WYE CITY GROUP ON STATISTICS ON RURAL DEVELOPMENT AND AGRICULTURE HOUSEHOLD INCOME
Second Meeting
Italy, Rome, 11-12 June 2009
FAO Head-Quarters

The Family Farm in a Flat World: Implications for Farm Household Data Collection

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Keywords: Farm household, farm structure, farm size, hectares, pluriactivity, off-farm income

1. Introduction

The 2007 Handbook on Rural Households' Livelihood and Well-Being (United Nations, 2007, and hereafter referred to as the Handbook) emphasizes (1) that there are many meaningful systems for classifying rural areas and agriculture is but one of many important themes in rural indicator development and (2) that an important unit of analysis for agricultural indicators is the farm household. The first 7 chapters of the Handbook are devoted to rural indicators and the next 8 chapters are focused on indicators for agricultural households. The objective of the continuation of the Wye City group includes the consideration of challenges to consistency of adoption of comparable methods of data collection across countries. In particular, the focus of this meeting is to examine the emerging issues related to the adoption of comparable methods across countries.

In the spirit of recommending improvements to the handbook, in this paper we hope to make a contribution by (1) recommending that an important enhancement to the Handbook would include the development of an integration of its two separate parts on rural indicators and agricultural household indicators, (2) emphasizing the importance of farm structure in the context of a cross-country comparison of farm household well-being indicators, and (3) discussing emerging issues for future information priorities.

2. Framework Integration for Rural Territory and Farm Household

The Handbook could have easily been presented as two separate handbooks, one on rural indicators and one on farm household well-being indicators. This is because the Handbook lacks a full conceptual treatment of the integration of these two realms. Chapter III offers the reader a conceptual framework for the rural indicators and Chapter IX provides a conceptual framework for the agricultural household indicators. Most of the material in the current conceptual framework chapters explores current institutional approaches to the indicator issues and presentation of empirical analysis of alternative indicators for the two foci, rural territories and agricultural households.

A future improvement in the Handbook would be to provide an underlying conceptual framework to the process of territorial development that includes the performance of industries and the well-being of people, such as agricultural households. Firms and households are the basic units economists use to model and understand behaviors. It is these behaviors that government policies attempt to influence and, collectively, eventually result in development outcomes, such as population migration, income distribution, business investment and location choices, productivity, and quality of life variables including environmental quality. In a flat world of outsourcing, insourcing, open sourcing, supply chains, etc., internal and external forces are quick to ripple through agriculture, rural areas, and other parts of the economy. Furthermore, a more comprehensive framework should be viewed separately from, and as the basis for, the development of a conceptual framework for development of indicators. Currently in the Handbook, the foci of the conceptual frameworks provided are limited to indicator frameworks.

The provision of a general regional development framework is essential given the diversity across countries and within territories in terms of standard of living, inequality, natural resource endowments, share of the population engaged in agriculture, and population densities, to name but a few variables. For example, using a unified definition of rural, the Handbook reports a wide range of national shares of population who are considered to be rural, from under 10 percent in the Netherlands and Belgium to about 60 percent in Finland, Norway and Turkey, as well as considerable variation in areas of territories classified as rural (from about 35 to nearly 100 percent). The proposed, more cohesive, framework we envision will encourage innovations in knowledge generation about indicator development and policy design.

Given the multitude of interrelationships that are relevant, it is no simple feat--and we make no attempt to provide in this paper--a description of an integrated framework. The two conceptual frameworks and the Introduction currently in the Handbook provide clues as to the most productive interrelationships that must be incorporated into an integrated framework. Regional development frameworks, in general, should provide a useful starting point for the proposed

conceptual framework material that could be provided in future enhancements of the Handbook. One empirical outcome from this framework, for example, would be development of the aggregate relationships captured by the System of National Accounts from the bottom-up and lead to disaggregated accounts for relevant policy units, such as subpopulations of households and firms and for relevant territorial units.

3. Farm Household Indicators Begin with Structure

The most basic indicators to describe the structure of any industry are the number and size distribution of units, or in our case, farms. Describing the structure in basic, nonmonetary terms, is helpful in developing an understanding of how to develop a meaningful stratification within the industry for monetary indicators. This is useful to understand the dynamics in the industry over time and to understand to what extent income problems are linked to management and strategy of firms or to the structure of the industry.

Agriculture as an industry is unique, as has been commonly understood, including in the Handbook and elsewhere. In particular, agriculture continues to be dominated by many, oftentimes small, family farms. Allen and Lueck (1998) argue that the factors that contribute to this situation result from the dependence of the farm production function on nature, which is seasonal and random. There is also evidence that farmers are willing to trade-off cash returns for nonpecuniary benefits by continuing to operate small family farms (e.g., Fall and Magnuc, 2004, Key, 2005). Often times ignored in the empirical literature, perhaps because it is widely acknowledged, is that family farms usually provide the family a place of residence, with intergenerational links, and a variety of nonmarket social and natural amenities.

