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CURRENCY EQUIVALENTS

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ACRONYMS AND ABBREVIATIONS

ACSA	Agency for Consulting and Training in Agriculture
CEE	Central and Eastern Europe
CEM	Country Economic Memorandum (World Bank)
CIS	Commonwealth of Independent States
DAI	Development Alternatives Inc.
ECA	Europe and Central Asia
EGPRSP	Economic Growth and Poverty Reduction Strategy Paper
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
GDP	Gross Domestic Product
IFPRI	International Food Policy Research Institute
LPSP	Land Privatization Support Project (USAID)
MAFI	Ministry of Agriculture and Food Industry
MDL	Moldovan Leu (Lei)
NGO	Non-Governmental Organization
NLP	National Land Program
PFAP	Private Farmers Assistance Program (USAID)
TFP	Total Factor Productivity
USAID	United States Agency for International Development
WB	The World Bank

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FOREWORD

This report was prepared by a team led by William Sutton, and comprising Zvi Lerman, Niels Otto Haldrup, Morten Hartvigsen, Stephen Butler, Alexandru Muravschi, Victor Moroz, and Natalia Otel. The report was prepared under the guidance of Sector Manager Benoit Blarel. Peer reviewers are Edward Cook, Stephen Mink and Mona Sur. This study would not have been possible without the assistance and cooperation of the Government of Moldova, and in particular the Ministry of Agriculture and Food Industry, the Cadastre Agency, and the Department of Statistics. In addition, we would like to thank all of those in the private sector, civil society and development partners who gave generously of their time and information. The team would also like to thank Edward Brown, World Bank Country Manager, and the staff of the World Bank Moldova Country Office for their assistance, especially Tamara Ursu who helped with all of the logistics.

EXECUTIVE SUMMARY

Moldova has made some very impressive achievements in land reform since the introduction of the National Land Program (NLP) in 1998-99. These include a dramatic increase in private land ownership, which rose from practically zero in 1989 to 67% of all agricultural land (and to an even more impressive 80% of agricultural land used by producers), and a virtually complete allocation of physical plots to more than one million rural people. These highly positive developments appear to have led to the tentative signs of recovery in agriculture that we observe since 2000, when the steep decline in agricultural production was arrested and both output and productivity resumed growth. The growth in agriculture has been very slight so far, especially due to the intervening drought year in 2003, but if it is indeed associated with the progress in reforms, as we believe, more robust growth can be expected in the immediate future. **Our main recommendation is therefore that Moldova stay the course of its reforms and resist experimenting with major reversals of strategy until the achievements made so far have had time to produce their full impact**.

The progress with land privatization has not been fully matched by progress with individualization of agriculture – the second main facet of the transition to market-based agriculture. Fully 50% of agricultural land in production in Moldova is still controlled by large-scale corporate farms. In itself, this is also an achievement, far surpassing the reform outcomes in Russia and Ukraine (where large corporate farms still control about 80% of agricultural land). Yet it does not go far enough compared to land use patterns in market economies, where corporate farms typically control less than 2% of agricultural land. Of course market agriculture supports a wide spectrum of organizational forms, ranging from very small part-time family units (equivalent to household plots in Moldova) to fairly large corporate farms. Two salient points should be borne in mind, however:

- **Internationally, market agriculture is primarily agriculture of family farms, not corporate farms:** corporate farms are few in number and control a very small share of agricultural land.
- **Corporate farms in market agriculture are on average much smaller than corporate farms in Moldova**: they fall in the range of 100-300 hectares rather than 1,000-3,000 hectares as is often the case in Moldova.

