

**Four Fallacies of Agricultural Sustainability,
and Why They Matter:
Part 2- Smaller is Better**



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Introduction

The view that additional steps should be taken to confirm that food is produced sustainably has become ubiquitous in Canada, as well as in other developed countries. Consistent with this, the downstream food industry has become much more interested in the upstream elements of its supply chain, especially the farm segments and the technologies/processes it employs, and has sought to derive metrics that measure and influence the sustainability of this food end product. This plays out across a range of parameters, including carbon footprint, water use, pesticides, fertilizers, antibiotics, hormones and growth promotants, animal welfare, labour standards, as well as others. In some cases, specific technologies or techniques related to the above have been targeted, such as genetically modified, specific pesticides, specific animal health products, certain livestock housing systems, etc.

This represents a plausible response to increased public awareness of natural resource scarcity and of food security. However, important aspects of this movement are simplistic, misguided, or simply wrongheaded, and following these through to their logical extent presents the prospect of pitfalls for the agri-food system. Perhaps more fundamentally, it begs the question as to how the agri-food system, and primary agriculture in particular, grew to become so unsustainable to begin with. In Canada many generations of farmers have seen themselves as stewards of the land, farm product production has greatly increased and intensified, and rather than starve or cause mass illness, we have produced significant surpluses for export at steady or improving quality standards.

Others, including some farmers, are deeply concerned about the future of the agri-food system, how natural resources, human resources, and technologies are used and what the potential consequences may be. There are examples that can be cited that lend support to these types of concerns.

This highlights a gap that has emerged in our understanding of how agri-food production systems develop and evolve, and how this relates to sustainability. The purpose of this paper is to help develop the case for a more holistic and coherent view of agri-food sustainability as a process. As a means of advancing, four fallacies related to agri-food sustainability are identified and discussed in the sections below. These are:

1. We should tread more lightly on the agricultural land base
2. Small farms are better
3. Farm technologies can be picked from a menu
4. New technology will solve all problems

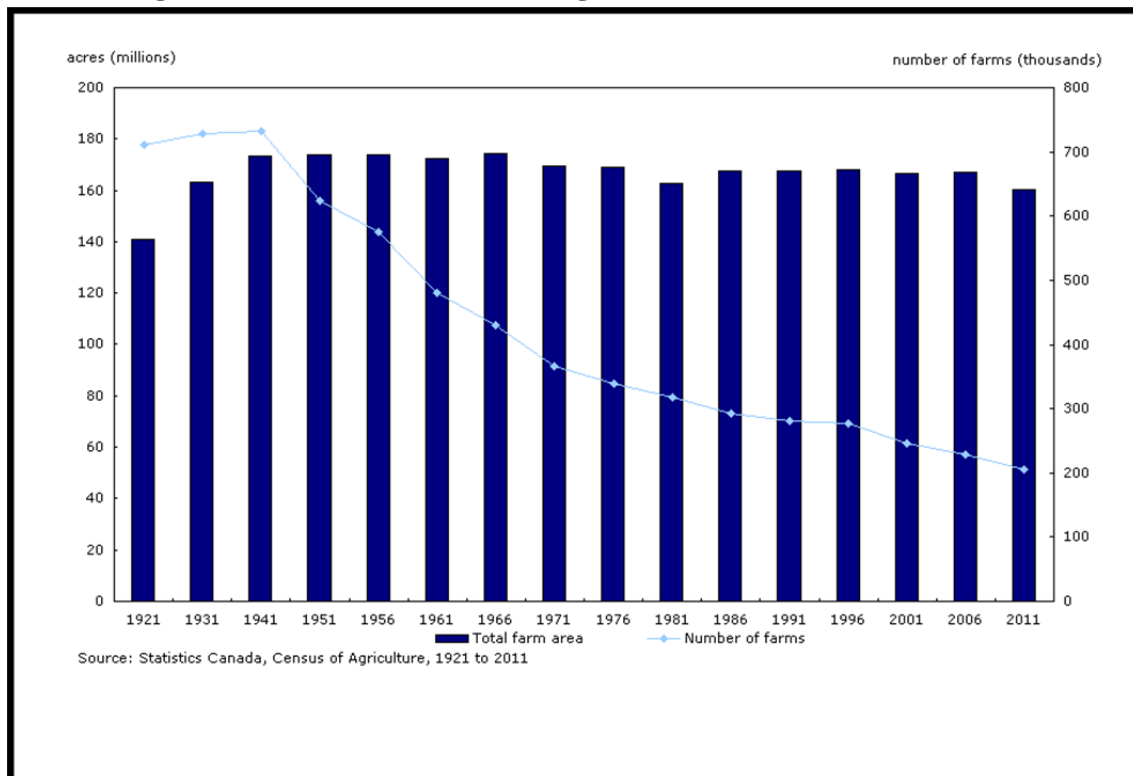
This paper is the second in the series of four, which considers the second of these issues.

