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המרכז למחקר בכלכלה חקלאית  
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המחלקה לכלכלה חקלאית ומנהל  
The Department of Agricultural  
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**Ukraine after 2000:  
A Fundamental Change in Land  
and Farm Policy?**

by

**Zvi Lerman, David Sedik, Nikolai Pugachev,  
and  
Aleksandr Goncharuk**

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P.O. Box 12, Rehovot 76100

ת.ד. 12, רחובות 76100

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June 2006

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## **Acknowledgments**

This paper is based on a study conducted in 2005-2006 as a collaborative effort of three institutions: the Policy Assistance Branch of FAO's Regional Office for Europe and Central Asia (REUP) in Rome, the UNDP-sponsored Agricultural Policy for Human Development (APHD) project in Kiev, and the Institute of Sociology, also in Kiev. David Sedik as the Head of REUP was responsible for the overall design, management, and coordination of the study. Vladimir Artyushin and Nikolai Pugachev from the APHD project were in charge of the local implementation of the study in Ukraine, including collection and analysis of sectoral data. Yurii Privalov, Aleksandr Goncharuk, and Maria Olenina from the Institute of Sociology were responsible for the implementation of a survey of some 1,400 rural households, peasant farms, and corporate farms in 8 oblasts in Ukraine. Zvi Lerman from the Hebrew University of Jerusalem provided overall scientific guidance for the survey and, together with David Sedik, carried out the final analysis. The full text of the study in electronic format can be requested from Zvi Lerman [lerman@agri.huji.ac.il](mailto:lerman@agri.huji.ac.il) or David Sedik [David.Sedik@fao.org](mailto:David.Sedik@fao.org).

## Executive Summary

Land and farm reform in Ukraine began more than 15 years ago and has proved to be a lengthy and difficult process. The first round of farm reforms in 1992-93 initiated privatization of land through the distribution of paper shares to the rural population and mandated the transformation of former collective and state farms into corporate shareholder structures. The second round of reforms began in December 1999 when the corporate farms were obliged by presidential decree to convert the paper land shares into fully titled land plots for their shareowners. The land received through the conversion of the share certificates could be used to establish a new private farm or to enlarge an existing household plot. Corporate farms could continue to use the land represented by privately owned land shares only if they signed a formal lease contract with the landowners.

FAO marked the five-year anniversary of the 1999 landmark decree by launching a monitoring study to assess the outcomes of reform since 2000 and to formulate a set of policy recommendations based on the post-2000 reality in the rural sector. Official national statistics were used to construct a picture of sectoral changes, while data collected in a questionnaire-based survey of nearly 1,400 respondents in the spring of 2005 made it possible to conduct a comparative farm-level analysis of the reform impacts in the two main sectors of Ukrainian agriculture – corporate farms and individual farms.

### **Change of land policy and GDP growth spur sectoral recovery after 1999**

Following the 1999 land reform nearly 7 million rural residents became owners of physical land plots, not just paper shares, and about 65% of arable land is now physically owned by rural individuals. The Ukraine land reform may provide an important source of income for rural residents, as the average landowner should earn about 400 hryvna per year by renting out his land, the equivalent of two and one half months of wages. However, the new landowners are prohibited from selling their land because of a moratorium that remains in force until January 2008 (and may be extended to 2012).

The 1999 reform has led to the emergence of a new wave of “private” corporate farms organized by a single entrepreneur on land leased from rural landowners. As of 2004 there were over 4,000 such “private” corporate farms or almost 25% of the total number of corporate farms in Ukraine. The remaining 12,000 corporate farms were organized as “business” companies (*hospodarski tovaristva*), including joint stock companies, limited liability companies, agricultural cooperatives etc.

**The ongoing process of reform has totally changed the face of Ukrainian agriculture: from agriculture with predominant concentration of production in collective farms it has evolved into agriculture characterized by clear dominance of individual farms.** Corporate farms today control less than 60% of agricultural land (down from nearly 95% prior to the start of reforms in 1990) and contribute about 30% of gross agricultural output (down from 70% in 1990). The individual sector (consisting of the traditional household plots and the independent peasant farms that began to emerge after 1992) controls today more than 40% of agricultural land, contributing 70% of agricultural output. Within the individual sector, the main contribution to agricultural production is from household plots, not peasant farms, as they also control much more land (33% versus 8%).

**The transfer of agricultural land from corporate to individual farms accelerated markedly in 1999:** the share of the individual sector in agricultural land increased from 6% in 1990 to 17% in 1998 and then soared to 41% in 2004. The increased share of individual farms in land is reflected in increased size of holdings because the total agricultural land in Ukraine has remained constant at 42 million hectares. Thus, the average peasant farm increased from 25-30 ha in 1998 to 70-80 ha in 2003-2004, while household plots grew from an average of 1 hectare in 1992-99 to 2.5 hectares in 2004.

The 1999 reforms have also affected the performance of Ukrainian agriculture. **The agricultural output from both individual and corporate farms made a spectacular recovery in 1999**, as it grew by 30% (in constant prices) between 1999 and 2004. The recovery has been largely due to growth in the individual sector, but some spillover effects are also observed among corporate farms (where the decline in output stopped in 2000 and the number of unprofitable farms dropped from almost 100% in 1997-99 to around 40% in 2000-2004). It is tempting to attribute the sudden improvement in farm performance to the turnaround in government's agricultural policies. In fact, however, the increase in agricultural output paralleled the increase in GDP and may have been one of the manifestation of general economic recovery in Ukraine.

**The two partial productivity measures – the productivity of agricultural land and the productivity of agricultural labor – also show signs of recovery since 1999.** The productivity of agricultural land rose from 1,200 hryvny per hectare (in 2000 prices) in 1999 to 1,600 hryvny per hectare, an increase of one-third, reflecting primarily the growth of agricultural output (since the total agricultural land remained roughly constant). The increase in the productivity of agricultural labor was even larger: from 10,000 hryvny per worker in 1999 to more than 15,000 hryvny per worker in 2004, but a large part of this increase may be due to a change in the methodology of labor surveys that dramatically depressed the reported number of agricultural workers starting in 2002.

### **Farm reorganization: rural people are now less dependent on the local corporate farm**

Collective agricultural enterprises (CAE), the new organizational form that dominated the pre-1999 farm structure in Ukraine, have completely disappeared since 1999. Corporate farms are now mainly represented by limited liability companies and private lease enterprises. While the number of shareholders in corporate farms ranges from 1 to 1,600, fully 16% are single-shareholder entities and 31% have from 1 to 3 shareholders only.

Two-thirds of the rural households surveyed received their land shares at least in the form of paper certificates and more than half received them in the form of a physical plot. These share assignment rates are substantially higher than in previous surveys (1994, 1996). However, only peasant farmers have kept the land received in the process of reform for their own use. Households mainly lease out their land to the local corporate farms, and retain a relatively small portion for their own use. There is a clear preference on the part of the rural population for leasing their shares, not investing them in corporate equity.

The local corporate farm has lost its role as the main rural employer. Only 20% of the adults in the survey report that their main employment is with the corporate farm, compared with 67% in 1996. **Fully two-thirds of respondents have no relations with the corporate farm.**

Those who have no relation with the local corporate farm work mainly on the family farm and in nonagricultural jobs.

### **Land and land markets: significant reliance on leasing contracts**

There are huge gaps in size between the three main categories of farms: the mean size in the survey is 1,700 hectares for corporate farms, 140 hectares for peasant farms, and 1.7 hectares for household plots. The corporate farms are still much larger than in market economies (500-600 hectares per corporate farm in the U.S.), while the household plots are still much smaller than the average family farm in market economies (130 hectares in land-rich U.S., 20 hectares in EU-15). The size gaps perpetuate the strong duality of farm structure that characterized Soviet agriculture.

In household plots the land used for farming is just 36% of the family's total land holdings and the rest is leased out. More than half the rural families lease out at least some of their land, while leasing in by households is marginal (3% of respondents). The few families who lease in land cultivate much larger holdings: nearly 16 hectares compared with 1-2 hectares for the rest. The entire difference is leased land. Growth of the much larger peasant farms is also entirely attributable to land leasing: farms with leased land achieve sizes in excess of 200 hectares, while farms without leased land average 50 hectares only. Of the 140 hectares in an average peasant farm, only 18% is owned land, while the remaining 82% is leased from other landowners or from the state. Thus, on the whole, peasant farmers follow a totally different leasing strategy: **most peasant farmers lease in land to enlarge the cultivated area, while most rural households lease out land that they cannot cultivate.**

Corporate farms, unlike peasant farms and household plots, have very little own land and they rely primarily on land leased from individuals (members, shareholders, and other rural landowners). In the present circumstances only a small minority of shareholders and other lessors actually work in the corporate farm: most are passive landowners who entrust their land to the corporate farm without expecting the security of a wage job.

The average lease payments in the survey are around 100 hrivny per hectare per year (based on the answers of both lessors and lessees). Rural families that lease out land earn 500-550 hrivny a year in lease payments.

