem consistent with this.

In devising mechanisms to stabilize the middle size of the distribution of farms, it will be absolutely critical to not discriminate against the large. Large farms have not expanded as the middle size has declined out of some nefarious intent; it is the outcome of free-enterprise and competition and the leveraging of economies of size that creates our highly efficient agricultural system. The large farms are best positioned to adopt the latest technology, account for the preponderance of FCR, and anchor food supply chains- discriminating against them would be highly counterproductive.

Anticipating the difficulties and addressing options for government policy and new roles for grassroots agricultural organizations will be nuanced and require extensive dialogue. This needs to occur.

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