Smaller farms are better

The merits of the small farm have become a significant, if not sometimes implicit, element of food marketing. It evokes an appealing view of rural communities and agrarian enterprise. However its logical implication is of significant or growing employment in agriculture to generate a given level of farm/food output- or at least more employment than would occur under a structure of fewer, larger farms. This is at variance with agricultural and economic development in Canada, and risks significant social costs if reorganization toward more, smaller farms were broadly encouraged, especially if this were to become an element of policy.

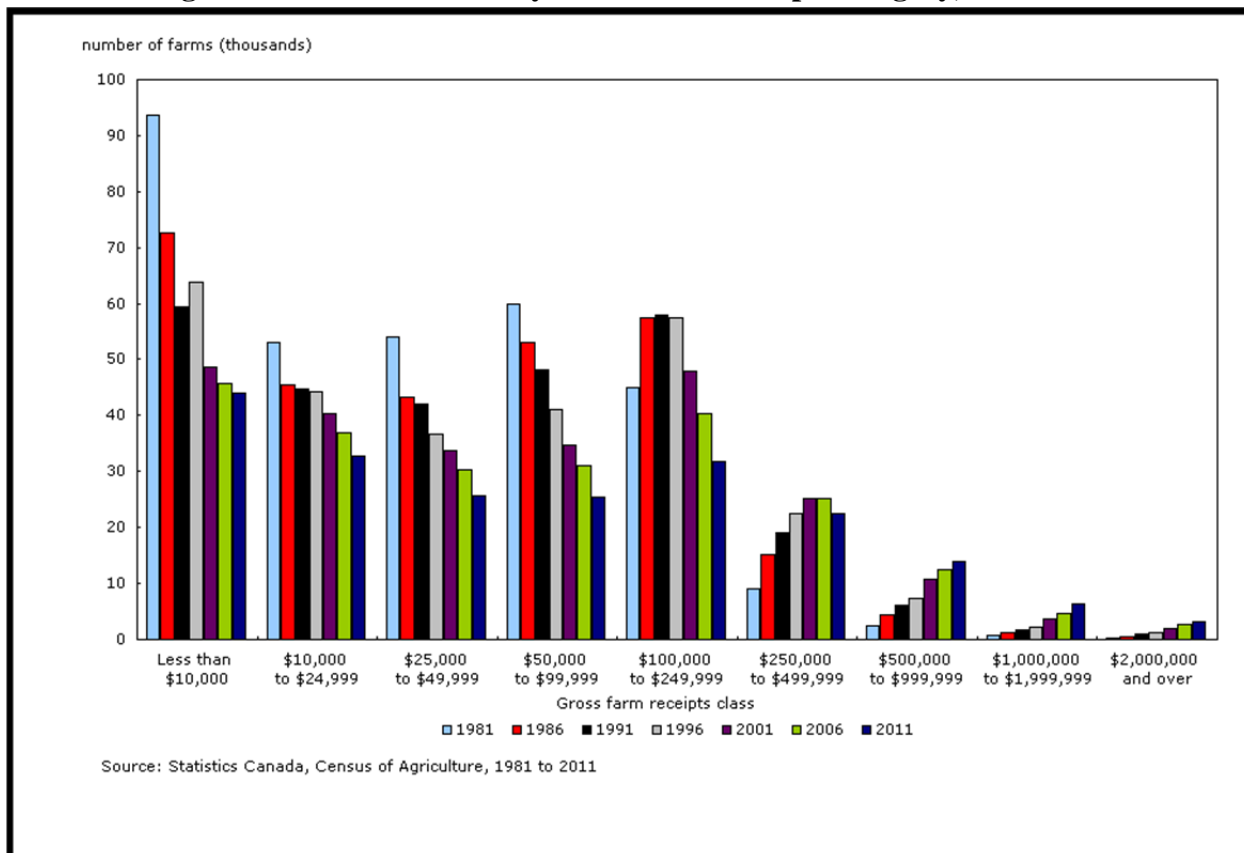
Canadian agriculture has long contained a diversity of farm sizes, conditioned on a range of factors. These include yield and revenue potential, financial risks associated with controlling assets and managing large farms, ability to attract family members and employees to farm work, technology with which to manage farms at alternative scales, the presence of off-farm work, and individual preference. Farms in Canada have been growing increasingly larger and fewer in number since the 1940's. This is illustrated based on the agricultural census in Figure 1 below. The number of farms in Canada peaked in 1941 and has been in decline ever since, while the agricultural land base has been steady at around 160 million acres. The obvious implication is that on average, farms have been growing in physical size in terms of land base operated.