While the participation rates in land lease markets are quite high, the market for buying and selling of land is still hopelessly undeveloped: nobody in the survey reported selling land and only 5% of peasant farmers reported buying land in the last 5 years. In these few cases, buying, like leasing, has a positive impact on farm sizes, strengthening the overall impression that land market transactions are indeed conducive to farm enlargement. There is still considerable resistance to the very notion of buying and selling land, especially among corporate farm managers and household plot operators, less so among peasant farmers. Yet nearly 30% of household plot operators think they will be able to buy more land for their plot if they so desire in the future, while peasant farmers and farm managers expect to rely more on leasing from private individual to enlarge their farms.

## **Changing business environment: private trade has replaced state supply and procurement**

Respondents from the individual farming sector – peasant farmers and heads of rural households – provide a much more positive evaluation than corporate-farm managers of the overall effect of the changes associated with the second-wave reforms. The managers' view is less enthusiastic because corporate farms have been faced since 2000 with labor force shrinkage, reduction of output, erosion of farm profits, and an increase of the tax burden.

The reduction of farm production notwithstanding, farm managers give a positive assessment of the change in the behavior variables among farm workers. **The traditionally problematic behavioral attributes, such as work discipline, motivation, theft and pilfering, or drinking, are better today than in the past.**

Managers complain that the access to purchased inputs is worse now than before 2000. Yet a quantitative analysis shows that around **80% of both managers and peasant farmers manage to buy inputs, and roughly half this number actually buys all that they need.** Private trade – commercial suppliers and private individuals – is the main channel for farm inputs today. Although state suppliers continue to play an important role, they are far behind the commercial trade channels and their role has declined dramatically over time.

**There is no evidence of acute shortage of farm machinery in the survey.** Around 90% of both corporate and peasant farms report tractors and harvesters, as well as a complement of light machinery. The much larger corporate farms naturally have a larger machinery pool: 67 pieces of various farm machines per corporate farm compared with only 11 pieces per peasant farm. The machines used by corporate farms are larger and more expensive than those in peasant farms. Both corporate and peasant farms rely mainly on own machinery, although rentals are reported with considerable frequency. Most of the **rented equipment originates from private sources: access to state leasing programs is virtually nonexistent in the survey.** Household plots have a much smaller machinery complement: on average 3 pieces per household, of which only 1 piece is heavy equipment (a tractor or a harvester). Rural households rely much more heavily on equipment rentals and jointly purchased machinery, presumably because of capital constraints.

**Managers are far less constrained by the directives of the regional authorities and have more freedom in making economic and business decisions than before 2000.** Access to credit is reported to have improved, although this effect may be a purely subjective feeling due to the persistence of soft-budget constraints and write-offs at the regional level. Regional authorities claim that they have no influence over the allocation of agricultural credit and that these issues are decided directly by the commercial banks.

## **Rural social sphere: households now pay for services**

The responsibility for the rural social assets has been largely transferred from corporate farms to the local municipality. **The corporate farms continue the traditional policy of providing support to household plot production.** This includes assistance with plot cultivation and farm sales, provision of farm inputs, transport, and even purchase of consumer goods. **Today, however, the households cover most of the costs incurred by the**



**corporate farm** and household support in the survey is about 0.5% of the total annual expenditure of the average farm.

### **Farm production and sales: even household plots are not pure subsistence operations**

The value of production shows order of magnitude differences across the spectrum of corporate farms, peasant farms, and household plots, which reflect the differences in land use. Both corporate and peasant farms concentrate on mixed primary agriculture (crops and livestock), with relatively little diversification into nonagricultural activities. Crop production dominates the product mix in corporate and peasant farms, while household plots continue with evenly balanced crops and livestock. Corporate and peasant farms produce mainly cereals, while household plots allocate a significant share of their land also to potatoes and vegetables.

Although peasant farms have a smaller share of livestock in their product mix than corporate farms, a definite convergence is observed, which may reflect capital accumulation in peasant farms since 1998. Many farm managers and peasant farmers express their intention to increase livestock production subject to feed availability, although farms with livestock show significantly lower profit margins than crop-specialized farms. The attitude toward livestock is apparently still driven by emotions, not by profitability, although **regional authorities no longer intervene in livestock production decisions at the farm level.**

Corporate farms and peasant farms are true commercial producers, selling most of their output (mainly for cash, not barter). Household plots on average sell only 20% of their output, but even with these levels of commercial activity they cannot be regarded as pure subsistence operations: nearly two-thirds of household plots surveyed report some farm sales and 10% sell more than half their output (like the true commercial producers). The stigma of subsistence farming attached to household plots is not entirely justified: **household plots are in fact semi-commercial farms.** The share of output sold by household plots increases with plot size, which suggests that **the level of commercialization of household plots will increase if they are allowed to grow beyond the current limits through land market mechanisms.**

All farms sell mainly through private channels, including commercial traders and privatized processors. Sales to state procurement and the former consumer cooperative system are negligible. Household plots are distinguished by a relatively high share of direct sales to the consumers in the marketplace.

### **Farm debt and access to credit: increasing reliance on banks and suppliers**

Both corporate and peasant farms have a perception of significant access to credit: 63% of corporate farm managers and 34% of peasant farmers report that they actually borrow. The access to credit has improved over time, and managers of corporate farms indicated that the credit situation today was better than before 2000. Rural households borrow much less frequently (15% of respondents).

Banks and input suppliers are the main sources of credit for corporate and peasant farms. Commodity credit or credit in kind plays a marginal role in the survey, while wage arrears or debt for taxes and social deductions do not appear to be a problem. The state has practically disappeared as a source of credit for peasant farms. Formal credit is gradually replacing informal borrowing from relatives and others in the individual sector.

Agricultural producers typically borrow for 12 months at annual interest rates of around 19%. Given inflation rates of around 9% in 2004, the real cost of agricultural borrowing in Ukraine is 9-10% annually, which is quite high by world standards. The respondents generally complained that the interest rates were too high and the credit term too short: an acceptable interest rate for future borrowing would be 8% with credit term of 3 to 4 years. These acceptable interest rates are equivalent to zero (or even negative) real interest, which is not attainable economically.

Borrowing from the banks naturally requires collateral, which most corporate and peasant farms manage to provide. Lack or insufficiency of collateral was perceived as one of the three main obstacles to borrowing (after high interest rates and short credit term).

Contrary to the situation in the past, the level of indebtedness is not particularly high: the average farm debt can be paid off with 6-7 months of sales revenue. For corporate farms, the situation in 2005 appears to be a significant improvement compared with 1998, when debt-to-sales ratios were around 2 years and farm indebtedness was a major concern. Farm profitability has also improved significantly since 1998, but farms with debt still have lower levels of profitability than farms without debt.

### **Investment plans: farms have ambitious investment goals for the future**

All respondents have extensive investment plans for the future, which is a sign of general optimism and considerable confidence in the economy. Two-thirds of commercial producers (corporate farms and peasant farms) plan to invest in production assets, with purchase of farm machinery and livestock at the top of the list of priorities. Rural households are evenly divided between those planning farm investments (also mainly machinery and livestock) and those planning consumption investments (i.e., build a house, buy a car, buy household durables).

The reported investment plans are quite ambitious, estimated at 33% of sales revenue for corporate farms and 53% for peasant farms. The total estimate investment costs are 5 to 8 times the actual amounts invested in 2004, which is clearly another reflection of the high degree of optimism concerning the future.

Managers and peasant farmers plan to finance their investment with a mix of own funds (savings) and bank credit, while rural households intend to rely mainly on family savings. Managers list leasing as one of the options for financing investment (primarily for machinery, but also for livestock and processing equipment), although in practice this channel has been used only marginally.

## **Rural employment: farm labor is “just right”**

Among families of peasant farmers, the farmer himself works primarily on the family farm and it is the spouse who is the main source of income diversification: 21% of spouses hold hired jobs and another 5% report self-employment outside the household. Heads of rural households and their spouses diversify to a much greater extent: fully 40% have an off-farm job as their main occupation. Still work on the family farm is a major factor in time allocation: heads of rural households work on the family plots for 8.6 hours a day during 295 days a year; those who also work in the corporate farm devote “only” 7.6 hours per day to their household plot for 301 days a year (compared to 247 days that they give to the corporate farm).

The average corporate farm in the survey employs between 120 and 130 permanent workers, with seasonal labor adding about 16% to the permanent labor force. Peasant farms employ on average less than 9 people, of which 3 are family members. Virtually all peasant farms report work inputs from family members, but only one-half engage hired labor. Overall, the family members contribute 55% of the total labor input in peasant farms, whereas hired workers contribute 45%. The differences in the number of employed in corporate and peasant farms are largely explained by differences in farm size.

The respondents appear to be satisfied with the labor situation. More than half the farm managers are of the opinion that their labor force is “just right” and only 2% admit that there are redundancies of farm labor. Labor shortages do not appear to be a serious problem among the farms surveyed, as only 40% of respondents in both corporate and peasant farms complain that they face shortage of labor. Peasant farms experience shortage of unskilled manual labor, whereas corporate farms need more skilled labor (machine operators, farm specialists). The number of unskilled workers needed is greater than the number of skilled workers for farms of both types.

