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The Economics of Land Consolidation in Family Farms of Moldova*

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Abstract

The paper investigates the current situation with fragmentation of family farms in Moldova and its effects on family well-being and farm productivity. A key hypothesis is that consolidation of agricultural land in Moldova has beneficial effects in terms of productivity and is desirable in the long run.

We examine the case for market-driven land consolidation using data from several recent surveys in Moldova. We show that, in the individual sector, larger farms consume less of their output and attain higher levels of commercialization. Larger individual farms thus have higher revenues from commercial sales and generate higher family incomes. Farm augmentation accordingly makes a positive contribution to the well-being of the rural population. The extent of parcel consolidation is directly correlated with the relative efficiency of farms: consolidated family farms are more efficient than those with fragmented holdings. Hence, land consolidation leads to better economic performance of family farms.

Keywords

Land consolidation, land fragmentation, land market, family farms, rural incomes, Moldova

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1 BACKGROUND

Despite an early start, the process of land reform in Moldova was not visible until 1996. Authorities had no sufficient political will for restructuring of old legal entities and privatization of their land to rural residents; the reform efforts stalled due to the unwillingness of the managers of former collective farms to cooperate with the government. Therefore, during the initial period land reform in Moldova saw only minimum changes and agriculture largely retained the Soviet heritage. Nevertheless, most of the rural residents received during this period paper certificates attesting to ownership of a certain land share, but in an unspecified location.

In 1996, the constitutional court removed some legislative constraints on land reform, providing an impetus for fundamental changes in the organization of the agricultural sector. A significant shift started to be felt a year later, when the National Land Program (NLP) was launched. In March 1998, the NLP was unrolled on a national scale triggering the privatization of all existing collective farms and sweeping conversion of the paper certificates to physical plots. Agricultural land in state ownership dropped from 100% in 1990 to less than 25% in 2005. As of the end of 2005, over 670,000 holders of land shares, or about two-thirds of all beneficiaries, had withdrawn nearly 900,000 hectares of agricultural land from large-scale collectives for individual use (Lerman, Cimpoies, 2006).

Each landowner who exercised his rights under the NLP received on average 1.3-1.4 hectares of agricultural land. Combined with the original household plot of 0.3-0.4 hectares, the NLP distribution produced small holdings of less than 2 hectares. The small farm sizes produced in the process of land reform are one dimension of land fragmentation in Moldova.

Size fragmentation was exacerbated by the equity-driven design of land privatization in Moldova. To ensure that all peasants had equal access to land of different types, each land share was divided into three separate parts: a share of arable land, a share of orchards, and a share of vineyards. In practice, many landowners received more than three parcels against their land shares. In a 2003 survey of peasant farms, 55% reported 3-6 parcels and 19% reported more than 6 parcels (Muravschi, Bucatca, 2005). The inherently small holdings were thus further fragmented into still smaller parcels in scattered locations. The splitting of small land holdings into multiple parcels is the second dimension of land fragmentation in Moldova.

Less than half the landowners who received physical plots through the NLP decided to farm their land independently (DSS, 2004a), creating the new category of independent peasant farmers that did not exist prior to reform. Others leased their land to so-called “leaders” or “managers”, who founded new corporate farms by consolidating the dispersed small plots of passive landowners. At present, these “leaders” manage about 1,500 farms – limited liability companies, joint stock companies and agricultural production cooperatives – with an average size of 500-800 hectares depending on organizational form.

The distribution of land to the rural population led to dramatic changes in the structure of land use by farms of various organizational forms. Particularly notable is the shrinking share of former state and collective farms and a corresponding increase in land used by the individual sector. Thus, in 1990, less than 10% of the total of agricultural land was operated by the individual sector. Since then, the picture has significantly changed: the two sectors of corporate and individual farms each control about 50% of agricultural land. The traditional collective farms practically disappeared during the last decade, as many of them were privatized or liquidated and others registered in new legal forms.

While corporate farms average 500-800 hectares, the individual farms (household plots and peasant farms) are much smaller. Thus, the average peasant farm has 1.8 hectares and only 277 peasant farms (out of over 350,000 in total) are larger than 50 hectares (DSS, 2004b). Half the agricultural land in Moldova is in units smaller than 10 hectares (WORLD BANK, 2005). This category comprises over 1 million household plots and small peasant farms with average holdings of 0.8 hectares. The small average size and the huge number of small farming units in a population of less than 4 million clearly demonstrate the extent of fragmentation produced by land reform in Moldova.

The creation of so-called "peasant farms" was one of the main objectives of land reform, and this objective has been fully achieved. However, the small size of the peasant farms, whose holdings are furthermore split into several disjointed parcels, raises considerable concerns about their long-term viability and has led to an intense public debate regarding the impacts of fragmentation.

In this paper we examine how the two dimensions of fragmentation – small farm sizes and large number of parcels per farm – affect farm productivity and family incomes. We also review the development of land markets in Moldova, as buy-and-sell transactions and land leasing provide obvious mechanisms for market-driven consolidation of fragmented holdings. The analysis relies on several farm and household surveys conducted between 2003 and 2008. These surveys are shown at the beginning of the list of references. The latest in the series of surveys (referred to as the 2008 ASM survey in what follows) was conducted in July 2008 covering about 600 households and peasant farms from four villages spread across the country and about 80 corporate farms from 30 districts. Financing was provided by the Academy of Sciences of Moldova under the state project "Developing of economic mechanisms of land consolidation"

The paper is organized as follows: we start by presenting the survey evidence regarding the positive impact of consolidation on farm efficiency and rural well-being. We then proceed to describe the development of land market transactions based on survey data. A separate section describes the formal land consolidation effort in Moldova and presents some preliminary results of the 2008 land consolidation pilot project. Some concluding remarks are given at the end.