Figure 1 Number of Farms and Agricultural Land Base in Canada



However, it remains that there is diversity in terms of farm sizes in Canada. This is illustrated in Figure 2 below in terms of economic size. The greatest frequency of farms is in the smaller farm cash receipts categories. In general the number of small farms has declined over time; indeed, the only farm size categories that are increasing in frequency are those with farm cash receipts in excess of \$500,000.

Figure 2 Canadian Farms by Farm Cash Receipt Category, 1981-2011

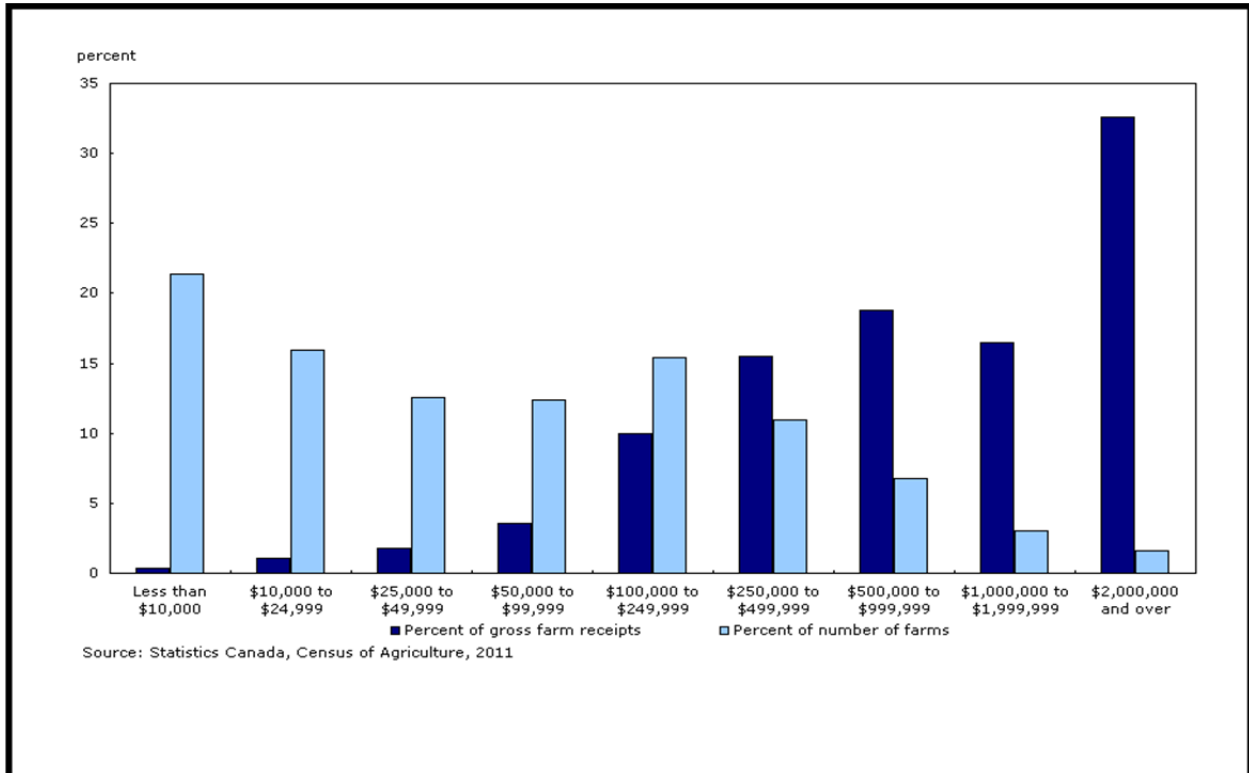


The economic contribution of farms is out of proportion to their frequency, with larger farms collectively making a much larger economic contribution than smaller farms. This is illustrated in Figure 3. For example, farms with sales in excess of \$2 million account for over 30% of farm cash receipts, even though they represent less than 5% of farms. Meanwhile, farms with less than \$100,000 in receipts, which collectively represent more than half of farms, generate less than 10% of farm cash receipts.

In interpreting this information, it is important to consider the income and lifestyle situation faced by individuals operating farms at alternative economic scales. Farms operating at a scale of \$25,000 in farm cash receipts, for example, cannot be of sufficient economic scale to provide an economic living to the operator. This is because there are expenses incurred in generating the sales, and the basic annual cost of living in most areas will surely exceed \$25,000. When the combination of threshold earnings required to provide a full time living and the costs of