The highly skewed size distribution of farms worldwide limits the usefulness of indicators of the average well-being of farms and farm households. In order to be useful, cross-country comparisons of well-being indicators should be complemented by consistent indicators of farm structure. An indicator framework should also recognize the value of flexible and broad definitions of farms and family farms. We provide four recommendations regarding the development of indicators for agriculture:

- First, in order to enhance their usefulness, cross-country comparisons of well-being indicators should be complemented by basic and general indicators of farm structure that are relevant to all levels of country development.
- Secondly, allow for comparability and inclusiveness in defining the farm population across countries. The countries which have farm definitions that incorporate a requirement that farms be commercial in nature will limit the cross-country comparability of indicators. If the scope of the farm population is limited to commercial production, the indicators will very quickly become irrelevant for many of the most important policy issues. While many farms are small in terms of their production of agricultural commodities, they may be producing other goods and services that will garner public support in the form of subsidies or gain in value in the marketplace, such as landscape amenities, carbon sequestration potential, or locally-produced food. Furthermore, to the extent that an integrated rural and farm data system is desirable, the small farm households will be within the scope of the population of interest. This approach of being inclusive of all farms is similar to the recommendation provided in the rural indicator part of the Handbook which argued that the most useful classification system of territories is one which classifies all

territories in a nation. On the other hand, we believe this is controversial and should be the subject of debate for a very pragmatic reason: the data collection costs of identifying and collecting information from very small farms. If the primary goal is information on agricultural production, the data collection costs may not warrant the outlay in terms of agricultural coverage. Furthermore, if indicators only reflect the means of the population, the inclusion of the small farms distorts the position of the group of farms fully engaged in agricultural production. Statistical approaches to containing the data collection costs associated with inclusion of small farms include adjusting sample weights for undercounted small farms or by modeling the small farm sector.

- Thirdly, do not limit the population of farms which are the focus of indicator development to family farms (however defined). Just as the appropriate definitions of rural territories may vary depending on the context and the issue at hand, the definition of a family farm will always be variable, making comparisons problematic. Limiting indicators to family farms, the group for which household indicators are meaningful, may prevent indicators from capturing important structural change in agriculture.
- Fourthly, in defining the population of farms and family farms and developing well-being indicators, the accounting must allow for complexity in the dynamic nature of key business relationships and agricultural technologies. In a flat world, successful businesses and households are constantly adjusting to take advantage of the potential productivity gains that are offered by new ways of doing business and producing agricultural goods and services. For example, in the US, 11 percent of farms report that individuals not related to the farm operator share in the asset ownership of the farm (excluding landlords and lenders); 35 percent of farms report renting in some of the land they operate; 42 percent of farms have two operators (usually the spouse of the principal operator) and 7 percent of farms have at least three operators; 10 percent of farms have marketing or production contracts (USDA, NASS, 2009; table 4). Each of these structural characteristics—shared ownership and management—are much more common for large farms and, hence, much more of the total US commodities are produced under these shared arrangements than are reflected by the incidence of the practice. A comprehensive set of indicators, structural in nature, should include measures that capture these types of business and family relationships. A source of complexity in business relationships that will vary significantly by country arises from evolving and variable farm inheritance and estate tax traditions and policies.

3.1. US Examples of Effects of Structural Change on Agricultural Indicators

While indicators will always lag changes, developers of data collection systems are constantly evaluating whether the current system is capable of accurately collecting and accounting for the costs, returns, and various forms of capital involved. It is best to have flexible frameworks that allow for changes in business or production system to be accounted for, although this is not always foreseen. In that case, it is best to make enhancements to the empirical frameworks to match structural changes, as earlier as possible. Perhaps one indicator of how well indicator developers are accomplishing their goal is whether or not an indicator system was able to account for an innovation, or once recognized and accounted for, how significant was the revision in the indicator. We provide three examples from the US experience; they vary based on the magnitude of the revised indicator and the understanding about the interpretation of the indicator. First, the concepts that multiple households share in the returns and ownership

portfolio associated with a single farm business unit and that some of the farm labor expenses are paid to farm household members have been incorporated into US farm household indicators for more than two decades. This enhancement resulted in a significant change in our understanding about the well-being of US farm operator households (Ahearn 1986; Ahearn, Perry, and El-Osta 1993). The change was significant because the US went from a system based on constructing estimates using aggregate accounts with many gross assumptions to a system using farm household level data.

Another example for the US was the evolution of the understanding of production and marketing contracts in agriculture. While commodity experts were aware of the incidence of contracting for some commodities, e.g., poultry, and the Census of Agriculture collected qualitative information on its incidence as early as 1960, an understanding of the terms of contracts for income accounting purposes was only documented in the late 1980s (Farm Income Estimation Team, 1988). Unlike the previous example, which led to significantly revised estimates of farm household income indicators, the understanding on contracting provided a fresh perspective on the meaning of the aggregate indicators, namely, it identified that the residual claimants of the aggregate net farm income included contractors as well as farms. Improved quantitative data were not collected with the intention of improving the accounting and understanding the distribution of costs and returns of contracting until this period and later (e.g., Farm Business Economics Branch, 1996 and MacDonald, et al., 2004). Because contractual arrangements varied significantly by commodity and region of the country, there has been a rather long learning period to develop a satisfactory data collection process.