Non-competitive low pay is an important factor in the inability to hire, but the main obstacle seems to be labor supply difficulties. There is lack of sufficiently qualified labor, there are problems with the age structure of labor, applicants suffer from “bad habits” (i.e., drinking, unreliability), and people simply have no motivation to work (they register at the labor exchange, but do not accept farm jobs).

## **Farm productivity: no advantages to large-scale corporate farms**

From theoretical considerations we expect the productivity of small individual farms to be higher than the productivity of large corporate farms. We thus expect an overall productivity ranking household plots > peasant farms > corporate farms. Indeed, household plots achieve the highest productivity of land (measured by the value of output per hectare), but the land productivity in corporate and peasant farms is roughly the same. Nevertheless, regression analysis shows that the productivity of land decreases with farm size both in the entire sample (all three farm types) and in the subsample consisting of corporate and peasant farms only. Productivity of labor, on the other hand, is higher in corporate farms than in peasant farms (no estimation for household plots was possible).

Accounting-based calculations of total factor productivity (TFP) as the ratio of the value of sales or value of output to the reported costs show that, consistently with our expectations,

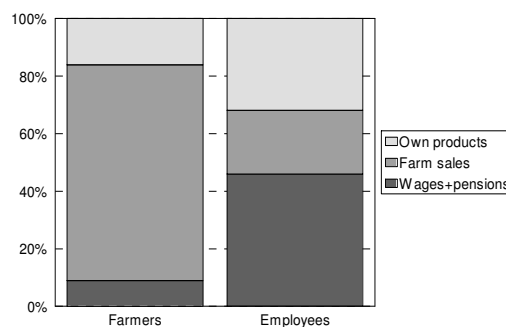
the accounting TFP is somewhat higher for peasant farms than for corporate farms (1.5 and 1.3, respectively, which means that the value of sales is 50% higher than costs for peasant farms and 30% higher than costs for corporate farms). On the other hand, attempts to estimate total factor productivity (TFP) by econometric production-function techniques did not produce conclusive results: the TFP scores were not significantly different for corporate and peasant farms. While these results do not demonstrate the expected productivity advantage of individual farms, they establish convincingly that **corporate farms are not more productive than peasant farms: we do not observe economies of size operating among Ukrainian farms, and farms of all types should be allowed to evolve on a level playing field.**

### Rural family incomes: peasant farmers earn more, while employee households diversify more

Incomes were estimated for two categories of rural families – peasant farmers operating an independent family farm (“farmers”), and other rural families operating a traditional household plot in addition to wage employment or reliance on social insurance (“employees”). Farmers earn much more than employees both per family and per capita. The average yearly income for farmer families is 54,500 hryvny, compared with less than 10,000 hryvny for employees. For farmers most of the cash income is from farm sales and a very small share comes from salaries and pensions. Employees, on the other hand, rely to a much greater extent on salaries and pensions and less on farm sales. Another component that differentiates between farmers and employees is income from property (i.e., lease payments for land, dividend payments for asset shares, etc.), which accounts for 4.2% of family income for employees and is practically zero for farmers. While farmers cultivate all their land and rely primarily on farm production as a source of income, employees willingly lease out some of their land (mainly their land shares) and thus earn extra income from lease payments.

The value of own farm products consumed within the household can be regarded as additional non-cash income: consumption of own farm products replaces cash expenditure on food purchases. The value of own consumption estimated from the survey adds nearly 50% to the cash income of employee families and 20% to that of farmer families. Based on these estimates, the value of own consumption of farm products is 32% of imputed income for employee families and 16% for farmer families. Farm sales remain the dominant component of farmers’ income even after imputing the value of own products, whereas in employee families wages, pensions, and the value of own products are more important than sales (see **figure**).

Structure of imputed income  
(including value of own consumption)



The absolute difference in cash family income is largely an outcome of the difference in farm sizes: 113 ha for farmers, 1.7 ha for employees. Income also increases with family size (the labor pool available for production) and decreases with the age of the family head. The average age of family members has a positive effect on income due to the contribution of pensions that the older family members receive. Income naturally increases with family size and decreases with the age of the family head. The average age of family members has a positive effect on income due to the contribution of pensions that the older family members receive. There is also a certain farm type effect: farmer families earn more than employee families adjusted for land and other factors. Answers relating to the family standard of living confirm the existence of this farm type effect: farmers' families achieve a higher (perceived) well-being than the employee families.

Total cash income, and especially farm income, increase with the increase of farm size. The share of farm income increases from 17% in the smallest farms to more than 70% of total income in the largest. Income per capita also increases with farm size, rising quite dramatically from less than 5,000 hrivny per capita for households with less than 2 hectares to 20,000 hrivny and much more for farms larger than 4 hectares. Family well-being accordingly also increases with the area of land used (or in case of employee families, also with the area of owned land). Families reporting a low level of well-being command significantly less land than families reporting a comfortable level of well-being.

**Peasant farmers earn more than other rural households in absolute terms, they report a substantially higher standard of living, and their family needs are more closely satisfied by their income.** Yet despite the relatively lucrative financial situation the dichotomy of peasant farmers and rural employees appears almost solidly frozen: only 4% of respondents are planning to become peasant farmers within the next 2-3 years. These few are mainly motivated by hopes of a better future for their children, prospects for higher income, and independence. The remaining 96% have no plans to become peasant farmers despite better financial prospects. They are primarily deterred by lack of capital, risk aversion, as well as age and poor health. Concerns about access to inputs and lack of enthusiasm on the part of other family members to continue with farming activities are also cited as obstacles.

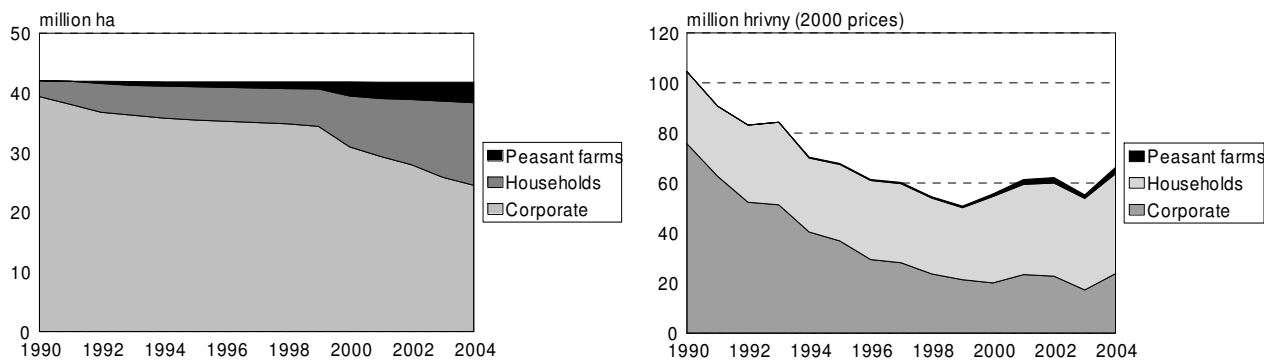
Regardless of the relative success of peasant farming, the survey paints a bleak picture of the future of the Ukrainian village. Around 50% of respondents (both peasant farmers and rural employees) would like to see their children leave the village. Around 15% would like their children to stay in the village but go into business instead of farming. Farming as a future occupation of the children is envisaged by only 24% of peasant farmers and as few as 8% of other rural residents. The Ukrainian village is in the danger of being left without a continuing generation of farmers.

## Conclusions

### 1. The 1999 decree proved to be a true watershed for land ownership and farm holdings in Ukraine

Following the 1999 land reform nearly 7 million rural residents became owners of physical land plots, not just paper shares, and about 65% of arable land is now physically owned by rural individuals. Two-thirds of the rural households surveyed in 2005 received their land shares at least in the form of paper certificates and more than half received them in the form of a physical plot. These share assignment rates are substantially higher than in previous surveys (1994, 1996).

The 1999 decree has dramatically changed the face of Ukrainian agriculture (see **Figure 1**). From agriculture with predominant concentration of production in collective farms it has evolved into agriculture characterized by the clear dominance of individual farms. The individual sector (consisting of the traditional household plots and the independent peasant farms that began to emerge after 1992) controls today more than 40% of agricultural land, contributing 70% of agricultural output. Within the individual sector, the main contribution to agricultural production is from household plots, not peasant farms, as they also control much more land (33% versus 8%).