production are factored in, it becomes evident that only a subset of farms could possibly be professional occupations. The smaller categories must thus represent a farming sideline or hobby activities on behalf of people with other primary, full-time sources of income. The larger categories present the income prospect of a professional occupation in farming. And the data show that small farms collectively have little economic significance, and would provide very low incomes absent other forms of employment.

Figure 3 Farm Sales Categories as Share of Farms and Farm Cash Receipts



At the same time there is a popular sense that large farms (however defined) are in some sense inferior or less desirable than small farms. Small farms have come to be viewed as a core element of an agrarian cultural ideal. The idea has even spread to urban areas where community gardens and rooftop farming are seen as part of a grassroots movement to increase and improve access to an affordable and environmentally sound food supply.

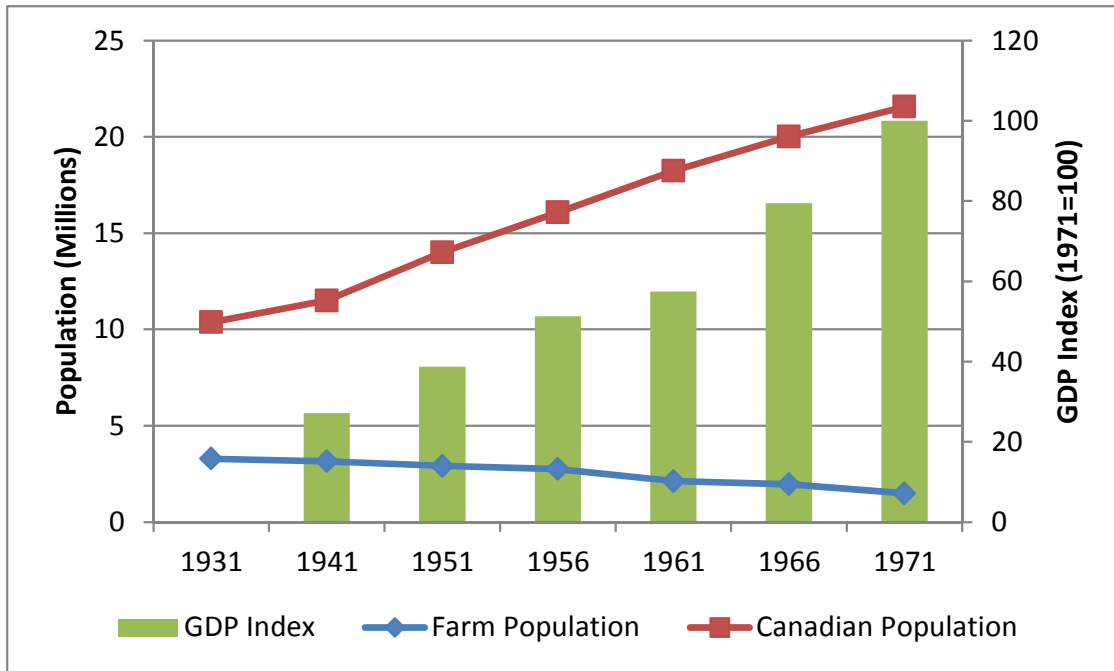
The observed diversity of farm sizes in Canada is consistent with a free enterprise system in which individuals freely structure their farm businesses according to scale of operation, assets, and technologies employed based on their personal and business goals and constraints. However, the idea that small is somehow better is at odds with the trends observed above, as well as with the long-run development of Canadian agriculture, and ignores the significance in terms of social and economic development of the growth of a professional farmer segment. Farms have increased in size for a reason, and should be allowed to continue to do so.