More recently, the US began collecting information on the corporate dividends that incorporated family farms pay to members of operator households to improve the development of income indicators for this small group of farm households and updated its definition of a family farm. Unlike the first two examples, this enhancement did not significantly alter the magnitude or understanding of the indicators, but it allowed the framework to be better equipped for accounting for structural changes as they occur. The ability to capture the effects of structural changes on indicators with a minimal lag is largely due to the development and availability of the Farm Costs and Returns Survey (now called the Agriculture Resource Management Survey, ARMS) farm level data base (Johnson and Baum, 1986).

To support our view about the importance of structure in comprehending indicators of well-being for farming, we next provide a cross-country comparison of (1) the size distribution of farms, (2) the change in the size distribution of farms between 1997 and 2007, and (3) the extent of pluriactivity for the U.S. and Europe.

3.2 Number and size of farms/holdings in 2007, US and EU

We provide farm (holdings) distributions by two underlying size measures: an input measure, hectare classes, and an output measure, Standard Gross Margin classes. Furthermore, to emphasize the diversity within, we present measures of these indicators for two EU countries: The Netherlands and Italy. The size distribution varies considerably by geographic region of the U.S., just as it does among the member countries of the EU.

Both the European and the US definitions of farms are not without controversy. For an EU perspective, Poppe et al (2006) discuss the issues with the farm definition and, for the U.S., the definitional issues are discussed in O'Donoghue, et al. (2009).

For the EU, a holding is a technical-economic unit under single management engaged in agricultural production. According to Eurostat (2000), p. 10:

> "The field of observation of the Community farm structure surveys extends to the following survey units: Agricultural holdings with a utilised agricultural area of 1 ha or more; agricultural holdings with an utilised agricultural area of less than 1 ha if they produce on a certain scale for sale or if their production unit exceeds certain natural thresholds. Member countries may introduce thresholds if certain conditions are not met."[1]

In the US, a farm is defined (by the National Agricultural Statistics Service) as any place from which $US 1,000 or more of agricultural product was produced and sold, or normally would have been sold, during the year (USDA, NASS, 2009). Hence, it is a very inclusive definition and includes farms operated by households that are retired or attracted to farming for reasons not primarily related to production, such as the rural lifestyle or investment opportunities. In addition, since the definition is dollar-based, it becomes more liberal with each passing year as price levels change. Although it is regularly discussed, an inclusive definition of a farm is very popular with many for a variety of reasons (O'Donoghue). For example, some Federal program dollars are distributed to states in part based on the farm population in a state, e.g., extension funds.

Tables 1a. and 1b. compare the size distribution for the territories using land area classes (hectares) and tables 2a. and 2b. compare the size distributions using an output based measure of size, the Economic Size Unit (ESU).[2] In recognition of any biases that could be interjected by the lack of comparability in farm definitions across the countries, we report the distributions in two ways. First, we consider all farms/holdings in calculating the share of farms in each class. We also report the share of hectares in each of the size classes. For the EU, the data are from the Farm Structure Survey (FSS, Eurostat, various years) . For the US, the population would be farms as represented in USDA's ARMS data. Both data sets exclude farms of less than 1 hectare (ha) with negative standard gross margins (SGM). Since the cross-country definitional inconsistencies affect the populations at the small end of the distribution, we also report the

[1] Different thresholds are, in fact, used by some member countries. The countries that likely have higher thresholds than 1 ha include: Belgium, Denmark, the Netherlands, Sweden, and the UK. These thresholds are defined by either larger hectare sizes, standard gross margins, or major occupation of the farmer. While the UK defines both main and minor holdings, the Eurostat statistics only include the larger "main" holdings for this country. Belgium's definition is perhaps the most conservative, and includes only those whose major occupation is farming or who produce on a "commercial" basis. Denmark uses 5 ha, the Netherlands uses 4,200 ECU (in 1997), and Sweden uses 2 ha, as alternative thresholds. The Netherlands notes that the definition covers 99% of total agricultural production.

[2] The disadvantage of using the land area size measure is the great variability in the productivity of the land. In the U.S., for example, there are approximately 1 billion acres classified as agricultural land, excluding forests, but less than half of that is cropland. The majority of US agricultural land is used for pasture and range. On the other hand, measurement issues are facilitated when size classes are defined by land area.

distributional statistics after eliminating the small tail of the distribution. In this second way, for farm size measured in hectares, we eliminate farms of less than 5 hectares. For farm size measured in ESUs, we eliminate farms of less than 4 ESUs.