2 FARM TYPES AND FARM SIZES IN MOLDOVA

There is a voluminous literature dealing with the effect of farm sizes on efficiency and productivity in market economies and in transition countries. At the outset of transition some argued for the necessity of preserving large farm structures and preventing farm fragmentation on the basis that smaller farms were less efficient (Kanchev, Doichinova, 2000). In contrast, others argued that large farms in former socialist countries in Europe suffered from diseconomies of size and land reform strategies had to include proposals for reducing the mean farm size (Koester, Striewe, 1999). So far, the results are indecisive: there is no evidence that large farms are more productive than small farms and we can only say that small farms at not less productive than large farms.

Land reform contributed to significant structural changes in Moldovan agriculture. A recent survey conducted in 2008 (2008 ASM survey) accordingly covered the three main farm types that characterize the agriculture in Moldova today: household plots, peasant farms, and corporate farms. The household plot is usually situated close to the house, but not always. When the plot is situated outside the village, it is practically impossible to distinguish it from

the land of a peasant farm. The privatized land outside the village is considered a peasant farm (regardless of whether it is officially registered or not)[1]. Many people have chosen to lease out their land allotments outside the village to corporate farms or peasant farms, and to continue cultivating only their household plot. These specific aspects have been taken into consideration in our sample design.

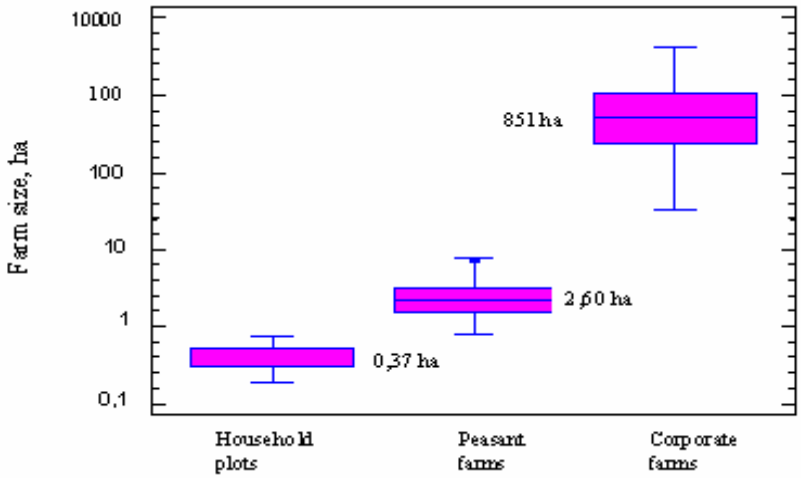
Table 1: Size distribution characteristics for farms of different types, in ha*

	Households (n=135)	Peasant farms (n=477)	Corporate farms (n=76)
Min-max range	0,10-0,75	0,76-18,40	3,2-4224
Mean size	0,37	2,61	851
Median size	0,30	2,16	529
Interquartile range	0,30-0,51	1,58-3,02	240-1071
Lower 10%	0,10	1,23	100
Upper 10%	0,68	3,98	2400
Number of parcels	3	6	

* Farm size expressed by land in actual use.

Source: 2008 ASM Survey.

Figure 1: Median size and interquartile range for farms of different types



Source: 2008 ASM Survey.

The three farm types surveyed span a wide range of farm sizes (**Table 1**), and we use our survey data to examine how farm sizes affect farm efficiency.[2] Household holds and peasant farms combined constitute the so-called individual sector, as opposed to corporate farms. There are distinctive differences between the individual and the corporate sectors (**Table 1**), while the two components of the individual sector – household plots and peasant farms – are much closer to one another by size. Still, there is no overlap between the interquartile ranges of these types of farms (**Figure 1**), which means that all three types of farms are significantly different by size. Thus, corporate farms are much larger than peasant farms, while the latter

[1] Official sources give conflicting information on the number of peasant farms and the area of agricultural land they control, their total number varying between 283 000 and 558 000, depending on the source of reference.

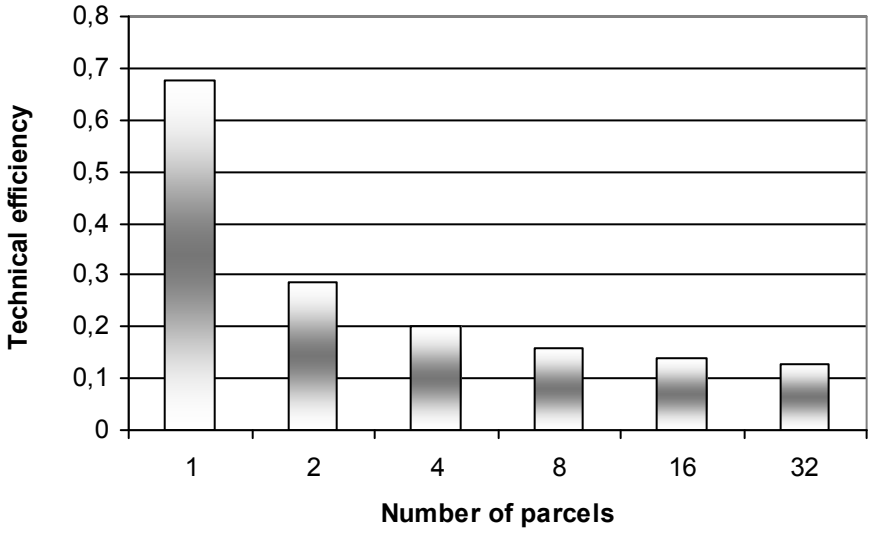
[2] Following Lund (1983), we use the land holdings as a measure of farm size.

are larger than household plots. Also, peasant farms being larger are more fragmented: 6 parcels compared to only 3 on average for households.

3 EFFICIENCY AND LAND CONSOLIDATION

Evidence of higher efficiency and productivity of larger, consolidated holdings would be a strong argument in favour of mass re-parcelling of fragmented family farms in Moldova. Previous studies (Lerman, Cimpoies, 2006; Lerman, Sutton, 2008) have revealed an interconnection between efficiency and farm size, demonstrating that small family farms are more efficient than large corporate farms. The 2008 ASM survey investigated mainly the effect that fragmentation of holdings into multiple parcels has on farm performance.

