

# A National Agricultural Survey in Ukraine Using Multiple Frame Methods

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## 1. Abstract

Prior to 1992, when Ukraine was part of the Soviet Union, an administrative census was used to collect information about Ukraine's agricultural sector. The approach used, required all 12,000 state and collective farms in Ukraine to report. This system is still being used but is fast becoming obsolete. With the movement of the agricultural sector towards privatization, the Government of Ukraine (GU) can no longer rely on its historical administrative census for "tracking" changes within the agricultural sector. The sector has changed from one which relied almost exclusively on the productivity of 12,000 state and collective farms to one that includes 14,000 collective agricultural enterprises (CAEs), over 30,000 private farms and 7.5 million household plots. **Clearly the value of this paper is that the methods we used will apply to most former Soviet Union countries.** Moreover, the data we generated using multiple frame surveys were published ahead of the traditional estimates and were more accurate because the multiple frame estimates accounted for the household plots and the private sector farms. The traditional system did not cover private sector farms or household plots.

GU officials understand that they need more advanced methods based on sampling in order to improve their efficiency in producing statistical data that better "tracks" the changes in Ukrainian agriculture. GU officials and donor project managers are aware that improved data are required. This paper summarizes the results of the first year during which two surveys were conducted.

## 2. Introduction

This project was particularly important given recent changes taking place in the agricultural sector. The efficient transition to an open economy requires that decision-makers understand the implications of their decisions and monitor sector changes in order to modify policy when needed.

During this dynamic transition, it is not just the government that makes decisions. Farm managers are making decisions based on their understanding of the prices and markets; poultry producers may be delaying investments based on their understanding of world prices and the potential impact of imports. Collective and state farms and private farm decision-making will in large part determine Ukraine's ability to respond to a more open policy framework. Their decision-making ability requires timely information based on sound statistical and economic analysis.

## 3. Methodology

The methodology of this project included: 1) identifying the main data users and data requirements, 2) designing the survey that collects required data, 3) designing survey instruments, and 4) training office staff and enumerators to collect, edit, enter, process and summarize the data

collected.

The sample design involved an area frame in all 25 oblasts and the joint use of both an area frame and a list frame of restructured farms in Lviv Oblast in order to maximize information about USAID's farm restructuring project. A sample of 142 former collective and state farms (primary sampling units -- PSUs) was selected with probabilities proportional to size (PPS) where size was the sum of hectares in crops, pasture and hay. A listing form then was used to identify: 1) the number and land area of the private farms, 2) the number of the household plots, and 3) number and size of the collective agricultural enterprises (CAEs). Seventy PSUs were selected in Lviv Oblast 50 PSUs from the area frame and 20 from the list frame. Seventy-two PSUs were sampled in the rest of Ukraine, three in each of 24 oblasts.<sup>1</sup> Two survey rounds were conducted (July and November 1999) in order to collect data about both the summer and winter growing cycles.

Enumerator teams visited each selected land area and listed different types of farm operations including the public sector farms now called CAEs, private sector farms and household plots. During the two survey periods, data were collected on 500 variables and over 300 tables were generated. There were 1476 questionnaires generated in each survey. The measurement of precision for individual estimates is stated as coefficients of variation (CV).

Since USAID was interested in evaluating their farm-restructuring project in Lviv Oblast, a list of all 66 restructured farms was obtained from the implementing institution. A traditional multiple frame estimator was used to estimate agricultural production in the Lviv Oblast. In addition, data from each frame was used separately in order to compare restructured and non-restructured farms.

#### 4. Results

Survey data provides a baseline for the agricultural sector in Ukraine in seven sections: demographic characteristics of farm households, farm structure (including estimates of gross income for farm households/organizations), farm practices, crops – summary, crops – individual, livestock – summary, and livestock – individual.

With the exception of Lviv Oblast, the sample size at the oblast level was small consisting of three PSUs per oblast. However, the overall sample size was large enough to give reliable estimates at the national level for most data items. In addition, for frequently occurring items, the sample size in Lviv Oblast is also large enough to provide reasonable estimates. However, as a result of the sampling methodology used, no estimates are provided for oblasts other than Lviv. Instead, estimates for these other oblasts are aggregated to a single entry in the relevant tables labeled "other oblasts". The following table shows some estimates with their associated CVs.

Table 1: Coefficients of Variation for Selected Variables.