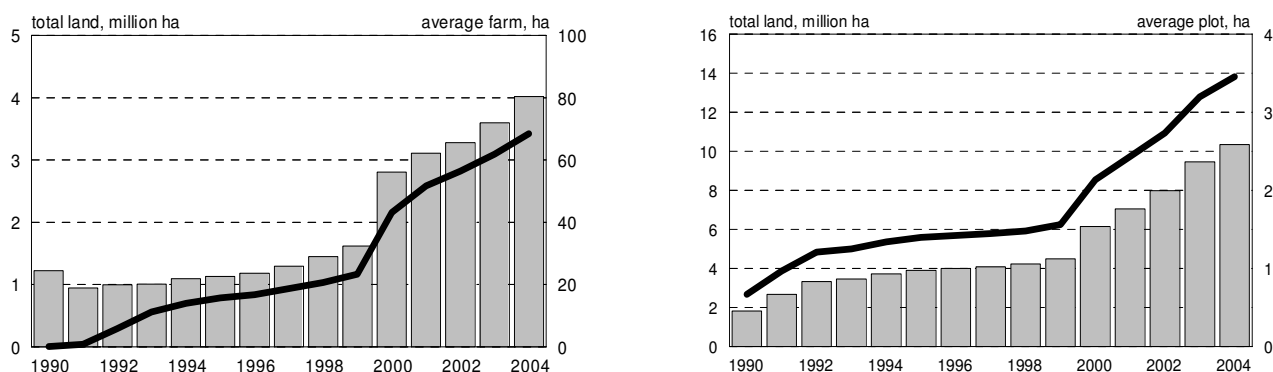


**Figure 1.** Agricultural land (left panel) and gross agricultural product in constant prices (right panel) by farm type in Ukraine, 1990-2004. Source: Statistical yearbooks, various years.

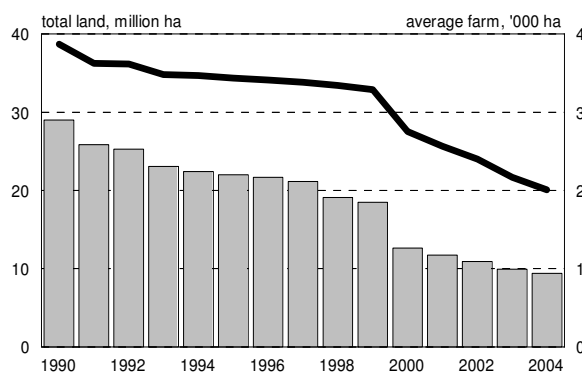
The size of holdings in the individual sector has increased remarkably as a result of the 1999 reform. The average size of a family (peasant) farm increased from 25-30 ha in 1998 to 70-80 ha in 2003-2004. The share of peasant farms in agricultural land doubled from 2-3% in 1995-99 to 6% in 2000 and continued to rise to 8% in 2003-2004. The average size of household plots grew from about 1 hectare in 1998 to 2.5 hectares in 2004 as their share in agricultural land increased from 15% to 35% (**Figure 2**). The substantial increase in total land cultivated in household plots and their average size since 2000 is the direct outcome of the 1999 Presidential Decree, which made it possible for many rural residents to take their land share out of the former collective and use it to augment the traditional household plot (instead of establishing a peasant farm, as originally envisaged).

The increase of landholding in the individual sector has been complemented by a decrease in the landholding in corporate farms as well as an increase in the number of corporate farms. The average size of a corporate farm in Ukraine has fallen from 3,000 ha in 1990 to 2,000 ha in 1998 to 1,000 ha in 2004 (**Figure 3**). Collective agricultural enterprises (CAE), the new

organizational form that dominated the farm structure in Ukraine between 1992 and 1999, completely disappeared after 1999. Corporate farms are now mainly represented by limited liability companies and private lease enterprises (the latter accounting for almost 25% of the total number of corporate farms in Ukraine). While the number of shareholders in corporate farms ranges from 1 to 1,600, fully 16% are single-shareholder entities and 31% have from 1 to 3 shareholders only.



**Figure 2.** Average size (bars) and total agricultural land (curve) in peasant farms (left panel) and in household plots (right panel). Source: Statistical yearbooks, various years.



**Figure 3.** Average size (bars) and total agricultural land (curve) in corporate farms. Source: State Land Committee.

Despite these changes, there remain important differences in the size distribution of farms in Ukraine and in market economies. First, the average size a household farm in Ukraine is much smaller than the average family farm in market economies (130 hectares in land-rich U.S., 20 hectares in EU-15). However, it would be erroneous to conclude that small household farms have little place in market agriculture. In a number of EU countries a significant portion of farmland is in holdings under 5 ha. Considered in this context, the 33% of land area in Ukraine farmed in small holdings does not look extraordinary. Such countries as Greece, Italy, and some of the new EU countries also have a high portion of land in small household farms (**Table 1**).

Second, the average size of a corporate farm in Ukraine (around 1000 ha) is still quite a bit larger than the average size of farms in the EU and the United States (see above). Even non-family corporate farms in land rich United States (about 0.3% of farms using 1.0% of land in

farms) are on average only 533 ha in size.<sup>1</sup> Though there has been an impressive fall in the average size of corporate farms in Ukraine particularly since 1999, there is still some way to go in order that the size of Ukrainian corporate farms be consistent with farm sizes in market economies.

**Table 1. Portion of agricultural land in farms with holdings of less than 5 ha in selected European countries**

Country	Percent of land	Country	Percent of land
EU-15	5.2	New EU members	
Greece	29.2	Romania	38.0
Italy	18.8	Lithuania	30.0
Portugal	13.8	Poland	19.5
Spain	5.5	Latvia	4.0

Source: European Commission Directorate for Agriculture (2004); European Commission (2002a).

## 2. Land policies now differentiate Ukraine from Russia...

Ukraine and Russia pursued similar reform paths until 1999, when Ukraine embarked on its own unique strategy and began to convert paper land shares into physical plots. Because of this strategy, Ukraine today has 40% of agricultural land in individual use compared with only 16% in Russia. The share of individual farms in gross agricultural output (GAO) is also higher in Ukraine: 70% to Russia's 60%. Agricultural employment, on the other hand, has proven much stickier: the share of agricultural labor in Ukraine practically did not change between 1990 and 2003, probably because its larger individual agriculture acts as a "labor sink" for rural residents, offsetting the effect of other factors that tend to reduce agricultural employment (as in Russia; see **Table 2**)

**Table 2. Selected measures of reform outcomes: Ukraine and Russia**

	2003		1990	
	Ukraine	Russia	Ukraine	Russia
Land in individual use, %	38	16	7	2
Share of individual farms in GAO, %	70	60	27	24
Share of agricultural labor, %	23	11	23	15
Share of agriculture in GDP, %	12	5	22	15

Sources: See **Table 5.1** in the main report.

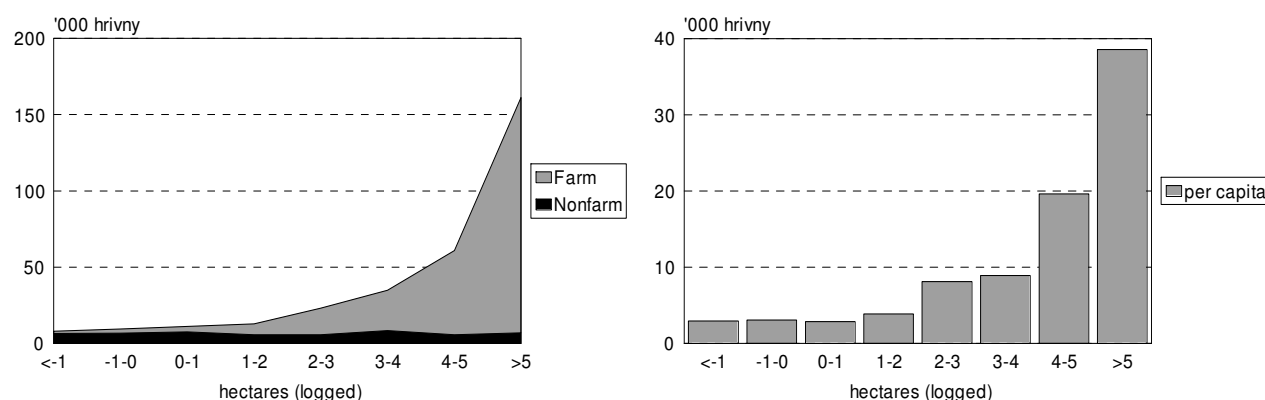
## 3. ...and are important because they are a key factor in determining family incomes and subjective well-being

Family income increases with farm size, and land on its own explains nearly 23% of the variability in cash family income. Data grouped by logged farm size categories show a clear increase of total cash income, and especially farm income, with the increase of farm size (**Figure 4**). The share of farm income increases from 17% in the smallest farms to more than 70% of total income in the largest. Not only total income increases: income per capita also increases with farm size (**Figure 4**), rising quite dramatically from less than 5,000 hryvny per capita for households with 1-2 hectares to 20,000 hryvny and much more for farms larger than 50 hectares. Because of the farm size effect, families of peasant farmers enjoy much higher

<sup>1</sup> U.S. Department of Agriculture, *2002 Census of Agriculture*, USDA/NASS, Washington, DC (2004). [[www.usda.gov/nass](http://www.usda.gov/nass)].



incomes than other rural households (54,500 hrivny for farmers, 9,750 hrivny for employee households).