Some see small scale farming linked to food security; perhaps the staunchest proponent of this view is the UN Rapporteur on Food, Olivier De Schutter, as evident in his March 2014 report. The Rapporteur has argued that “agricultural development can combine increased production, a concern for sustainability, the adoption of robust measures to tackle unsustainable consumption patterns, and strong poverty-reducing impacts. Governments could achieve this by providing strong support to small-scale food producers”. This distinct focus on maintenance of many small farms as poverty alleviation or economic development is literally the opposite of the Canadian experience.

Historically, settlement in Canada and agricultural development created primary economic activity in rural areas that had previously not existed. As productivity enhancements occurred through innovation, invention, and the products of agricultural research, it allowed for increased scale and specialization of farms, and increased the social division of labour as relatively fewer individuals were required to produce farm and food products to feed the nation. As such, many left the farm in favour of urban-based occupations and the remaining farmer grew, both in terms of physical and economic farm size.

Figure 4 below provides an historical reference from the Statistics Canada archives. The figure shows that the farm population in Canada was about 3.3 million in 1931, or about 32% of the total population. By 1971 the Canadian farm population had decreased by almost 2 million and fallen to less than 7% of the total Canadian population. This was accompanied by a steady increase in Canada’s real GDP- which increased by about four-fold between 1941 and 1971. Obviously other factors influenced this increase in real GDP, but an important component was the fact that increased agricultural productivity freed up a workforce for other industries in the economy that had previously been consumed working on farms.