In 2007, there were 2 ½ times more farms/holdings in the EU than in the US (approximately, 5.6 compared to 2.2 million), but the US has nearly three times the land area in farms. US farms are significantly more likely to be 100 ha or more, than are EU holdings (26% compared to 5% in 2007). Conversely, US farms are also less likely to be less than 5 ha than are EU holdings (12% compared to 54% in 2007). About 90 percent of EU farms are less than 50 ha, compared to about 58 percent of US farms. Of course, the distribution of the land area by farm size is even more skewed than the distribution of the number of farms/holdings. The farms/holdings of 100 ha or more control 12 percent of the land in the EU and 87 percent of the land in the US. It seems accurate to say that, in general, US farms are larger than EU holdings when size is measured in land area. We reach the same conclusions when we eliminate the holdings of less than 5 ha from the distributions, although the differences between farm sizes in the US and the EU are not as large.

The size distribution of farms for Italy and the Netherlands shows the diversity within the EU. Italy has a smaller farm structure than the EU at large, while the Netherlands has a larger farm structure. For example, in Italy for 2007, 85 percent of the farms, comprising 34 percent of the land, are in farms of less than 20 ha. In the Netherlands, in contrast, only 42 percent of the farms, comprising 5 percent of the land, are in farms of less than 20 ha.--and these include a significant number of glasshouse holdings that are big in sales but not in land use.

The conclusion about comparative size distributions is less extreme when the economic measure of size, the ESU, is employed. The ESU measure of size allows us to capture the differences in the intensity of production on the land area. One reason for differences in the intensity of agriculture might be the result of differences in climate and the quality of the natural resource base. For example, large areas of the US, especially in the West, have low land quality. It is in these areas of the US that we see a large share of the largest farms in terms of land area.

Based on ESUs, it is still true that a greater percent of farms are classified as large in the US than in the EU, but the differences are not as great as in the case of size measured by land area. There were 10% of US farms of 100 ESUs or more, compared to 5% of the EU holdings in 2007. Roughly one-quarter of the farms/holdings in the two territories are greater than 16 ESUs (27% in the EU and 26% in the US). However, using the ESU size measure, the US has a greater share of small farms of less than 2 ESUs than does the EU, 55% compared to 28%. In fact, comparing the US to member countries, the US' share of small farms is even larger than Italy's share of small holdings <2 ESU of 34 percent.

When we eliminate the smallest farms (of under 4 ESUs), in the interest of consistency in definition, we reach the same qualitative conclusions regarding the larger farm structure of US farms. However, the Netherlands has a larger proportion of its holdings in the largest size class of 100 ESUs or more than the US, indicating the diversity within the EU.

3.3 Changes in the Size Distribution

By comparing the 1997 size distributions for the two size measures, hectare classes and ESU, in tables 1a. and 2a. to those for 2007 in tables 1b. and 2b., we get a sense of the different dynamics in the territories. For the EU territories as a group, the number of holdings in the decade between 1997 and 2007 in the small hectare size classes (<20 ha) declined, while the share of farms in the larger size classes increased. This shift represents an increase in the concentration of production in the EU. This is consistent with the results reported by Poppe, et al. (2006). Obstensibly, during this same period, the US experienced another dynamic. The share of small farms increased, and the share of the largest farms (50 ha. and over) declined. However, the decline in the share of large farms is also reflecting an increased concentration in production: although the number and share of large farms decreased, as a group these large farms still operated the same share of farmland and still produced the same share of production in 2007 as they did a decade before. Had the size cut off for large farms been greater, for the US, there would have been both an increase in the number of farms and the share of farms that are large. The US result of a decline in the share of large farms (>100 ha), in contrast to the EU's increase in the share of large farms illustrates that this fact alone cannot be used as evidence of the concentration in production, since both territories experienced an increase in concentration. For the US, there has also been a relatively rapid increase in the number of small farms; this increase has a significant effect on the share of farms in any particular size class. A popular measure in industrial organization is to report market shares for the 4 largest firms in an industry, i.e., CR4 ratios. This low number of farms, four, may present some confidentiality concerns for agriculture, although Bunte has done so for the NL (OECD, 2006). A common way that concentration is reported in the US for agriculture, is to report the number and share of farms that account for a certain share of the sales or production (75, 50, 25, and 10 percent). For example, in 2007, 1.5 percent or 32,886 farms accounted for half of all products sold, compared to 2.4 percent or 46,068 in 1997, and 3.6 percent or 75,682 in 1987 (USDA, NASS, 2007 and earlier censuses).

When size is measured by the ESU class, the same dynamics are observed as when size is measured by hectare class, but there are less dramatic shifts over time. For example, the share of holdings in the EU declined in the smallest class and increased in the largest class. For the US, the most notable dynamic was the larger share of small farms in 2007 compared to 1997 and, while the share of farms in the largest size class change little during the decade, the share of land operated by these farms increased from 36 percent of all hectares operated to 45 percent.