**Figure 4.** Family income (left panel) and per capita income (right panel) versus farm size for individual farms (households and peasant farms). Farm size is in logged hectares, i.e., -1 stands for 0.4 ha, 0 for 1 ha, 2 for 2.5 ha, 2 for 7 ha, 4 for 55 ha, 5 for 150 ha. Source: FAO Farm Survey, 2005.

The families' perception of well-being was explored through qualitative questions that classified the perceived standard of living into three levels: low, when family income allows nothing beyond food and daily necessities; medium, when family income is sufficient for food, daily necessities, clothing, and other consumption needs; and comfortable, when in addition to the consumption needs the family can afford to purchase durables and in general does not experience material difficulties. Farmers' families achieve a higher (perceived) well-being than the families of other rural households (characterized as employees; **Table 3**). The frequency of respondents reporting a comfortable standard of living is substantially higher among farmers than among employees; and conversely, the frequency of respondents reporting a low standard of living (just sufficient to meet the daily needs) is substantially higher among employee families. This is consistent with the observation that farmer families enjoy higher incomes than employee families. Family well-being, like family income, also increases with the area of land. Households reporting a low level of well-being command significantly less land than households reporting a comfortable level of well-being (**Table 4**).

**Table 3. Perceived well-being among farmers and employees (percent of respondents)**

Level of well-being	Farmers (n=309)	Employees (n=848)
1. Low (not more than food and daily necessities)	<b>28</b>	<b>48</b>
2. Medium (daily necessities, clothing, etc.)	51	44
3. Comfortable (able to purchase durables)	<b>21</b>	<b>8</b>

Source: FAO Farm Survey, 2005.

**Table 4. Standard of living and family income increase with land area used (farm size, ha)\***

Level of well-being	Farmers, ha used	Employees, ha used	Employees, ha owned
1. Low (not more than food and daily necessities)	61	1.45	3.73
2. Medium (daily necessities, clothing, etc.)	106	1.4	4.56
3. Comfortable (able to purchase durables)	326	4.21	4.53

\* Statistically significant differences ( $p = 0.10$ ): 1-3, 2-3 for farmers and employees based on land used; 1-2 for employees based on land owned.

Source: FAO Farm Survey, 2005.

#### 4. There has been a spectacular recovery of agricultural production after 2000, primarily due to growth in individual farms

Overall, the agricultural output from both individual and corporate farms made a spectacular recovery since 1999, growing by 30% in constant prices (Figure 5, thin black curve). The decline in 2003 was a temporary setback associated with severe drought.

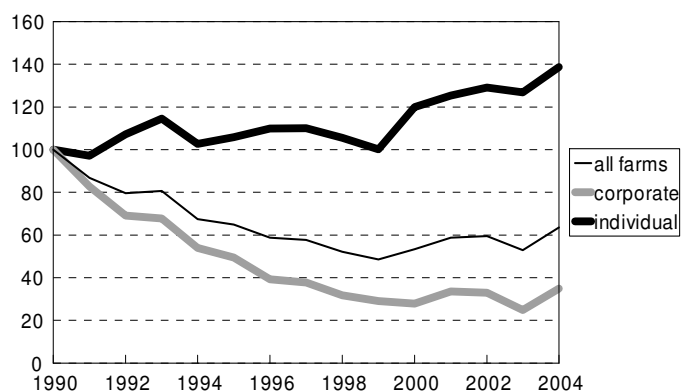


Figure 5. Gross agricultural product (GAO) by farm type 1990-2004 (in percent of 1990).  
Source: Agricultural statistical yearbooks, various years.

GAO in the individual sector grew by 45% during this period, whereas the corporate farm sector grew by only 11% from 1999 to 2004 (Figure 5, thick curves). Although the post-1999 reforms have had a particularly beneficial effect on the performance of individual farms, they also have had some impact in the corporate sector. The decline in output of corporate farms stopped in 2000 and the number of unprofitable corporate farms dropped from almost 100% in 1997-99 to around 40% in 2000-2004 (although the absolute losses continued to climb). Many interpreted the sudden improvement in farm performance as a result of the turnaround in government policies. Some believed that an important page had been turned in agricultural policy that would allow development of agriculture and rural areas to go forward.

#### 5. The move toward private farming has brought many features of normal market-oriented agriculture to Ukraine

*a. The portion of the rural population connected to the corporate farm in Ukrainian rural areas has fallen considerably.*

The reforms following the 1999 decree have brought a dramatic change in the employment structure of the rural population. In 1996, 67% of the adult population (in the ages between 18 and 60) worked in the local farm enterprise. In 2005, only 21% of the adults report that their main employment is with the corporate farm. When heads of households were asked to characterize their relations with the former collective fully two-thirds of respondents reported no relations with the corporate farm. One-third work on the corporate farm or are (passive) shareholders (Table 5). These findings are consistent with the prevailing opinion among Ukrainian scholars and officials that “only one-third of the able-bodied rural population work in corporate farms.”

**Table 5. Relations of heads of households with the local corporate farm**

	% of respondents
No relations with corporate farm	68
Permanently employed by corporate farm	17
Temporary employment by corporate farm	5
Shareholder of corporate farm	10
Total	100

Source: FAO Farm Survey, 2005.

*b. Household plots and corporate farms are more and more connected by paid service relations*

The support for the household plot is no longer free, however. Survey estimates indicate that farm managers spend 57,000 hryvny per enterprise per year on household plot support. Of this amount, 76%, is reimbursed by the household (generally in the form of labor input or farm products) and the net cost to the farm enterprise is only 24% of the total. This net amount equals about 0.5% of the total annual expenditure of the average farm. Since there are around 700 households per farm enterprise in the survey, the net cost per household is a mere 20 hryvny per year.

**Table 6. Services provided by farm enterprises to the rural population: responses of farm managers, household members, and peasant farmers (percent of respondents)**

	Managers*	Household members	Peasant farmers
Assistance with plot cultivation	94	47	23
Transport	53	18	10
Feed, seeds	35	20	5
Veterinary services	22	22	5
Machinery maintenance and repairs	15	10	10
Fuel	7	9	8
Fertilizers, plant-protection chemicals	6	15	6
Assistance with sale of farm products	8	8	3

\*Percent of those who report providing services to the rural population (84% of the full sample).

Source: FAO Farm Survey, 2005.

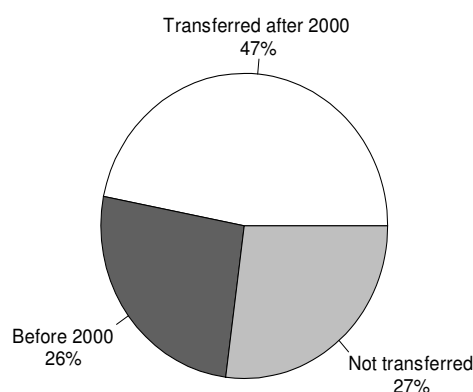
**Table 6** presents an inventory of services provided by farm enterprises to the rural population. The first column is based on the responses of corporate farm managers; the other two columns are based on the responses of heads of rural households and peasant farmers. Assistance with household plot cultivation and provision of transport services are the two most important items according to farm managers.

*c. Most social services have now been transferred to local governments*

During the Soviet era, large farm enterprises were directly entrusted with maintaining the entire range of social services in the village. The farm enterprise took over the functions normally fulfilled by local government, building roads, supplying water, gas, and electricity, and providing housing. It traditionally provided access to a comprehensive range of services and benefits for its members and employees, and also for other rural workers, including teachers, doctors, postal employees, etc., who in fact were on state payroll and not employed directly by the farm. These social services ranged from daily necessities, such as house maintenance and repairs, heating fuel, or various goods at subsidized prices, to culture and recreation, such as clubs and sports facilities. School buildings, clinics, shops, and other public facilities in the village were maintained and often built by the farm enterprise, with or

without reimbursement from the government. The budget for all these benefits and services came from the operating revenues of the farm enterprise, and the farms in effect combined production functions with overall responsibility for social services in the rural areas.

The reform agenda attempted to focus the large-scale farms on business and profits, which necessitated relinquishing their responsibility for rural social services. As part of their reorganization, farm enterprises were required to shed their social assets and transfer the responsibility for the social service infrastructure to the local councils. Initially, this process moved very slowly and haltingly, because the government failed to provide the local councils with the requisite budgets. As late as 1998, a World Bank study found that reorganized farm enterprises continued to provide a wide range of social services and benefits to the rural population. The situation seems to have changed quite radically since 2000. Fully 73% of farm managers surveyed in 2005 reported that their social assets had been transferred to the local municipality. Of these, only 26% of farm enterprises had transferred their social assets prior to 2000; the remaining 47% transferred the social assets more recently (**Figure 6**).



**Figure 6.** Transfer of social assets from corporate farms to the local council (percent of respondents). Source: FAO Farm Survey, 2005.

The social assets were universally transferred to the local municipality or the state free of charge. Among the 27% of farm managers who did not transfer their assets, one-third claim that the municipality has no budget and thus cannot accept the responsibility, while the remaining two-thirds regard the free transfer of social assets as an economically unacceptable option and prefer to continue maintaining the social infrastructure themselves.