Figure 2: Technical efficiency versus fragmentation of peasant farms



Source: 2008 ASM Survey.

The advisability of reducing the number of parcels in a farm of a given size through land consolidation emerges from the negative correlation between the number of parcels and technical efficiency across farms as calculated by the stochastic frontier algorithms (SFA). Our survey reveals a clear negative relationship between productivity and the number of parcels held by the operator. **Figure 2** shows that the productivity (technical efficiency) decrease as fragmentation (i.e., the number of parcels in a farm) increases. The negative relationship between productivity and fragmentation in **Figure 2** is statistically significant by all standard measures. This new result reinforces earlier findings, which showed that two partial productivity measures – farm income per hectare and farm income per worker – decreased with fragmentation as measured by the number of parcels per farm (Lerman, Cimpoies, 2006).

4 FARM INCOMES AND LAND CONSOLIDATION

One of the major arguments in favour of land consolidation is based on the hypothesis that farmers with consolidated holdings have higher incomes and their family well-being is considerably higher than for farms with fragmented holdings.

Table 2: Linear regression analysis of farm revenue versus farm size and number of parcels*

Independent variables	Estimated coefficients	t value
Land used, ha	**1.977**	10.81
Costs, lei	0.432	6.39
Number of parcels	**-0.654**	-6.93
Employees, workers	1.376	5.20
Age of head of family	0.121	3.52
Intercept	-5.405	-2.72
R-square	0.788	
Number of observations	193	

* Dependent variable: farm revenues from sales

Source: 2008 ASM Survey.

Linear regression analysis shows that farm revenue from product sales increases with farm size (land used) and decreases with the number of parcels operated by the farmer **(Table 2)**. The important result here is that number of parcels has a negative effect on farm income when we control for other variables (the negative regression coefficient is significant at $p < 0.05$). Hence, consolidation, in the sense of reducing the number of parcels, makes economic sense for peasant farms and households in Moldova. Other statistically significant factors affecting farm income are farm costs and the number of workers employed: larger revenues are generated by larger farms, which, in addition to more land, involve higher total costs and more workers.[3]

5 RURAL FAMILY WELL-BEING AND LAND CONSOLIDATION

Consolidation affects not only farm productivity, but also the standard of living of rural families. One of the major arguments for re-parceling is the hypothesis that land consolidation increases farm income by raising the degree of commercialization, i.e., the share of output sold.

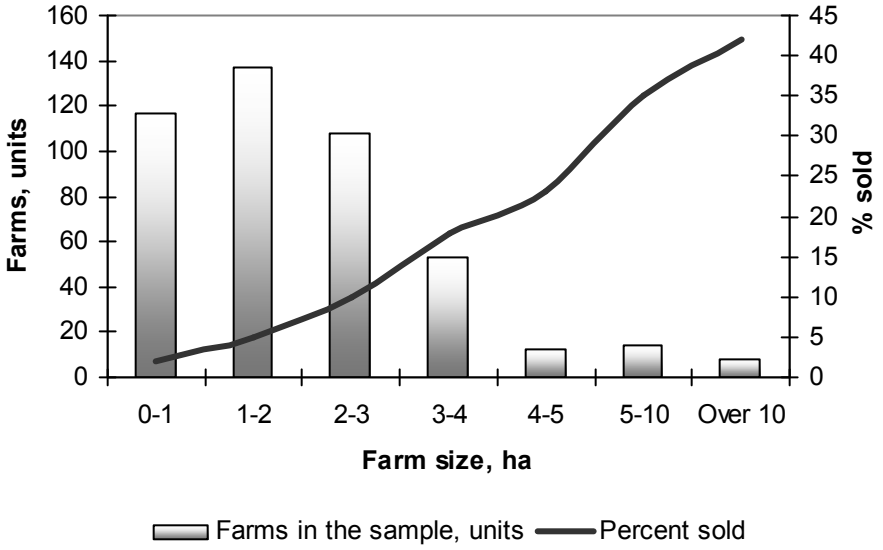
Family farms in Moldova are generally viewed as subsistence operations. Indeed, fully 80% of farms in the survey are smaller than 3 ha, reporting sales of less than 10% of their output (**Figure 3**). The share of output sold clearly increases with farm size. Thus, the commercialization rate of farms smaller than 1 ha is almost zero and these very small farms can be regarded as pure subsistence operations. On the other hand, farms larger than 5 ha can be regarded as practicing commercial farming: they sell more than 30 percent of their output. This is consistent with the results observed in other transition countries (Lerman, Sedik, 2007). The level of commercialization increases with farm size: while small farms use all they produce for family consumption, the output of larger farms exceeds the family needs, creating a marketable surplus.

Moreover, our survey revealed that the second dimension of land fragmentation, namely the number of parcels held by an operator, also affects the level of commercialization (**Figure 4**). As the number of parcels per ha, i.e. the level of fragmentation increases, the commercialization rate decreases. Family farmers operating one consolidated plot sell about 30 percent of their output, whereas those with highly fragmented holdings sell less than 5

[3] A similar study in Ukraine (Lerman, Sedik, 2007) noted a decrease of income with the age of the family head. In Moldova, on the other hand, the age of the head of family had a positive effect on farm revenues.

percent of the output. Thus, farmers with consolidated holdings have a higher marketable surplus, which is conducive to creating a higher farm income and thus increasing their families standard of living. Also, consolidated farms are much larger than fragmented farms. Consolidated farms have 3,6 ha on average, compared to 1 ha and less for highly fragmented farms (6 parcels and more). These results suggests that relatively large consolidated holdings stimulate commercial farming, while small fragmented plots lead to subsistence operation, with farm output used entirely for family consumption.

Figure 3: Farm size vs. commercialization



Source: 2008 ASM Survey.