The comparison above regarding shifts in the size distributions between two time periods for aggregated size groups does not provide information about the underlying dynamics of farm entries and exits as well as the growth and size reduction for those farms that continue over time. In the US, the Census of Agriculture data have been linked to show that many farm businesses go out of business and many new farms come into business (Ahearn, Korb, Yee, 2009). Considering the 5 censuses and 4 time periods between 1978-97, the rate of entry and exit varies somewhat—for two periods the entry rate exceeded the exit rate and for two periods the opposite was true--but entry rates overall were relatively stable, showing no strong upward or downward trend. Both the annualized entry and exit rates during the four subperiods ranged from 8 to 11

percent.[3] In farming, businesses enter at all sizes. Entry rates among small farm businesses, however, are significantly greater than for other farm sizes. Entry rates decline steadily as farm size grows, until farms reach a US mid-size range of 100 hectares or more. In addition, to the rates of exit and entry, it is interesting to consider the tendency of farms who stay in business, i.e., the survivors, to either expand or contract. The majority of surviving farms stay in the same size class from one census period to another. The smallest farms (under 20 hectares) have one of the highest shares of farms remaining in their size class. This size-tenure dynamic is not generally found in manufacturing industries, where the pattern is for smaller firms to increase in size over time. The small size class of farms, however, is likely dominated by those in operation largely to provide its operators with a farm residence, rather than serve as a viable commercial operation. Since family farms dominate agriculture across countries, the dynamic of farm size growth and survival will be commonly affected by the life-cycle of the farm family. However, it will likely vary considerably over countries due to variation in inheritance laws.

3.4 Pluriactivity or Off-farm Work

There are clearly large difference in the off-farm work of farm households between the US and member countries of EU. Table 3. reports participation for three time periods, 1987, 1997, and 2007. For the US, we report the share of principal operators that worked any days off the farm and the share of principal operators that had a nonfarm occupation as his or her major occupation. For the EU, for 1987 and 1997 "old", data are the share of operators that worked any days off the farm and for 1997 "new" and 2007, data are for the share of operators that had a nonfarm activity as the major or subsidiary occupation.

Farm operators in the US are more likely to work off the farm than farmers in the EU-15, with the exception of Sweden. Pluriactivity is not a new phenomenon in the US. Questions regarding off-farm work were included in the Census of Agriculture as early as 1929, where about 30 percent of farm operators reported being engaged in pluriactivity (Jenkins and Robison, 1937). As today, the extent varied significantly over farm size and space. Two states (Maine and Vermont) had nearly half (49 percent) of its operators report that they worked off the farm part-time in 1929. The high level of off-farm work participation for US farmers increased as recently as the last two Census for 2002 and 2007 (USDA, NASS). This increase was consistent with the increase in the share of small farms accounted for by the 2007 Census. Pluriactivity in EU member countries combined was 31 percent in 2007, compared to 65 percent in the U.S. However, there is a great deal of variation in pluriactivity across EU countries, ranging from 16 percent in Belgium to Sweden's 71 percent. Different member countries have also experienced higher rates of growth in the past decade, such as Denmark, Ireland, Sweden, and the UK.[4]

The high rate of off-farm work among farm operators in the US should not be surprising when we consider that more than half of all farms lose money farming in a typical year (e.g., 54 percent in 2007 according the ARMS). Perhaps, another factor explaining the US' greater off-farm work participation is the result of the lower government payments US farmers receive

[3] Entry and exit of farming businesses differs from changes in the use of land for agricultural purposes. Since 1978, the acres of land used in agriculture have declined. The 442 million acres of land used for cropland in 2002 was the lowest level since land-use estimates were made for 1945.

[4] Some of the variation may be due to variation in the farm definition.

compared to EU farmers. In the US, only about 40 percent of farms receive any government payments. The OECD provides various estimates of support, by commodity and country, using Producer Subsidy Equivalents (PSEs) (OECD, 2001a).[5] A comparison of the PSEs for the US and EU indicates that the EU's agricultural sector has consistently received a greater share of its returns from government support than in the US (Normile and Leetmaa, 2004). In the US, studies of off-farm work have shown that government payments are negatively related to off-farm work participation (El-Osta and Ahearn, 1996; Mishra and Goodwin, 1997). A study by Weersink, Nicholson, and Weerhewa (1998) points to the importance of differing policies, both farm and social, in explaining off-farm work between the US and Canada. They studied the off-farm work of dairy farm families in Ontario, Canada which is geographically similar to New York in the US. They concluded that the more generous and stable Ontario dairy policies and the government-provided medical care of Ontario were the major factors in explaining the differences in the observed lower rates of off-farm work of Ontario farm families.

Implications for Future Information Needs

It is recognized in the Handbook and elsewhere, that agricultural subsidies are facing a new era of public accountability. The implications of this new era are that conditions in--and connected to--agriculture must be made more transparent through enhanced indicators. Provision of improved indicators regarding the well-being of farm households is one obvious example. But, future public policy issues will be greatly informed by an indicator system that goes well beyond that single dimension.