*d. Agricultural inputs are widely available and utilized for all types of farms...*

Purchased inputs, machinery, land, and credit are the four main factors of production for farms everywhere. Purchased inputs such as fertilizer and plant protection agents are now largely purchased through commercial suppliers in Ukraine both by corporate and peasant farms. Farm machinery services are widely available either through ownership or through leasing services. Land leasing is also widely employed for redistributing land from households to large corporate and peasant farms. Commercial credit is also now widely available and utilized by farms.

**Purchased inputs**

Private trade – commercial suppliers and private individuals – are the main channel for farm inputs among managers and peasant farmers alike (**Table 7**). State suppliers continue to play

an important role, but they are now far behind the commercial trade channels. Moreover, the role of state suppliers has declined dramatically over time: in the 1996 World Bank survey 60% of peasant farmers reported purchasing inputs through state-owned channels, compared with around 15% in 2005. The reliance on private trade is particularly pronounced for the group of 8 high-priority inputs. Peasant farms tend to rely more than corporate farms on purchase of inputs from other farms. In general, other farms are a significant source of three kinds of inputs: seeds and seedlings, young animals, and mechanized field works (“custom farming”). This is true for both corporate farms and peasant farms. In addition, peasant farms rely heavily on other farms for the purchase of machinery and equipment, often second-hand.

**Table 7. Supply channels for farm inputs: corporate farm managers and peasant farmers (percent of respondents)\***

	All inputs (15)		High priority inputs (8)	
	Managers	Farmers	Managers	Farmers
State suppliers	16	14	18	15
Commercial suppliers	44	36	58	50
Private individuals	8	13	10	17
Own production	4	3	4	3
Other farms	5	7	6	9
Other sources	1	1	1	2

\* Frequency scores averaged over inputs for respondents reporting that they need the specific input (in percent). Multiple answers allowed for each input.  
Source: FAO Farm Survey, 2005.

**Table 8** demonstrates the changing roles of state and commercial suppliers during the last decade. The responses of both corporate farm managers and peasant farmers in two surveys separated by more than 10 years – the 1994 World Bank survey and the 2005 FAO survey – reveal a sharp decrease in the importance of state supply channels and a sharp rise in the importance of commercial suppliers. The reliance on other corporate farms as a source of inputs also declined dramatically over time. In 1994, the state and corporate farms dominated the markets for farm inputs in Ukraine; by 2005 the private commercial sector had captured the leading role among supply channels.

**Table 8. Changing role of main supply channels: 1994 and 2005 (percent of respondents)**

	Managers		Farmers	
	1994 WB survey	2005 FAO survey	1994 WB survey	2005 FAO survey
<i>All inputs (15)</i>				
State channels	45	16	42	14
Commercial suppliers	7	44	14	36
Other farms	49	5	22	7
<i>High priority inputs (8)</i>				
State channels	65	18	61	15
Commercial suppliers	7	58	19	50
Other farms	56	6	29	9

Source: FAO Farm Survey, 2005.

Access to purchased inputs was explored in more detail in the survey by asking the respondents – both managers and peasant farmers – to indicate if they were actually buying all that they needed in a list of 15 specific inputs. About 20% of respondents in both categories cannot buy the inputs that they need. When the answers are restricted to high-priority inputs (these are inputs identified as needed by more than 50% of respondents), the percentage of respondents who cannot buy what they need drops to 12-15%.

## Farm machinery services

Availability of farm machinery is reported with fairly high frequency among all farm types (**Table 9**). Availability among corporate farms is practically universal; peasant farms are not far behind; and even among household plots 70% report some machinery and around 50% report tractors or light machinery (such as plows, tillers, and seeders). Vehicles, and especially trucks, are comparatively less accessible to household plots and peasant farms.

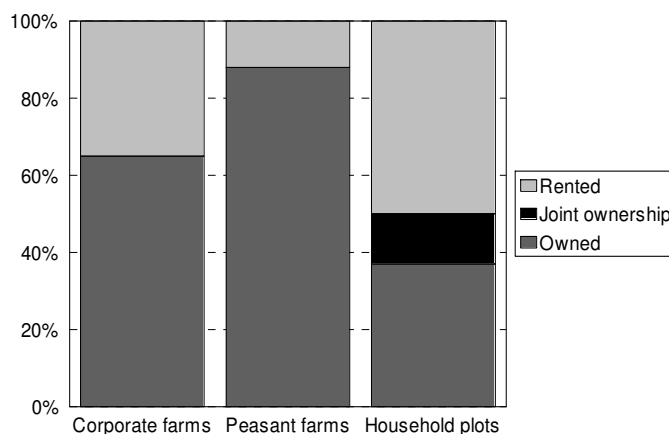
**Table 9. Availability of farm machinery (percent of respondents reporting machinery)**

	Corporate farms	Peasant farms	Household plots
Any farm machinery	95	89	70
Heavy machinery	94	85	49
Light machinery	92	83	57
Vehicles	91	52	19

Note: Heavy machinery – tractors, harvester, combines; light machinery – plows, tillers, seeders, trailers, etc.; vehicles – trucks, cars.

Source: FAO Farm Survey, 2005.

Corporate and peasant farms use primarily own machinery, which is supplemented with some rental equipment (**Figure 7**). Most of the rented equipment originates from private sources: access to state leasing programs is virtually nonexistent in the survey. Contrary to peasant farms, household plot operators show a very high willingness to rent or share equipment with others. Own farm machinery accounts for only 37% of the total machine count among household plots, and fully 50% is rented for farm use as needed. These findings provide a definite indication of the existence of machinery rental markets, which clearly act to alleviate machinery constraints among farms of all types.



**Figure 7.** Sources of machinery by farm type (percent of respondents for corporate and peasant farms; percent of machinery units reported for household plots). Source: FAO Farm Survey, 2005.

## Land leasing

Land leasing is widespread among farms of all types in Ukraine. In **household plots** the land used for farming is just 36% of the family's total land holdings and the rest is leased out.

**Peasant farmers**, unlike household plot operators, use all the available land and do not lease anything out. On the contrary, they lease in to augment their owned land. Of the 140 hectares in an average peasant farm, only 18% is owned land, while the remaining 82% is leased from other landowners or from the state. For comparison, the land used for farming in household plots (2.8 hectares on average) is 98% owned (**Table 10**). Corporate farms, unlike peasant

farms and household plots, have very little own land and they rely primarily on land leased from individuals (members, shareholders, and other rural landowners).

**Table 10. Sources of land used in peasant farms and household plots**

	Ave plot size, ha	Total, %	Owned land, %	Leased land, %
Peasant farm	144	100	18	82
Household plot	2.8	100	98	2

Source: FAO Farm Survey, 2005.

**Peasant farmers** rely on land leasing markets to increase the size of their farms. More than half the peasant farmers surveyed lease in land, and the average size of these “lessee farms” is much larger than the size of farms without leased land (**Table 11**). Growth in farm size is entirely attributable to the leased component: one hectare of additional leased land produces a one hectare increase in farm size.

**Table 11. Effect of leasing on farm size**

	Percent of respondents	Farm size, ha
Farms with leased land	53	227*
Farms without leased land	47	53*
All sample	100	144

\* Difference significant by t-test (p=0.000).

Source: FAO Farm Survey, 2005.

In **corporate farms** most land is leased, and land owned by the corporate farm as a legal entity is less than 7% of the total of 1,711 hectares. Land is primarily leased from shareholders and other private individuals, who account for almost 90% of the land leased by corporate farms. (**Table 12**). Only a small minority of the shareholders and other lessors actually work in the corporate farm: most shareholders and lessors appear to be passive landowners who entrust their land to the corporate farm without demanding in return the security of a wage job on the farm.

**Table 12. Structure of sources of leased land for corporate farms**

Source	Percent of leased land	
Members (shareholders)	42	
Of which: work in the corporate farm	16	
Other private individuals	47	
Of which: work in the corporate farm	8	
State, municipality, regional government	6	
Other sources	5	
Total leased land	100	

Source: FAO Farm Survey, 2005.

While the participation rates in land lease markets are quite high, the market for buying and selling of land is still hopelessly undeveloped: nobody in the survey reported selling land and only 5% of peasant farmers reported buying land in the last 5 years.

## Commercial credit

Both corporate and peasant farms have a perception of significant access to credit. Fully 63% of corporate farm managers and 34% of peasant farmers report that they actually borrow (rural households borrow much less frequently – only 15% of respondents). In relation to respondents reporting that they need credit (**Table 13**), these numbers indicate that 71% of corporate farms and 42% of peasant farms that need credit in fact manage to borrow

(at least partially). Corporate farms apparently enjoy better access to credit than peasant farms. This conclusion is strengthened by the observation that among peasant farmers 45% need credit, but cannot borrow, while the corresponding percentage among corporate farms is 26%.

**Table 13. Perceived credit situation**

	Farmers, %	Managers, %
Do not need credit	19	11
Borrow all that is needed	24	38
Borrow less than needed because of restrictions	10	25
Need credit, but cannot borrow	45	26

Source: FAO Farm Survey, 2005.