Figure 4 Canadian Population, Farm Population, and GDP Index



Source: Statistics Canada Archived Data

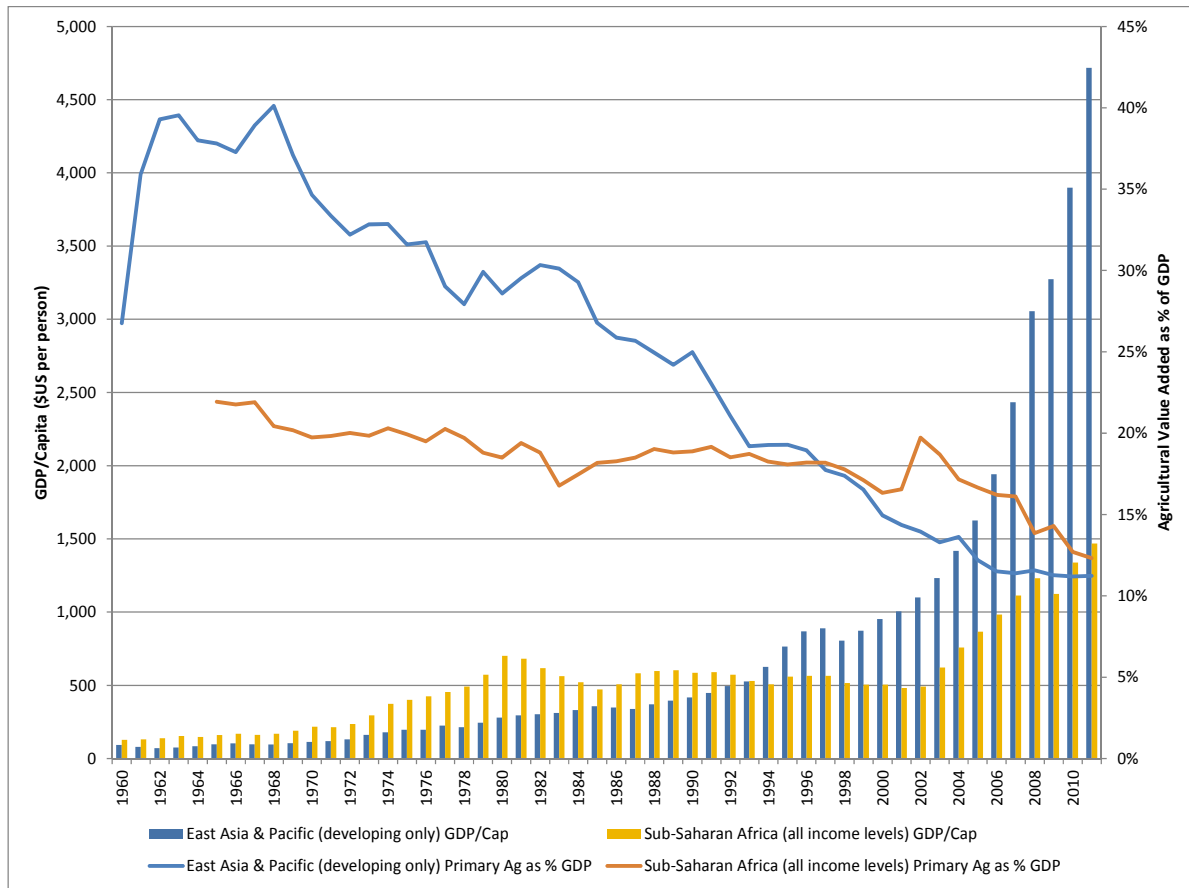
Perhaps the best evidence of this is that Canadian cities were not the site of urban ghettos of displaced farm people; rather, the labour force released from farm work as farms mechanized and expanded in size migrated to cities to work in urban jobs. Thus, increases in output per worker and increased farm size have been fundamental in facilitating the division and specialization of labour in the economy, which in turn supported overall GDP growth. Hayami and Ruttan (1985) note that “Western economies are characterized by rapid technical progress in agriculture, relatively modest rates of population growth, and a declining response in the demand for farm products to income growth. Rapid urban-industrial development has been perceived as essential if rural labor, made redundant by the rapid gains in labor productivity in agriculture, is to escape from low-productivity employment in the rural sector and make an important contribution to national economic growth”.

This is in contrast to the claim made by a character in John Steinbeck’s novel *The Grapes of Wrath*, “the tractor does two things--it turns the land and turns us off the land. There is little difference between this tractor and a tank. The people are driven, intimidated, hurt by both. I lost my land, a single tractor took my land”. Without minimizing the real pain of dislocation, agricultural innovations like the tractor allowed farms to get larger and freed many people from the drudgery of farm work to improve their standards of living in occupations outside of farming. To large degree, this built the urban middle class in Canada.

That agricultural development and intensification leads to an increased division of labour and increased aggregate economic growth is hardly a profound realization. The concept has been expounded very well by Diamond (1997) in explaining the historical dominance of agrarian-based societies over hunter-gatherer societies through specialization and social division of labour. Economies in which everyone devotes a significant portion of time to producing or acquiring food are dominated by those in which a subset of the population specializes in producing food for all, allowing others to specialize in other occupations.