The greater demand for accountability requires that information systems include a wide variety of indicators of the public returns from agriculture and rural development. It is for this reason, that we began this paper by arguing for an integrated and improved conceptual framework for the Handbook that accounts for all regions. Consider the most important issues that have recently and/or continue to face those concerned with agriculture and rural development:

- escalating food prices and economic insecurity of households and nations,
- the role of bioenergy production in fuel prices, energy independence and environmental externalities,
- the role of trade agreements and illegal immigration and rapid community change,
- the role of agriculture and forestry land uses in mitigating climate change impacts through carbon sequestration.

All of these examples are pressing international and national issues that are central to agriculture and rural territories, but not contained within any sphere that could be defined solely as agriculture or rural areas. It is also clear from this short list that scientific uncertainty pervades these issues, greatly challenging the development of useful indicators.

We turn now to the more narrow and tractable issue of implications for future information regarding agriculture, and family farms, in particular. The forthcoming Standard Output (SO)

[5] The PSEs accounts for 66% of the value of agricultural production in the US and 63% of the value of production in the EU.

measurements, destined to replace the EU's Standard Gross Margin (SGM) measures will facilitate cross-country comparisons between the EU and other countries. This is because of the greater simplicity of SO measures and because output mix and production technologies vary across countries. The classes of inputs that are considered in the measurement of SGM are not intuitive and inclusive for a wide variety of production technologies. For example, labor, while a variable input, is not included. Nor is energy included as a variable input. Both of these inputs vary significantly by commodity mix. However, the accounting treatment for various types of government subsidies to be included in SO measures, and size measurement based on output in other countries, is still in need of justification before a harmonized approach can be adopted. Also the "standardisation" in SO needs to be internationally standardized.

A further advancement in understanding the structure of farming would come from a longitudinal analysis of the entry, exit, and survival-growth dynamics. Such an analysis is only possible in countries that have panel data sets, such as Canada. A cross-country comparison for that subset of countries may prove insightful, if compared in light of the variation in domestic agricultural policies and inheritance laws.

As mentioned above, a mature information system should produce indicators that are capable of accounting for changing technology and family and business arrangements in agricultural production. The general public commonly considers farming to be a traditional activity, but we know the bulk of agricultural production (in contrast to the number of farms producing) is not produced under traditional technologies. Indicators that account for relatively new innovations in production, such as shared ownership or contracting, need to complement basic indicators. Of course, it must also be recognized that statistical agencies are increasingly challenged by the need to collect information from very large farms. A 2007 Invited Paper panel at the AAEA meetings provided a set of innovative approaches to data collection for economic research purposes in an increasingly concentrated sector, but these ideas are not easily transferable to indicator development (Fernandez-Cornejo, J. and R. Just, 2007; Hueth, B., E. Ligon, and C. Dimitri, 2007; Perloff, J. and M. Denbaly, 2007).

One important area for farm indicator development that is newly developing relates to the engagement of farms in the production of multifunctionality and nontraditional goods and services and has much in common with concepts of sustainability. These growth strategies include the production of nonmarket goods and services, such as environmental services. Governments are currently compensating farms for environmental and conservation services, including farmland preservation. Other activities associated with multifunctionality include community-oriented production aimed at local markets, such as Community Supported Agriculture and agritourism. Organic production and value-added production (such as jams from berries) are both marketed locally and distributed widely through traditional markets. Also included in the multifunctionality category of activities are energy-related production activities, such as wind energy and bioenergy sources. These activities are small, but growing, components of the agricultural activities in many countries and the focus of another paper at this meeting. Most of these activities are more commonly found on large farms, rather than small farms in the US (table 4). The exception to this generalization is for the large and growing area of direct sales. About 7 percent of farms with an ESU of less than 100 are engaged in direct sales, compared to 6 percent for the larger farms.

Conclusions

The most useful set of indicators regarding agriculture and family farms will place them in their larger contexts, within territories and within industries, in a flat world. For this reason, an integrated conceptual framework for indicator development could be highly productive. There are distinct forces driving the evolving structure and well-being of farms which expand the scope for indicator development: Innovations in technologies and business and family ownership and management arrangements are changing the way agricultural goods and services are produced and distributed in the supply chain. Pressure to further concentrate production will result from efforts to minimize costs and consumer prices. On the other hand, some of the market and nonmarket attributes of goods and services demanded by consumers may be linked to small farm production. In the future, governments may look to agriculture for solutions to nontraditional issues, such as climate change. Farm households that operate smaller farms and dominate the farm sector in numbers, though not in farm output, will continue to require access to income from off-farm sources if they choose to stay small; access to nonfarm opportunities in remote areas will be key to their survival. A key to developing relevant indicators for agriculture in a flat world is to understand in real time, or even better, to anticipate the forthcoming changes.