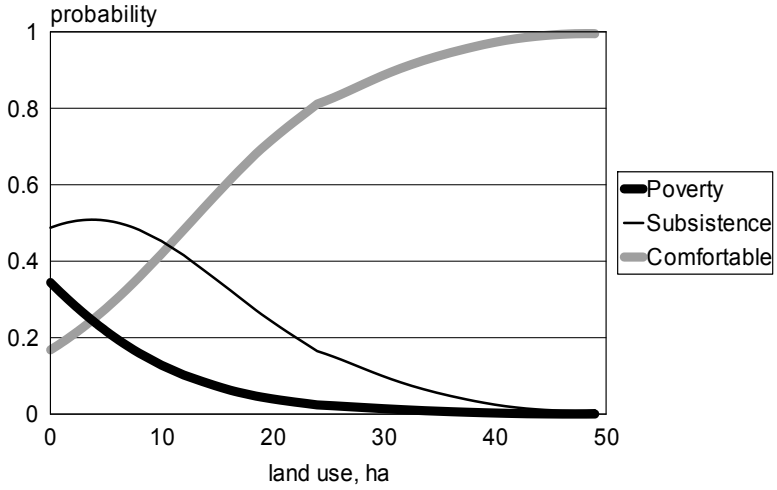
Figure 4: Fragmentation vs. commercialization

Source: 2008 ASM Survey.

Larger farm sizes generally lead to a higher standard of living of rural families. A comfortable standard of living is associated with a much larger farm size than lower standards of living. Peasant farmers reporting a comfortable standard of living in the 2005 World Bank survey (Lerman, Cimpoies, 2006) have 11 hectares on average, compared with less than 5 hectares

for farmers whose families are in lower standard of living categories – poverty, when family income is not sufficient to buy food, and subsistence, when family income is sufficient to buy food and daily necessities (the difference between farm sizes is statistically significant at $p < 0.01$). The standard of living of peasant farmers is thus an increasing function of farm size, as is commonly observed in farm surveys in other transition countries.

Figure 5: Probability of achieving a given standard of living as a function of farm size for peasant farmers



Note: Definition of standard of living levels: "poverty" – family income not sufficient to buy food; "subsistence" – family income just sufficient to buy food and daily necessities; "comfortable" – family income sufficient to buy food, daily necessities, and durables.

Source: 2005 World Bank survey (Lerman, Cimpoies, 2006).

The relationship between the standard of living and farm size is illustrated in **Figure 5**. Here the probability of being in the highest standard of living (gray curve) increases with farm size, while the probability of being on the lowest "poverty" level, when family income is not sufficient to buy food (thick black curve), sharply decreases with farm size.[4] These results provide the ultimate support for land consolidation policies and hence the need to encourage land market development.

6 LAND MARKETS AND LAND CONSOLIDATION

In Moldova land reform based on equity principles transformed all rural residents into small landowners as almost one million hectares of agricultural land was distributed to over 600,000 people. Among this multitude of smallholders, many remain inactive for various reasons (age, health, non-farming jobs, etc.). Mass distribution of small plots to individuals requires development of land market mechanisms to enable land to flow from less efficient to more efficient users, allowing farmers to adjust the size of their holdings. Land market is the only effective way to satisfy the new demand for land on the part of those who want to enlarge their farms.

[4] The probabilities of achieving a given standard of living were obtained in a multinomial logistic regression with the three-level standard of living as the discrete dependent variable and farm size as the continuous covariate.

One of the main objectives of land market development is the creation of viable family farms by transferring land from less efficient landowners to the most efficient farm operators or managers. The main mechanisms of land use transfer based on market principles are buying and selling of land and land leasing.

6.1 Buying and selling of agricultural land in Moldova

The moratorium on buying and selling of land introduced in December 1991[5] and the imposition of high transfer taxes for land transactions were initially major obstacles to the development of a viable land market in Moldova. In July 1997 new procedures for sale and purchase of land[6] removed the basic restrictions to the development of functioning land markets and 1997 can be regarded as the year of birth of the land market in Moldova.

Table 3: Buy-and-sell transactions with agricultural land

	Number of transactions	Transacted area, ha	Average transaction, ha	Average price per ha, MDL
1999	1933	232	0,12	3364
2000	9753	1268	0,13	3100
2001	24625	2336	0,09	2928
2002	27759	2682	0,10	3781
2003	49165	3595	0,07	3733
2004	44134	3201	0,07	8001
2005	47382	3250	0,07	9040
2006	51483	3773	0,07	11000
2007	65000	4697	0,07	12104
2008	72000	12911	0,17	10301
1999-2008	393234	37945	0,10	

Source: Botnarenco, 2009

Both the number of transactions and the transacted area grew rapidly (**Table 3**). About 40 000 ha of agricultural land changed ownership in 400 000 transactions between 1999 and 2008. Despite the impressive growth, this constitutes only 2 percent of the agricultural land in Moldova (2 million ha).

According to two surveys conducted in 2004 and 2006 (Cimpoies, Schulze, 2006; Cimpoies, 2007), the development of buy-and-sell transactions dramatically changed during a very short period of time. Farm managers began to understand the importance of having land in private ownership. Only a few years earlier most corporate farms had very little privately owned land, but now the picture is changing. Between 2003 and 2006, farm managers bought on average more than 100 ha per corporate farm and in 2008 fully 40% of corporate farms participated in land market transactions as land buyers **(Table 4)**. The share of own land in total land used by corporate farms increased substantially. As recently as 2003, 98% of cultivated land in corporate farms was leased, not owned (Gudym et al., 2003). In 2006, own land reached about 17% of total land used in corporate farms (Cimpoies, 2007), and in 2008 the share of own

[5] Land Code: Law No. 828-XII from 25.12.1991.
6 Law on Normative Price of Land and Procedure for Sale and Purchase of Land: Law No. 1308 – XIII from 25.07.1997.

land in corporate farms increased to 36% **(Table 4)**. Buy-and-sell transactions are also becoming more acceptable among individual farmers. In 2008, about 10% of peasant farmers reported that they had bought land, while 15% reported selling land (**Table 4**). These are respectable market participation rates, although they are far below the participation rates for corporate farms.