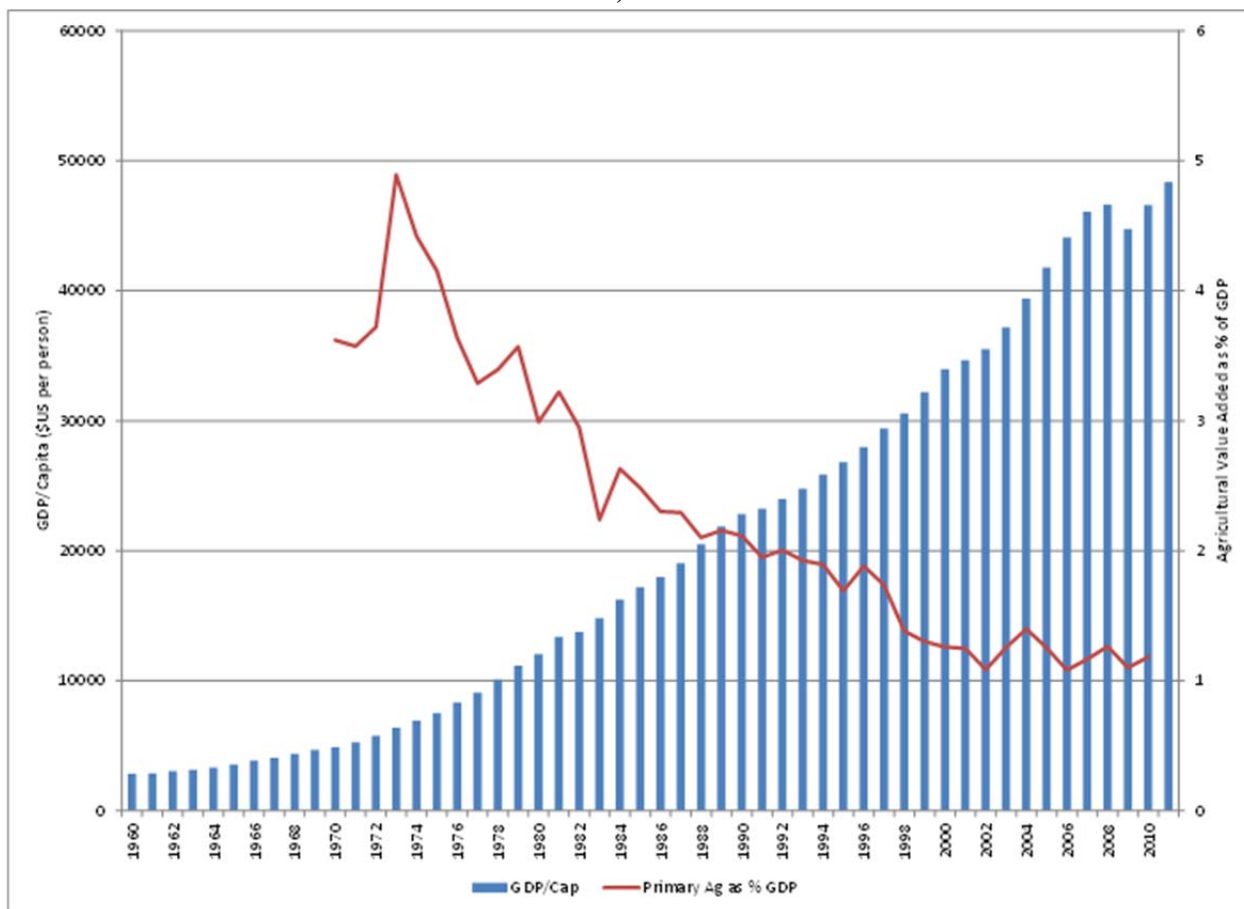
It is also evident in international statistics that contrast developed and less developed countries. Countries that occupy a large proportion of their resources and workforce in feeding themselves tend to underperform relative to those in which agriculture is specialized allowing resources and people to be used in other aspects of the economy. For example, Figures 5 (Developing countries in Southeast Asia and Sub-Saharan Africa) and 6 (North America) below present data on per capita GDP and the share of primary agricultural value added in GDP. These demonstrate that increased GDP is consistent with a reduced share of agriculture in GDP. It also shows that

Figure 5 GDP per Capita (current \$US) and Agriculture Value-Added as Percentage of National GDP, Developing Countries in Southeast Asia/Pacific, and Sub-Saharan Africa



Source: World Bank

Figure 6 GDP per Capita (current \$US) and Agriculture Value-Added as Percentage of National GDP, North America



Source: World Bank

in developed regions like North America, the share of primary agriculture in GDP is much lower than in less developed regions. The data on employment shares in agriculture do not exist to the same extent; however, the World Bank reports that the share of employment in agriculture in the Southeast Asian region fell from 46% to about 36% between 2004 and 2011. In contrast, employment in US agriculture was steady at 1.4-1.6% between 2004 and 2010. As with the data in Figure 4 there are other important economic and social factors involved in creating the observed growth in GDP; however the transformation of people out of basic agriculture to contribute to an industrializing, urbanizing economy are a significant element.