Access to credit has improved over time. Managers of corporate farms indicated that the credit situation today was better than before 2000, while among peasant farmers the percentage of respondents who could not borrow all that they needed dropped from 90% in 1994 to 55% in 2005. The percentage of peasant farmers using credit steadily increased from 15% in 1992 to 20% in 1994 and now to 33% in 2005. The respondents' view of improved access to credit was confirmed in separate interviews with regional officials.

Banks and input suppliers are the main sources of credit for both corporate and peasant farms. Commodity credit or credit in kind plays a marginal role in the survey, while wage arrears or debt for taxes and social deductions do not appear to be a problem. The state has practically disappeared as a source of credit for peasant farms. Formal credit is gradually replacing informal borrowing from relatives and others in the individual sector.

Agricultural producers typically borrow for 12 months at annual interest rates of around 19%. Given inflation rates of around 9% in 2004, the real cost of agricultural borrowing in Ukraine is 9-10% annually, which is quite high by world standards. The respondents generally complained that the interest rates were too high and the credit term too short: an acceptable interest rate for future borrowing would be 8% with credit term of 3 to 4 years. These acceptable interest rates are equivalent to zero (or even negative) real interest, which is not attainable economically.

Borrowing from the banks naturally requires collateral, which most corporate and peasant farms manage to provide. Lack or insufficiency of collateral was perceived as one of the three main obstacles to borrowing (after high interest rates and short credit term).

Contrary to the situation in the past, the level of indebtedness is not particularly high: the average farm debt can be paid off with 6-7 months of sales revenue. For corporate farms, the situation in 2005 appears to be a significant improvement compared with 1998, when debt-to-sales ratios were around 2 years and farm indebtedness was a major concern. Farm profitability has also improved significantly since 1998, but farms with debt still have lower levels of profitability than farms without debt.



## 5. Despite many positive changes, Ukraine still faces appreciable challenges

### a. Families in rural areas have little non-farm income

It is widely recognized that a key factor for ensuring higher well-being for rural families in developing and developed countries is increasing household participation in off-farm employment. For instance, an average farm in the United States from 1999 to 2003 earned 85-95% of its income from off-farm sources, up from 50% in 1960. Even the largest U.S. farms (with sales over \$500,000 per year) earned only 80% of income from farming activities in this period.<sup>2</sup>

**Table 14. Structure of family cash income (in percent)\***

	Farmers	Employees
Sales of farm products	87	31
Sale of services	2	2
Non-farm income (business and property)	0	4
Salaries	7	41
Social transfers	3	21
Remittances from relatives	0	1
Sale of assets	1	0
Other	0	0
Total income	100	100
Hrivny	54,500	9,750
Per capita income, hrivny	15,300	3,100
Land used, ha	113	1.7

\*Based on weighted average amounts by sources of income.

Source: FAO Farm Survey, 2005.

In Ukraine, on the other hand, rural households – families of both peasant farmers and rural employees – earn very little income from off-farm sources. **Table 14** shows that peasant farmers and farm employees receive only 13% and 28% of household cash income from non-farm sources.

Commercial farms in Ukraine – both corporate and peasant farms – mainly concentrate on primary agriculture (crops, livestock, orchards and vineyards), with relatively little diversification into non-agricultural activities (**Table 15**). This is especially true of peasant farms, where only 13% report any non-agricultural activities. Non-agricultural activities are almost always in addition to primary agriculture. **The paucity of off-farm employment opportunities in rural areas is perhaps the greatest hindrance to raising rural incomes.**

**Table 15. Diversification between agricultural and non-agricultural activities (percent of farms)**

	Corporate farms	Peasant farms
Only agricultural activities	74	87
One non-agricultural activity	15	11
Two non-agricultural activities	6	1
More than two non-agricultural activities	5	1

Source: FAO Farm Survey, 2005.

<sup>2</sup> U.S. Department of Agriculture, Economic Research Service, *Economic Well-Being of Farm Households*, Economic Brief Number 7 (2006). Off-farm income includes employment earnings, other business activities, investments, and transfer payments.

*b. Ukrainian producers have significant problems of competitiveness compared with agriculture in the new EU countries*

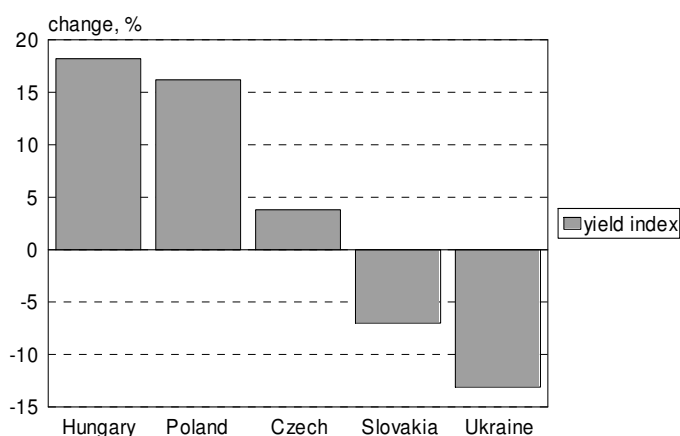
**Crop yields in Ukraine lag significantly behind those in the countries of the European Union.** Agricultural performance in Ukraine as measured by physical crop and livestock yields is generally worse than in the countries of the European Union. Ukrainian yields range between 20% and 70% of those of the EU-15 countries (**Table 16**). Ukrainian yields are also low compared to the new EU members (Poland, Czech Republic, Slovakia, and Hungary). Ukrainian yields are lower than the yields in these countries for each crop indicated in **Table 16** except grapes. Ukraine lags behind the new EU members also in growth of yields between 1992-94 and 2001-03 (**Figure 8**).

**Table 16. Yields in Ukraine compared with EU-15**

Crop	Ukrainian yields in percent of EU-15 yields (EU-15=100*)	Rank relative to new EU members** (5=bottom)
Barley	49	5
Cereals, total	45	5
Coarse grain, total	42	5
Grapes	61	4
Maize	40	5
Potatoes	31	5
Sugar beets	33	5
Sunflower seed	67	5
Tomatoes	19	5
Wheat	46	5

\*EU-15 yields are averages for 2001-03. \*\* Includes Hungary, Poland, Czech Republic, and Slovakia.

Source: FAOSTAT (2006).



**Figure 8.** Changes in crop yield index in the new EU members and Ukraine between the average for 1992-94 and the average for 2001-03 (percent). The yield index is a weighted average of the yields for five major crops – cereals, sunflower seeds, other oil crops, potatoes, and vegetables. Source: FAOSTAT (2006).

**Three-fifths of agricultural land is still in corporate farms, which have significantly lower land productivity than household farms.**

Yields expressed in physical units of output per physical unit of (a single) input, such as land, provide the most basic and yet the crudest measure of productivity. The detailed picture with crop yields is not particularly clear, because we are dealing with a wide range of commodities. To bring out the general patterns, **Table 17** summarizes the pairwise yield comparisons across a wide range of different crops for the three farms types covered by the

survey. Judging overall (“by majority”), household plots seem to be doing better than both corporate and peasant farms in crop production. In 6 out of 10 (or respectively 11) cases household plots achieve higher yields than corporate or peasant farms. In 3 more cases in either comparison category the differences in yields are not statistically significant. The yields achieved by household plots are lower only in 1 case compared with corporate farms and 2 cases compared with peasant farms. The picture between farmers and enterprises, on the other hand, is very mixed. It seems that corporate and peasant farms overall achieve comparable crop yields.

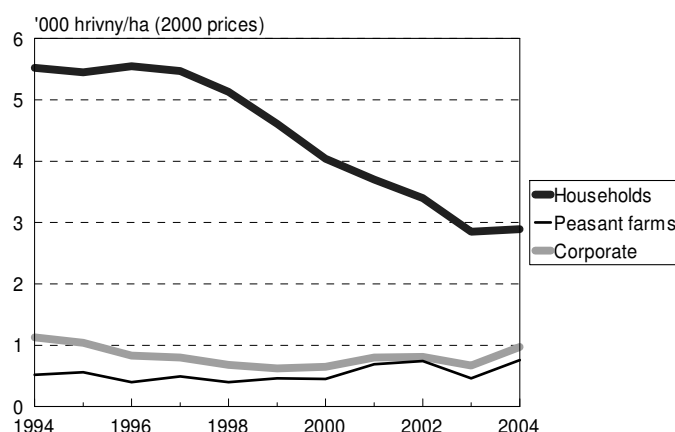
**Table 17. Summary of pairwise comparisons of crop yields for farms of different types**

	Corporate and peasant farms	Household plots and peasant farms	Household plots and corporate farms
Higher yields in hh plots	3	6	6
Lower yields in hh plots	3	2	1
No significant difference	8	3	3

Source: FAO Farm Survey, 2005.