Table 4: Buying and selling of land in individual and corporate farms

		Percent of respondents	Farm size, ha	% of owned land
Bought land	Households	1,5	1,8	100,0
	Peasant farms	10,1	3,2	97,6
	Corporate farms	40,0	923,0	39,4
Did not buy land	Households	98,5	2,1	100,0
	Peasant farms	89,9	2,6	98,9
	Corporate farms	60,0	837,7	34,1
Sold land	Households	3,7	2,0	100,0
	Peasant farms	15,0	2,3	100,0
	Corporate farms	5,2	1199,8	50,8
All sample	Households	100	2,1	100,0
	Peasant farms	100	2,9	98,7
	Corporate farms	100	868,5	36,1

Source: 2008 ASM Survey.

The average size of a corporate farm that bought land is about 10% larger than the average size of a corporate farm that did not buy land **(Table 4)**. Similar trends are observed for peasant farms and household plots, which were 10%-20% larger than family farms that did not buy land. This might indicate that the development of land markets through buy-and-sell transactions has a positive effect on farm sizes and contributes to farm enlargement and hence to land consolidation.

Based on national data, the average land sale transaction remained fairly constant at around 0,10 ha between 1999 and 2007 **(Table 3)**. Then in 2008 it increased sharply to 0.17 ha per transaction. The increase in average transaction size may reflect certain parcel consolidation trends due to the launching of the National Land Consolidation Program at the end of 2007 (see below).

Despite these generally positive developments, the role of buy-and-sell transactions in land consolidation so far seems to be marginal compared to the role of the widespread leasing arrangements.

6.2 Development of agricultural land leasing in Moldova

The results of several recent surveys in Moldova (Gudym et al., 2003; World Bank, 2005) indicate that about half the small landowners created in the process of land reform do not farm their land and lease it to other operators.[7] The lessees are mainly corporate farms, which

[7] Land lease relations are governed by the Law on Agricultural Land Leasing passed in 2003. It tries to strike a balance between the interests of the operator and the socio-economic guarantees required by the landowner. The law clearly describes the formal part of the lease process and includes a detailed description of the lease

largely rely on leased land: 72% of land used by corporate farms is leased (**Table 5)**. Peasant farmers also act as lessees, but to a much smaller extent than corporate farms: they generally cultivate owned land with some leased land mobilized to increase their original endowment. As we see in **Table 5**, peasant farms leasing in land are substantially larger than farms that rely on own land only.

Table 5: Participation in land leasing

		Households	Peasant farms	Corporate farms
Leasing out	% of respondents	92	16	4
	Farm size, ha	2,1	3,2	1117
	% own land	100	99,3	100
Leasing in	% of respondents	0	5	71
	Farm size, ha	0,0	4,7	826
	% own land	100	69,7	28,2
Use own land only	% of respondents	8	78	17
	Farm size, ha	2,5	2,7	1159
	% own land	100	100	100

Source: 2008 ASM Survey.

Household plots, contrary to corporate and peasant farms, do not lease in land. **Table 5** demonstrates a sharp dichotomy between household plots as supply side players and commercial producers (peasant farms and corporate farms) as agents of the demand side in land markets. Households actually use less than 20% of their holdings (0.4 ha out of 2.5 ha in total). The rest is leased out. Analysis of leasing participation rates in **Table 5** shows that 92% of households lease out land and none leases in land. At the other extreme, 71% of corporate farms lease in land and virtually none leases out. Peasant farms occupy an intermediate position: they act as both lessees and lessors, yet their supply side role clearly predominates: only 5% of peasant farms lease in land while 16% lease out.

Table 6: Grouping of household plots by land leasing strategies

	Farm all owned land	Lease out	Lease in
Number of respondents	391	202	24
Percent of respondents	63	33	4
Own land, ha	2,6	2,7	3,2
Used land, ha	2,5	1,1	4,1
Wish to enlarge, ha	3,3	3,3	6,6
Number of family members	3	2	4
Age of head of family	53	57	49
Age of spouse	50	51	41

Source: 2008 ASM Survey.

agreement. In general, the spirit of the new law is restrictive. In particular, term limits are stipulated. The lease payment is set at not less than 2% of the administratively prescribed normative price of land, without linkage to the actual market price, which is generally much lower. However, such limitations are not effective, because the lease payments are typically negotiated as a share of the harvest and their equivalent value is higher than the stipulated minimum percentage.

Additional evidence that leasing in is used as a mechanism for augmentation of farm size is provided by household plots. The few families that lease in land operate larger household plots than families farming exclusively their own land and those only leasing out land **(Table 6)**. Moreover, families that lease in land are larger than families using only their own land and those leasing out a portion of their land: 4 members compared to 3 and 2 respectively. Thus, families with insufficient labor prefer to lease out their land, while families with more members available for farm work prefer to extend their own area by leasing in land from others. Moreover, families leasing in land are younger than families in the other two groups, which again positively affects labor availability.

6.3 Reasons for land leasing

Why do farmers and farm managers lease in land? Farm managers realize that land consolidation allows them to use land more efficiently (Cimpoieş, Schulze, 2006). In a 2003 survey of 104 corporate farms in Moldova (Cimpoies, Schulze, 2006) more than 40% of farm managers expressed the view that it was more profitable and more efficient to cultivate a larger plot. Nearly 30% indicated that they preferred to lease plots adjacent to the existing farm. In the 2008 ASM survey, the profitability of cultivation of larger plots was no longer as important for enlargement of holdings as in 2003: less than 12% of corporate farm managers mentioned it as an important consideration, down from more than 40% in 2003. On the other hand, for individual farms the profitability of cultivating a larger plot is still a major reason for enlargement **(Table 7)**. No change was registered in the second factor: as five years previously, enlargement of holdings by leasing in parcels from close neighbors remains important for about 25%-30% of respondents.