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Table 1a. Comparison of farm/holding size distribution measured in hectares, EU-15, NL, Italie, and the U.S., 1997

	Holdings (1000)			Land area (1000 hectares)		
	No.	% of all	%, exc. Small	No.	% of all	%, exc. Small
European Union						
Under 5 ha	3.902	56		7.008	5	
5-20	1.687	24	55	17.229	13	14
20-50 ha	802	11	26	25.459	20	21
50 to 100 ha	372	5	12	25.784	20	21
100 ha and over	226	3	7	53.211	41	44
total	6.989	100	100	128.691	100	100
NL						
Under 5 ha	35	32		72	4	
5-20	37	34	50	403	20	21
20-50 ha	29	27	40	919	46	47
50 to 100 ha	7	6	9	429	21	22
100 ha and over	1	1	1	187	9	10
total	108	100	100	2.011	100	100
Italie						
Under 5 ha	1.754	76		2.818	19	
5-20	424	18	76	3.970	27	33
20-50 ha	96	4	17	2.903	20	24
50 to 100 ha	27	1	5	1.868	13	16
100 ha and over	14	1	3	3.274	22	27
total	2.315	100	100	14.833	100	100
U.S.						
Under 5 ha	205	10		600	0	
5-20	365	18	20	4,187	1	1
20-50 ha	423	21	23	14,095	4	4
50 to 100 ha	355	17	19	25,913	7	7
100 ha and over	696	34	38	332,870	88	88
total	2,044	100	100	377,664	100	100

For U.S., includes all except 5,155 holdings with less than 1 hectare and with negative SGM.
Sources: For EU, Farm Structure Surveys. For US, USDA, NASS and ERS, ARMS.

Table 1b. Comparison of farm/holding size distribution measured in hectares, EU-15, NL, Italie, and the U.S., 2007

	Holdings (1000)			Land area (1000 hectares)		
	No.	% of all	%, exc. Small	No.	% of all	%, exc. Small
European Union						
Under 5 ha	3.033	54		5.515	4	
5-20	729	13	28	13.598	11	11
20-50 ha	1.230	22	48	20.400	16	17
50 to 100 ha	353	6	14	24.808	20	21
100 ha and over	264	5	10	60.225	48	51
total	5.608	100	100	124.546	100	100
NL						
Under 5 ha	21	28		46	2	
5-20	11	14	20	255	13	14
20-50 ha	33	43	60	702	37	38
50 to 100 ha	9	12	17	611	32	33
100 ha and over	2	3	4	301	16	16
total	77	100	100	1.914	100	100
Italie						
Under 5 ha	1.230	73		2.021	16	
5-20	203	12	45	3.109	24	29
20-50 ha	206	12	46	2.599	20	24
50 to 100 ha	27	2	6	1.839	14	17
100 ha and over	13	1	3	3.177	25	30
total	1.679	100	100	12.744	100	100
U.S.						
Under 5 ha	251	12		752	<1	
5-20	525	24	27	6,140	2	2
20-50 ha	485	22	25	16,097	5	5
50 to 100 ha	341	16	18	24,158	7	7
100 ha and over	576	26	30	308,602	87	87
total	2,179	100	100	355,750	100	100

For U.S., includes all except 17,946 holdings with less than 1 hectare and with negative SGM.
Sources: For EU, Farm Structure Surveys. For US, USDA, NASS and ERS, ARMS.

Table 2a. Comparison of farm/holding size distribution measured in ESU, EU-15, NL, Italie, and the U.S., 1997

	Holdings (1000)			Land area (1000 hectares)		
	No.	% of all	%, exc. Small	No.	% of all	%, exc. Small
European Union						
0 to <2	2.357	34		7.422	6	
2 to<4	1.174	17		5.448	4	
4 to <8	1.039	15	30	8.719	7	8
8 to <16	840	12	24	13.067	10	11
16 to <40	843	12	24	27.429	21	24
40 to <100	536	8	15	35.432	28	31
100 or more	201	3	6	31.196	24	27
total	6.991	100	100	128.712	100	100
NL						
0 to <2	0	0		0	0	
2 to<4	1	1		3	0	
4 to <8	10	9	9	36	2	2
8 to <16	13	12	12	78	4	4
16 to <40	19	17	17	189	9	9
40 to <100	33	30	31	624	31	31
100 or more	33	30	31	1.080	54	54
Total	108	100	100	2.011	100	100
Italie						
0 to <2	1.072	46		1.371	9	
2 to<4	451	19		1.328	9	
4 to <8	336	14	42	1.959	13	16
8 to <16	215	9	27	2.297	15	19
16 to <40	162	7	20	3.105	21	26
40 to <100	59	3	7	2.315	16	19
100 or more	21	1	3	2.458	17	20
Total	2.315	100	100	14.833	100	100
U.S.						
< 0	556	27		35,652	9	
0 to <2	389	19		24,389	6	
2 to<4	158	8		10,555	3	
4 to <8	161	8	17	15,874	4	5
8 to <16	143	7	15	19,911	5	6
16 to <40	226	11	24	52,220	14	17
40 to <100	221	11	23	81,733	22	27
100 or more	190	9	20	137,328	36	45
total	2,044	100	100	377,662	100	100

For U.S., includes all except 5,155 holdings with less than 1 hectare and with negative SGM.
Sources: For EU, Farm Structure Surveys. For US, USDA, NASS and ERS, ARMS.