Category	Estimates (number)	Coefficient of Variation (percent)
Total Farms	7,471,000	6.3
Household Plots	7,423,000	6.4
Private Farms	29,000	18.8
Public Sector Farms	13,100	7.9
Agricultural Land (ha.) 1/	33,980,295	6.9

<sup>1</sup> The small sample size utilized in the oblasts other than Lviv was dictated by cost and time constraints. A sample of this size allows providing estimates at the national level but not at the oblast level (with the exception of Lviv Oblast).

WHEAT:		
Total Area Planted (ha.) 2/	6,760,300	8.0
Total Production (tons)	14,930,800	8.5
CATTLE:		
Cattle Farms	5,037,300	7.2
Total Cattle	15,220,100	5.5
PIGS:		
Pig Farms	5,667,700	7.6
Total Pigs	18,062,300	7.5

1/ Includes areas in arable land, tree crop areas, pasture and meadow areas.

2I/ ncludes farms/areas planted in winter and spring crops for harvest in 1999.

## 5. Results in Lviv Oblast

Since data were collected from restructured and non-restructured farms in Lviv Oblast (two frames), we were able to compare data collected from the two types of farms. There was a separate paper written comparing these data in Lviv Oblast<sup>1</sup>. Our survey was not an evaluation of the contractor's work as such; it was an evaluation of the concepts of USAID's farm restructuring project, the Land Shares Project. The Objective of the Land Shares Project was to evaluate whether or not restructuring farms makes them more efficient and productive.

A comparison of data for restructured and non-restructured farms in 16 different tables using several hundred variables indicated that restructuring farms did not make them more profitable, efficient or productive. Although farm restructuring may be a necessary condition for farms to become profitable, it is not sufficient in and of itself to make the farms more efficient. In the interim, donor agencies might examine the feasibility of employing a multi-directional support effort to ease the movement towards privatization in the sector. One method that might be considered to assist public sector farm managers improve their management skills in modern day management activities such as how to read markets when making planting/ production decisions, accessing credit (when it becomes available) and evaluating alternative product/production possibilities in order to experience comparative advantages in domestic and international markets. A pilot project could be designed to test the feasibility of utilizing this technique coupled with the "top-down" approach now being advocated. If successful, the multi-directional approach could ease the movement towards privatization and liberalization and, in the long run, make the transition more likely to succeed.

## 6. Results in Ukraine

Table 2 shows data from our survey compared to data from the State Statistics Committee of Ukraine (SSCU). Data from our survey would normally be available one month after data collection. Data from the SSCU was available in February 2000.

We found some interesting comparisons. For example, the most important grain is wheat and the two estimates differ by less than 12 % but SSCU estimates for Public sector farms only. When we compare the survey estimates with SSCU public sector estimates we differ by less than 2%. The number of cattle differed by 22%. However, SSCU staff did not estimate cattle for the household

<sup>1</sup> An Evaluation of USAID's Support for Land Privatization in Lviv Oblast, John G. Litschauer, PhD  
Agricultural Assessments Corporation, 2606 Ritchie-Marlboro Road, Upper Marlboro, MD, 20774, May 2000.

plots and the survey did estimate cattle household cattle. We pointed out that our survey found the additional 22% cattle in households where SSCU does not survey.

## REFERENCES

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## RÉSUMÉ

Avant 1992, dans le cadre de l'ex-Union Soviétique, les informations concernant le secteur agricole ukrainien étaient recueillies au moyen d'un recensement administratif. Selon cette approche, les 12000 exploitations agricoles d'Etat et coopératives agricoles de production de l'Ukraine étaient tenues de communiquer des renseignements sur la plupart des aspects des activités agricoles. Ce système est encore utilisé, mais il est devenu obsolète. Avec l'évolution du secteur agricole vers la privatisation, le gouvernement ukrainien (GU) ne peut plus s'en remettre exclusivement à son recensement administratif classique pour "suivre" les changements qui s'y produisent. Le secteur a changé: jadis tributaire quasi exclusivement de la productivité des 12000 exploitations agricoles d'Etat et coopératives, c'est maintenant un secteur qui comprend 14000 entreprises agricoles collectives (CAE), plus de 30000 fermes privées et 7,5 millions de lopins familiaux qui contribuent de façon significative à la productivité globale du secteur.

Les fonctionnaires du GU comprennent qu'ils ont besoin de méthodes plus avancées, fondées sur l'échantillonnage, pour améliorer leur efficacité dans la production de données statistiques qui "suivent" mieux les changements qui se produisent dans l'agriculture ukrainienne. Fonctionnaires du GU et gestionnaires de projets des bailleurs de fonds ont conscience de la nécessité de disposer de données améliorées. Cette note résume les résultats de cette première année où deux enquêtes ont été réalisées pour obtenir des renseignements sur les cultures d'été et d'hiver.