Proximity to the existing farm and the conviction that it is more profitable to cultivate a larger farm explain the strategy of leasing in additional land, mainly from households, but also from peasant farms.

Table 7: Reasons to lease in land for individual and corporate farms

	Individual farms	Corporate farms
Plot adjacent to the existing farm	**25,0**	**30,5**
Land of high quality	7,5	17,9
Access to irrigation	10,0	11,6
Good placement of plot	15,0	9,5
More profitable to cultivate more land	**27,5**	11,6
Enough cheap workforce	10,0	14,7
Other reasons	5,0	4,2

Source: 2008 ASM Survey.

What reasons do the individual farms, mainly households, give for leasing out land? The main reason is insufficiency of resources for active farming. In a 2003 survey (Gudym et al., 2003), 65% of lessors identified lack of machinery and purchased inputs as the main cause for leasing out land. Age was also one of the important reasons for leasing out land – this was indicated by every fourth landowner. In the 2005 World Bank survey, 40% of lessors put the blame on insufficient labor, while difficulties with access to purchased inputs and credit (or money in general) ranked next. In aggregate, reasons associated with the normal functioning of markets are cited by 78% of the households in the 2005 survey as responsible for their decision to lease out land (Lerman, Cimpoies, 2006).

It may be argued that these individuals would tend to farm the land on their own if the missing or distorted markets were corrected. This conjecture is supported by the observation that respondents who attribute leasing to market imperfections express a desire to increase their plot size by a substantially greater factor than respondents who lease out because of physical deficiencies of their land (Lerman, Cimpoies, 2006).

Health and age are important factors in the decision to lease out for pensioners and elderly people. In one survey conducted in 2003 (Gudym et al., 2003), 80% of the pensioners and 70% of landowners older than 60 cited health and age as main reasons for leasing out their land. In another 2003 survey (Muravschi, Bucatca, 2005), the highest percentage of landowners who intended to lease out their land (36%) were 60 or older.

Table 8 summarizes the answers of the heads of individual farms in the 2008 ASM survey regarding the reasons for leaving some parcels of their land uncultivated. We have included in this sample farmers and household plot operators who lease out land, as well as those who cultivate only a part of their holdings, without leasing out the rest.

Table 8: Reasons for not cultivating the entire available land in individual farms

	percent of respondents
Insufficient labor	**28,7**
Lack of machinery	12,1
Lack of fuel	4,2
Inputs not available	5,2
No money	**24,2**
Land of poor quality	3,1
Not profitable	**20,4**
Other reasons	2,1
Total	**100**

Source: 2008 ASM Survey.

Lack of fuel, fertilizers, and other purchased inputs, as well as poor land quality are not reported as serious obstacles by the respondents. Lack of working capital and low profitability are considered as very serious constraints among those who do not cultivate all their land. The most important single reason is insufficient labor, cited by about 30% of the respondents. This is consistent with the observation that smaller families lease out land, while larger families lease in **(Table 6)**.

Although lack of machinery is cited by 12% of respondents, it is not as vital as, for example, in Ukraine, where this constraint is reported by 26% (Lerman et al., 2007). This difference in the perception of machinery constraints is presumably attributable to the small size of peasant farms in Moldova (2,7 ha compared with 146 ha in Ukraine), which can be worked manually by the family members. Larger farms in Moldova have the option of renting machinery from machinery stations or from collective farms.

Lease payments in Moldova exist in three forms: cash, in-kind, and mixed payments. Payment in-kind is the most prevalent form, used by over 80% of the respondents (Gudym et al., 2003).

It is followed by mixed payments (about 10%). The low acceptance of cash lease payment (less than 5%) can be explained by two reasons. First, monetary relations are in general poorly developed in the agrarian sector in Moldova. Second, families leasing out land prefer to receive payment in kind because the goods can be directly consumed by the family (Cimpoies, Baltag, 2004).

The lease payments for different farm types are shown in **Table 9**. The median varies between 800 and 1000 MDL per hectare,[8] while the mean is 1100-1300 MDL per hectare per year, being more sensitive to outliers than the median. Corporate farms do not exercise their power in local land markets and do not push the lease payments to a much lower level. According to the 2008 ASM survey, the payments by corporate farms do not differ substantially from those reported in the individual sector.[9]

Table 9: Lease payment for farms of different types

	Households (lease out)	Peasant farms (lease in)	Corporate farms (lease in)
% leasing	44	9	66
Average leased, ha	1,83	2,92	669
Payment, lei/ha			
mean in kind	943	745	1040
mean in cash	1449	1431	783
mean total	1137	1276	1105
Median	1000	839	803

Source: 2008 ASM Survey.

Another attribute of lease agreements is the lease term **(Table 10)**. Long-term lease relations build the trust between the owner and the lessee, motivating the latter to invest in more effective utilization of the land. Our results indicate that long-term leasing is not widespread in Moldova. Corporate farms are the only category of farms that sign long term lease agreements: about 5% of the farm managers concluded agreements for 10-30 years. As a rule, these long-term lessees also develop a processing activity. For example, wineries prefer to conclude lease agreements for a term of 30 years in order to plant new vineyards, which require significant investment. Therefore, they need stability in the system of lease relations.

Table 10: Lease term for farms of different types

	Households	Peasant farms	Corporate farms
1-3	14	**90**	**80**
4-5	6	0	5
6-10	**80**	10	10
> 10 years	0	0	5

Source: 2008 ASM Survey.

[8] 1 Euro = 16,5 MDL (the average official rate for 2007)

[9] Lease payments play only a marginal role in family income. Remittances from family members working abroad are much more important than lease payments as a source of income for most rural families.