Imagine now what would happen if we were to turn back the clock on this process by actively encouraging the reorganization of farming toward smaller units and greater employment. To intentionally have more, smaller farms that would supply the same output as our current structure does, recalling that a small number of large farms generate more than half the output, would require a significant net increase in the workforce consumed in primary agriculture. The workforce would need to be reallocated to a large extent away from urban jobs in services and

manufacturing to farming. These industries would suffer from the lack of workers. How many fewer computer programmers, carpenters, machine operators, oncologists, personal trainers, and retail employees might we have if we intentionally organized ourselves into small farms? Moreover, increasingly Canada's highly educated workforce prefers to be working in other types of jobs that utilize their skills and training; one of the challenges to agriculture is to compete for an increasingly highly skilled workforce.

Of course, nobody is suggesting any of this in expounding the merits of the small farm. People operate small farms for any number of personal and business reasons which should be appreciated. Small farms can lend diversity, uniqueness, and certain types of innovations that can be more difficult to achieve with larger operations. We also periodically discover certain limits on the feasible scale of farm operations, as determined by technology, human, and natural factors. For example, Holbrook (1955) describes the rise, decline, and breakup of the large "Bonanza" wheat farms of the Upper Midwest US in the late nineteenth century, as smaller homestead farms proved more competitive for land than the large farms. Allen and Lueck (2000) describe some of the organizational factors leading to larger farm units and also those limiting farm size, and explains why the vast majority of farms remain organized as family businesses. They explain that the difficulties in accounting for effort and production uncertainties in compensating hired employees limit the size of farms (some more than others), *"The benefit of the family farm organization is that the farmer does not cheat himself"*.

However, small farm advocates show little hesitation or restraint in making sweeping criticisms of larger farm operations, or what they sometimes call "factory" farms. Perhaps the most egregious element of this is the imagery in marketing in which the small farm is positioned as natural, traditional, more friendly or wholesome with the not-so-subtle message that smaller is better. This also invokes a notion of social sustainability- a view of a past in which many small farms existed that supported one another in rural communities over generations. Food marketers are buying into this messaging heavily, and the risk exists that it will influence elements of public policy. But this is revisionist history; farms in Canada have been upgrading technology, specializing, and getting larger for many decades as the statistics illustrate, people have been leaving farms, and the Canadian economy has benefitted as a result.

Rural communities have evolved with this trend. Indeed, without this occurring, it is unclear that many rural communities and their social structures could be sustained today. How many small town businesses, rural schools, churches, service clubs, arenas and ball diamonds, and the associated tax base, should we expect that the small farms could realistically support given what the data tells us about their low incomes from farming and the aggregate value of what they produce? The farm income data cited above should provide a sobering indicator that farms intentionally kept small may not result in a sustainable living. As an illustration, a recent New

York Times op-ed by Bren Smith notes that “The dirty secret of the food movement is that the much-celebrated small-scale farmer isn’t making a living”¹.

It is folly to suggest that we somehow step out of or attempt to manipulate of the process in which farms adopt improved technology, use less sweat labour, and generally become larger and more competitive. Rather, we should be appreciative and tolerant of the diversity of Canadian farms and farm sizes, and thank the advancing development of a professional farmer segment, improved competitiveness, and the technologies and the size of farms that support this for the division of labour we enjoy in our economy, and the growth in standard of living we enjoy as a result. This is contrary to the small farm mantra that has gained such popularity in recent years.

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¹ http://www.nytimes.com/2014/08/10/opinion/sunday/dont-let-your-children-grow-up-to-be-farmers.html?_r=0

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