Intuitively, one would expect the large corporate farms and commercial farmers to have an advantage in scale crops, such as cereals, while household plots are usually hypothesized to have a yield advantage in horticultural crops (potatoes and vegetables). This is definitely not the situation that we observe in the survey. Household plots achieve outstanding results in wheat and barley, significantly better than corporate or peasant farms. On the other hand, household plots seem to lose their advantage in crops that are grown practically by everyone. Thus, potatoes and vegetables are produced by 85-95% of household plots in the survey, compared with 20% among corporate farms and 50% among peasant farms. We may speculate that when a relatively small number of respondents choose to produce a particular commodity (e.g., cereals among household plots, horticultural crops among corporate and peasant farms), a positive selection effect ensures that these producers achieve higher yields.

In livestock production, milk yields (in kg per cow per year) reported in the 2005 FAO survey are significantly lower for corporate farms than for individual farms (2,600 kg per cow per year for corporate farms compared with 3,700 kg for peasant farms and household plots combined; the differences in milk yields within the individual sector are not statistically significant).



**Figure 9.** Partial productivity of land by farm type 1994-2004 (in constant prices). Source: Agricultural yearbooks, 2002-2004.

**Figure 9** shows the partial productivity of land for the period 1994-2004 for corporate farms, peasant farms and household farms. The partial productivity of land is calculated as the ratio of the value of production (in constant prices) to land used. Although the land productivity of household farms decreased over time as they acquired more land (a decreasing returns to scale effect), it remained consistently higher than the land productivity of corporate and peasant farms. The gap between the two series is very substantial: the mean productivity for household plots for the period 1994-2004 is around 4,000 hrivny/ha, whereas the mean productivity for corporate farms and peasant farms is less than 1,000 hrivny/ha. It is interesting to note that the land productivity of peasant farms taken on their own is much lower than the productivity of household plots – the other component of the individual sector. It is even lower than the productivity of corporate farms, although we observe definite convergence between corporate and peasant farms during this period, as land productivity of peasant farms rises from 60% of the productivity of corporate in 1994-1999 to over 80% in 2000-2004. The newly created peasant farms presumably need time to adapt to external conditions and start performing on a par with other farm types. A similar comparative pattern is observed in Russia, where household plots are more productive than either corporate or peasant farms, whereas the latter two farm types are often statistically indistinguishable by their productivity results.<sup>3</sup>

### **Profitability of corporate farms has improved, but many are still unprofitable.**

Corporate farms participating in the survey provided profit and loss information based on annual financial reports. Given the partial response of the respondents to financial questions, profit analysis could be conducted for at most 142 out of 208 farms surveyed. Of these, 70% are profitable (positive gross profit) and 30% are loss-makers. This constitutes a dramatic improvement compared with the situation in 1997, when 84% of farms surveyed reported losses (1998 World Bank survey). The increase in the frequency of profitable farms was accompanied by a marked increase in profitability levels (**Table 18**). The overall profit margin in the sample (the ratio of gross profit to sales) increased from a loss of -24% in 1997 to a profit of +12% in 2005. The profit margin of the profitable farms as a subgroup rose from 11% in 1997 to 25% in 2005.

**Table 18. Profitability of corporate farms in 2005 compared with 1997**

	Percent of farms		Profit margin, % of sales	
	2005	1997	2005	1997
All farms	100	100	+12	-24
Farms reporting profits	70	16	+25	+11
Farms reporting losses	30	84	-21	-39

Source: FAO Farm Survey, 2005; World Bank Survey, 1997.

There does not seem to be any relationship between profitability and the reorganization mode or reorganization time of the corporate farms. The ratio of 70% profitable farms to 30% loss-makers observed in the entire sample persists both among the new reorganized structures (i.e., farms created as new organizations or through the splitting of former collectives) and the legacy structures (i.e., farms that are one-to-one successors of former collectives). The same ratio is also obtained for corporate farms created before and after 1999. The “new wave” farms are thus not doing any better than their older counterparts, and the improved profitability is a general feature of the economic system. Nor is there a relationship between

<sup>3</sup> These results for Russia emerge from a recent BASIS/CRSP study using a 2003 survey of farms of different organizational forms. The corresponding findings are forthcoming in G. Brock, M. Grazhdaninova, Z. Lerman, and V. Uzun, “Technical Efficiency in Russian Agriculture.”

profitability and farm size: although the average size for the group of profitable farms is somewhat larger than for the loss-makers (2,000 hectares compared with 1,700 hectares), the difference is not statistically significant ( $p = 0.25$ ).

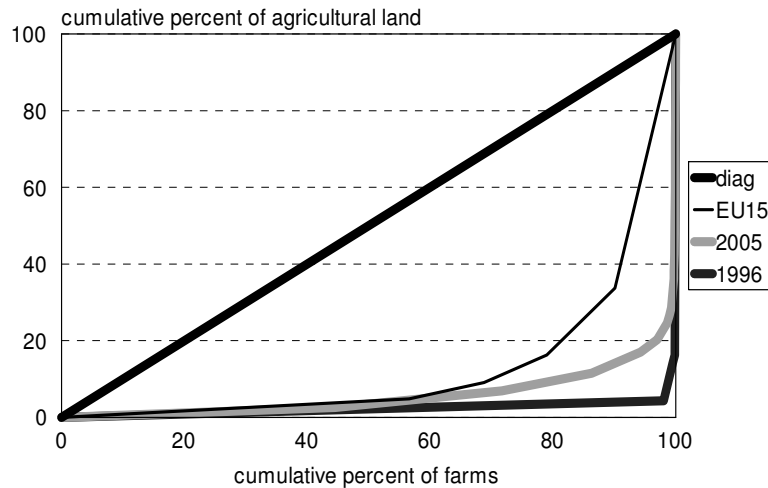
*c. There is still a strong duality of farm structure in Ukraine. Though the duality is not as severe as in Soviet times, the lack of mid-sized farms is an obstacle to the development of internationally competitive agriculture.*

Large gaps in size between farms of different types are still observed in Ukraine: the mean size in the 2005 survey is 1,700 hectares for corporate farms, 140 hectares for peasant farms, and 1.7 hectares for household plots. The corporate farms, although shrinking rapidly, are still much larger than in market economies (500-600 hectares per corporate farm in the U.S.), while the household plots, although definitely growing, are still much smaller than the average family farm in market economies (130 hectares in land-rich U.S., 20 hectares in EU-15). The size gaps perpetuate the strong duality of farm structure that characterized Soviet agriculture and create a farm size distribution that is neither reasonable nor effective by the benchmark of market agriculture.

The 1999 decree was instrumental in decreasing the duality of land holding in Ukraine, primarily through adding land to small holding agriculture and increasing the portion of total land they farm. Figure 10 illustrates the degree of inequality in the size distribution of agricultural land in the EU-15 and Ukraine in 1996 and 2005. In this figure the horizontal axis indicates the cumulative percent of farms, the vertical axis the cumulative percent of land. The diagonal line illustrates a situation of complete equality in which each farm occupies an identical portion of total land. Along the diagonal 10 percent of farms occupy 10 percent of agricultural land, 20 percent of farms occupy 20 percent of land, and so on. Inequality in the distribution of farm land is shown by the bowing out of the curve. The most severely bowed out line (Ukraine, 1996) illustrates a situation where about 97 percent of farms hold only 5 percent of land and 3 percent of farms hold 95 percent of land.

**Figure 10** illustrates the profound changes in land concentration in Ukraine between 1996 and 2006 due to the 1999 decree. By 2005, 90% of farms held 15% percent of land (up from 2% in 1996), while 3% percent of largest farms held 40% of land (down from 96% in 1996). Agricultural land holdings shifted significantly from large to small farms between 1996 and 2005. The distribution of land holding in Ukraine in 2005, however, is still far from the distribution in the EU-15, which represents distribution of land in market economies. In the EU-15, 90% of farms held 33% of land (compared to 15% in Ukraine in 2005), while 3% of largest farms held about 10% of land (compared to 40% in Ukraine). This is a far more equitable distribution of land than in Ukraine, even in 2005.

The reason why the size distribution of land is so important is that experience of market economies has shown that the most viable farms in market circumstances are neither the small household farms under 5 ha, nor the large corporate farms of 1,000 ha or more. The most viable farms in a market environment are mid-sized farms of between 15 ha and 300 ha. The average size of a farm in the EU-15 is around 20 ha, while in the United States the average size is 130 ha. Ukraine lacks a large contingent of mid-sized farms, precisely the kind of farms that market agriculture has shown are competitive in world markets.



**Figure 10.** Distribution of agricultural land in farm holdings in Ukraine and EU-15. Sources: 1996 from statistical yearbooks; 2005 from FAO survey data adjusted to national proportions; EU-15 from *Agriculture in the European Union*, European Commission, Brussels (2005).

*d. Still, a bleak picture for the future of the Ukrainian village...*

Regardless of the relative success of peasant farming, the survey paints a bleak picture of the future of the Ukrainian village. Around 50% of respondents (both peasant farmers and rural employees) would like to see their children leave the village. Around 15% would like their children to stay in the village but go into business instead of farming. Farming as a future occupation of the children is envisaged by only 24% of peasant farmers and as few as 8% of other rural residents. The Ukrainian village is in the danger of being left without a continuing generation of farmers.

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