Short term lease agreements for a term of 1-3 years prevail in peasant and corporate farms: about 80%-90% of respondents. Household plots prefer to lease out their land for a medium term: 80% of respondents lease out their land for a term of 6-10 years.

7 FORMAL LAND CONSOLIDATION EFFORTS IN MOLDOVAN AGRICULTURE

The various approaches to land consolidation are based on common principles. First, land consolidation schemes should not deprive people of their right to land and should not create landless people. The process should be participatory, democratic, and based on market principles. Second, policy makers should remember that not all fragmentation is a problem. Land consolidation programs should address only those cases were land fragmentation is a real problem and not attempt to impose a solution were it is not needed. Finally, we have to accept that it will not be possible to eliminate land fragmentation entirely.

The State Planning Institute for Land Management has been the traditional vehicle for land consolidation in Moldova. Nine consolidation projects, mainly in the south of the country, were carried out in recent years, but lack of funding limited the Institute's consolidation activities. The projects typically focused on a mechanism whereby an investor buys or leases land from smallholders.

Valuable experience with the implementation and design of land consolidation had been accumulated since May 2003 in the framework of the USAID-funded Land Privatization Support Project (LPSP), which ended in 2005. In most LPSP projects the instrument of consolidation is selling land to an investor, not leasing. An LPSP consolidation project was typically initiated by a buyer (a winery or an agricultural enterprise), who over a period of time had tried to purchase contiguous land plots for large-scale agricultural production. It was the responsibility of the buyer to negotiate the agreements with the small individual owners. The project served as an intermediary between landowners and buyers and supported the mayor's office in the village in the use of a simplified land transaction method developed under the LPSP in compliance with the procedures of the 2002 Amendment to the Land Code. When small owners with land plots in the interest area preferred not to sell their land, they were normally offered voluntary exchange of their land for other plots in order to make the original land available for the project initiator. The focus of the LPSP consolidation projects was the main buyer or investor, and the result was development of large-scale farms, often owned by wineries or agricultural enterprises from outside of the village.

Given the accumulated experience, the Government of Moldova has decided to implement a National Program of Land Consolidation (NPLC) with financial support from the World Bank, based on concepts proposed by a team from the Danish Ministry of Agriculture (Haldrup, Hartvigsen, 2005). In contrast to previous land consolidation activities, the new program focused primarily on small and medium-sized family farms (3-30 ha) and not on large corporate structures. The operational emphasis was on landowner preferences and on identifying land exchanges in which people were willing and able to engage. The success of the procedure depended entirely on the willingness and readiness of landowners to exchange their land plots. Unfortunately, in a 2003 survey over 80% of respondents indicated that they would not agree to exchange their existing land plot for a new one in the process of land consolidation (Muravschi, Bucatca, 2005).

The entire process was based on voluntary participation and the participants retained the freedom of choice throughout: they could decide to leave the project at any stage before the final transaction agreement was signed. The consolidation solution was not known at the

outset and it only emerged at the very end as a result of multilateral negotiations. There was no need to secure guidance or approval by the authorities, and the voluntary participatory nature of the process reduced the likelihood of costly and time-consuming appeals.

The NPLC was launched in August 2007 in six pilot villages, thus enabling the procedures to be ironed out before national rollout. The length of the project was 18 months and it ended in February 2009. During the 18-month period, the project tested the demand for voluntary land consolidation from small landholders and verified the available sporadic evidence that indicated popular support for small-scale consolidation.

Table 11: Land consolidation pilot project: preliminary results

	Villages					
	Busauca	**Sadova**	**Bolduresti**	**Calmatui**	**Opaci**	**Baimaclia**
Number of land parcels	3088	5922	6006	1757	5626	4204
Number of landowners	708	1319	1786	634	1762	1048
Estimated number of participating landowners in % of all landowners	60	19	62	47	23	33
Average parcel size, ha	0,50	0,21	0,29	0,40	0,60	0,73
Average number of parcels per landowner	4,72	4,49	3,36	3,69	3,19	5,08
Percent of parcels offered for sale	25,6	13,6	28,1	12,9	14,7	19,7
Percent of parcels offered for exchange	1,6	7,3	3,1	11,0	1,2	1,8
Percent of owners willing to lease out land	9	0	46	90	26	25
Public agricultural land available as a reserve for land consolidation, ha	15	45	46	1,4	19	7

Sources: Implementation of land re-parcelling pilots in six villages: Mid-term report, May 2008.
Implementation of land re-parcelling pilots in six villages: Progress report II, September 2008.

The land consolidation pilot project has generally produced positive results, but its final achievements are much more modest than originally expected. Big questions arise with the procedure of parcels exchange, which is one of the main instruments of re-parcelling. As we see from **Table 11**, an insignificant number of parcels have been offered for exchange. Also, the small area of the public reserve land in local primaria (mayoralities) makes the task of land consolidation extremely difficult.

One of the possible barriers to project success is a low demand for land or absence of active buyers in many rural locations. Absentee ownership or non-participation may also require

development of new imaginative tools. How to proceed with land consolidation if there are parcels belonging to absentee owners in the middle of the field or if a small number of landowners refuse to participate and instead try to sell their land to outsiders at speculative prices?

Two possible solutions to these difficulties – both requiring new legislation – are being currently debated in Moldova. According to one proposal, landowners who do not farm their land for a certain length of time (e.g., three years) will be obliged to sell their holdings to the local authorities at the average market price. The authorities will then re-sell the land to active farmers at the same average price, thus taking part in the consolidation process in the role of a local land bank. According to another proposal, if a small minority of landowners (e.g., 10%) block the local consolidation program by their refusal to participate (i.e., voluntarily sell or exchange their land parcels), they will be obliged by law to exchange their plots for equivalent land from the village reserve (if other options to use reserve land directly for consolidation have failed).

The project ended its activities in January 2009. In response to a request from the Government of Moldova, larger scale re-parcelling activities will be implemented by the World Bank in 40 new villages during the period from February 2009 through June 2010.