Table 2b. Comparison of farm/holding size distribution measured in ESU, EU-15, NL, Italie, and the U.S., 2007

	Holdings (1000)			Land area (1000 hectares)		
	No.	% of all	%, exc. Small	No.	% of all	%, exc. Small
European Union						
0 to <2	1.565	28		6.932	6	
2 to<4	928	17		4.282	3	
4 to <8	887	16	28	7.073	6	6
8 to <16	704	13	23	10.404	8	9
16 to <40	720	13	23	22.476	18	20
40 to <100	514	9	16	33.159	27	29
100 or more	291	5	9	40.220	32	35
Total	5.608	100	100	124.546	100	100
NL						
0 to <2	0	0		0	0	
2 to<4	1	1		3	0	
4 to <8	8	10	10	30	2	2
8 to <16	9	12	12	64	3	3
16 to <40	13	17	17	171	9	9
40 to <100	19	25	26	481	25	25
100 or more	27	35	36	1.165	61	61
Total	77	100	100	1.914	100	100
Italie						
0 to <2	568	34		688	5	
2 to<4	350	21		826	6	
4 to <8	293	17	39	1.298	10	12
8 to <16	188	11	25	1.544	12	14
16 to <40	160	10	21	2.635	21	23
40 to <100	80	5	10	2.474	19	22
100 or more	40	2	5	3.279	26	29
Total	1.679	100	100	12.744	100	100
U.S.						
< 0	668	31		36,138	10	
0 to <2	515	24		24,664	7	
2 to<4	159	7		9,213	3	
4 to <8	160	7	19	11,885	3	4
8 to <16	123	6	15	14,682	4	5
16 to <40	187	9	22	40,488	11	14
40 to <100	147	7	18	57,134	16	20
100 or more	219	10	26	161,545	45	57
total	2,179	100	100	335,750	100	100

For U.S., includes all except 17,946 holdings with less than 1 hectare and with negative SGM.
Sources: For EU, Farm Structure Surveys. For US, USDA, NASS and ERS, ARMS.

Table 3. Percent of farm operators/holders with any off-farm work

	OLD	OLD	NEW	NEW
Area	1987	1997	1997	2007
	Percent			
U.S., any days	57	58	58	65
U.S., nonfarm major occupation	46	50	50	55
EUR, 12	30			
EUR, 15		37	29	31
Belgium	33	19	17	16
Denmark	33	36	35	48
Germany	43	49	45	48
Greece	33	31	27	23
Spain	28	44	28	32
France	36	29	25	25
Ireland	36	34	33	47
Italy	24	31	24	28
Luxembourg	18	33	17	19
Netherlands	23	25	22	28
Austria		51	39	38
Portugal	39	39	33	25
Finland		52	49	43
Sweden		62	59	71
United Kingdom	24	39	30	42

For EU, New is other gainful activity as the major or subsidiary occupation. In 2007, number of holdings and, in 1997, number of persons. For U.S., source is Census of Agriculture for the principal operator. For EU, source is Farm Structure Surveys.

Table 4.—Structural and multifunctionality characteristics of U.S. farms by ESU, 2007

Item	European size unit		
	< 100 ESU	100 or more ESU	All
Number of farms	1,958,351	219,023	2,177,374
Percent of farms	89.9	10.1	100.0
Number of family farms*	1,918,008	205,985	2,123,993
Percent of family farms*	90.3	9.7	100.0
Average number of hectares	99	738	163
Percent of hectares	54.6	45.4	100.0
Average value of production, Euro	20,726	803,391	99,455
Share of value of production	18.7	81.3	100.0
Average government commodity payments, Euro	796	14,962	2,221
Share of government commodity payments	32.2	67.8	100.0
Average government conservation payments, Euro	646	1,792	761
Share of government conservation payments	76.3	23.7	100.0
		Percent of farms	
Structural Characteristics			
Marketing or Production Contracting	6	48	10
Own all acres operated	70	23	65
Use of hired manager	<1	3	1
Use of hired labor	26	79	31
Ownership shared outside household	10	27	11
Use of borrowed capital			
Non-real estate debt	11	41	14
Real estate debt	19	48	22
Farm business debt-asset ratio >=0.10	16	48	19
Commodity specialization	54	92	58
Multifunctionality Activities			
Agritourism	2	2	2
Government landscape conservation program	15	24	16
Government conservation practices program	1	4	1
Fallow and cover crop	18	25	19
Conserving tillage practices	19	61	23
Intensive management grazing	20	24	21
Organic production	1	2	1
Energy production (wind, solar)	1	2	1
Community-oriented marketing:	7	6	7
Community sponsored ag	<1	1	0
Value added ag	2	3	2
Direct sales	6	4	6

Source: 2007 USDA Agricultural Resource Management Survey. Alaska, Hawaii, and US territories are excluded from the surveys. Excludes farms of < 1 ha. with a farm loss. *Farms where 50% or more of assets are owned by related individuals.