Although formal re-parceling programs can be very effective, they should supplement market-driven consolidation and stimulate land market development through buying and leasing of land by private entrepreneurs, not replace it.

8 CONCLUSIONS AND RECOMMENDATIONS

Land consolidation through land market development has a positive effect on farm efficiency. A clear negative relationship was observed between productivity and the number of parcels held by the farmer. An additional argument in favour of land consolidation is that farm revenue from product sales increases with farm size and decreases with the number of parcels operated.

Consolidation affects not only farm productivity, but also the standard of living of rural families, by raising the degree of commercialization and thus contributing to higher family income. Larger individual farms attain a higher level of commercial sales, because they consume a substantially smaller proportion of their output than the very small farms. Also, as the number of parcels per ha increases, the commercialization rate decreases.

Farms leasing in land, as well as those that bought land are larger than farms that rely on their own land only. The prevalence of short-term lease agreements is an obstacle to land consolidation as it discourages investment by lessees in land improvement and infrastructure. Agricultural policy therefore should encourage longer term leasing. It should also strive to reduce transaction costs for buying and selling of land, which are at present excessive and constitute an obstacle to the development of buy-and-sell transactions for land consolidation (Lerman, Cimpoies, 2006).

The common approach to land consolidation in Moldova is individual or market-driven consolidation, which relies on land market transactions – mainly leasing at the present stage. Market-driven consolidation of agricultural land does not require new legislation, as the existing land laws are sufficient for this purpose. Consolidation based on formal government-sponsored projects will require certain amendments to the Land Code.

Consolidation of small fragmented parcels into contiguous holdings is preferred by both farmers and landowners. However, land consolidation should be carried out on a voluntary basis in accordance with market principles. Land consolidation projects should supplement market-driven consolidation, not replace it.

REFERENCES

Household and Farm Surveys:

2005 World Bank survey: see World Bank (2005).

2003 PFAP survey: see Muravschi, Bucatca (2005).

2003 CISR survey: see Gudym et al. (2003).

2003 IAMO survey: see Cimpoieş, Schulze (2006).

2006 UASM Survey of farm managers: see Cimpoies (2007).

2008 ASM Survey (unpublished).

Other sources

Botnarenco, I. (2009). Consolidarea terenurilor agricole în Moldova: teorie, metode, practică. Chişinău, Moldova: Pontos.

Cimpoieş, D. (2007). Economic impacts of land market development: evidence from Moldova. Studies on the Agricultural and Food Sector in Central and Eastern Europe 39. Leibniz Institute of Agricultural Development in Central and Eastern Europe (IAMO). Halle (Saale): IAMO.

Cimpoieş, D., Schulze, E. (2006). Economic and Financial State of Farm Enterprises in Moldova, *IAMO Discussion Paper No. 91*, IAMO – Leibniz Institute of Agricultural Development in Central and Eastern Europe, Halle (Saale), Germany.

Cimpoieş, D., Baltag, G. (2004). Lease as a form of land consolidation in Moldavian Agriculture. Studies on the Agricultural and Food Sector in Central and Eastern Europe 25. Institute of Agricultural Development in Central and Eastern Europe (IAMO). Halle (Saale): IAMO.

DSS (2004a). *Agricultural Activity of Households and Farms in the Republic of Moldova in 2003 (Results of the Statistical Survey)*. Department of Statistics and Sociology, Chisinau, Moldova.

DSS (2004b). *Agriculture in Moldova 2004*, Department of Statistics and Sociology, Chisinau, Moldova.

Gudym, A., Turkan, V., Jigau, I. (2003). *Lease of Agricultural Lands 2003*, CISR – Center for Strategic Studies and Reforms, Chisinau. Moldova.

Hartvigsen, M. (2008). Implementation of land re-parceling pilots in six villages (Moldova land re-parceling pilot project). Mid-term report. May, 2008. MAIA. Chisinau. Moldova.

Hartvigsen, M. (2008). Implementation of land re-parceling pilots in six villages (Moldova land re-parceling pilot project). Process report II. September, 2008. MAIA. Chisinau. Moldova.

Kanchev, I., Doichinova, Iu. (2000). Agrarian structures in Bulgaria – problems and development. In: Tillack, P., Pirscher, F. (eds.), *Competitiveness of Agricultural Enterprises and Farm Activities in Transition Countries*. Kiel: Wissenschaftsverlag Vauk, 240-250.

Koester, U., Striewe, L. (1999). Huge potential, huge losses – the search for ways out of the dilemma of Ukrainian agriculture. In: Siedenberg, A., Hoffman, L. (eds.), *Ukraine at the Crossroads: Economic Reforms in International Perspective*. New York: Physica-Verlag, 257-270.

Lerman, Z., Cimpoieş, D. (2006). Land consolidation as a factor for rural development in Moldova, *Europe-Asia Studies* 58, No. 3: 439-455.

Lerman, Z., Sedik, D., Pugachov, N., and Goncharuk, A. (2007). *Rethinking Agricultural Reform in Ukraine*. Halle (Saale), Germany: IAMO.

Lerman, Z., Sedik, D. (2007). The role of land markets in improving rural incomes. Discussion Paper No. 15.07, the Center of Agricultural Economic Research, the Hebrew University of Jerusalem.

Lerman, Z., Sutton, W. (2008). Productivity and efficiency of small and large farms in transition: Evidence from Moldova, *Post-Soviet Affairs*, 24: No. 2: 97-120.

Lund, P. (1983). The use of alternative measures of farm size in analysis of size and efficiency relationship. *Journal of Agricultural Economics* 2: 187-189.

Muravschi, A., Bucatca, A. (2005). *Agricultural Policy in Farmers' Opinion*. PFAP - Private Farmers Assistance Program, East-West Management Institute and USAID, Chisinau, Moldova.

World Bank (2005). *Moldova Agricultural Policy Notes: Agricultural Land*, Draft analytical report, World Bank, Washington, DC (unpublished).