Individual family farms in Moldova are more efficient and more productive than large corporate farms, including production cooperatives. The farm structure conundrum as formulated in the two bullets above has two dimensions: (a) the organizational-form dimension – individual farms versus corporate farms; and (b) the size dimension – small farms versus large farms. These two dimensions are highly correlated in Moldova (though less so in other countries). With regard to organizational form, one thing is clear: agricultural production cooperatives everywhere are less efficient than individual farms and market-oriented corporate farms. This is suggested by the well-developed theory of cooperatives, but more importantly, this is proved by the almost total nonexistence of production cooperatives in market economies.[1] With regard to the farm size dimension, our analytical

[1] The Israeli kibbutz is often cited as a counterexample to this proposition, but this is inaccurate: (a) in all the history of Israel there have never been more than 200 kibbutzim – which is essentially zero in a world perspective; (b) the Israeli kibbutz has been undergoing radical organizational changes since the late 1980s, which include privatization of common property and individualization of common activities; (c) during the decades until the 1970s the kibbutz as a cooperative was held together by deep ideological commitment of its members and by its ability to ensure a higher standard of living than in the city – neither of which is valid today in Israel or has ever been valid for cooperatives in Moldova.

results for Moldova based on several surveys indicate with considerable confidence that small farms are more efficient than large farms. Because measuring labor productivity and land productivity separately can give inconclusive results, we have calculated total factor productivity (TFP) for small and large farms in Moldova. The advantage of TFP is that it takes into account both land and labor inputs. The results in **Figure 1** indicate that small farms (which are almost exclusively individually owned) are more efficient than large farms (which are almost exclusively corporate). This finding for Moldova is supported by a recent study of U.S. farms, which has found that an increase of farm size reduces agricultural productivity (as measured by TFP). This does not mean that there is no room for corporate farms. The market economies have achieved an equilibrium farm structure, which includes a mix of individual farms (the dominant majority) and corporate farms (a small minority) determined by crop, resource availability, managerial capacity, and personal preferences of farmers and investors. A similar process can unfold in Moldova, but the development of corporate farms should be left to market forces, free from government intervention and programming.

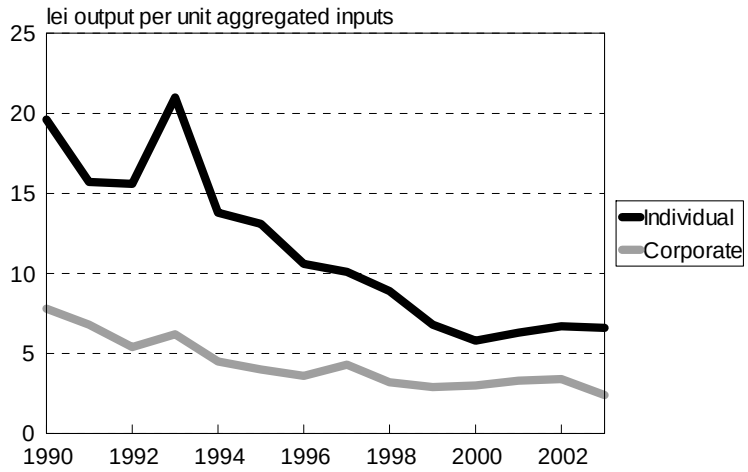

Figure 1: Total factor productivity for individual and corporate farms, 1990-2003

Moldova is better off today than if it had not implemented farm restructuring and land privatization. While it is understandable that many in Moldova's agricultural sector feel worse off today than they did under the Soviet system due to the challenges of transition, this is not a valid comparison. It is important to recall the motivation behind the farm restructuring that occurred in Moldova in the 1990s: without the heavily subsidized inputs and guaranteed markets provided by the Soviet system, the former collective and state farms could not compete and were soon bankrupt. The Government of Moldova does not have the resources to re-create such subsidies today, and the former distribution channels no longer exist. The large corporate farms that remain in Moldova are a carryover from the Soviet era. The Soviet agricultural ideology was driven by expectations of economies of scale. This ideology is at the root of many of the persistent complaints about fragmentation of agricultural holdings and the need to achieve consolidation by transition to large cooperatives or corporations. In reality, nearly a century of research by agricultural economists around the globe has demonstrated that on average, family farmers use resources more efficiently than large, commercial farmers—in other words, diseconomies of scale are the norm in agriculture. Thanks to the efficiency advantages mentioned above, **in Moldova small individual farms now produce over 70 percent of agricultural output on about 50 percent of the land**.

In looking across CIS countries, those that have made the successful transition to individual family farming are performing better than those that have resisted reform. In the specific case of CIS countries in transition, attempts to preserve large-scale corporate structures in former Soviet republics (whether as agricultural cooperatives or as new corporations with market-sounding names) have generally failed. The Russian and Ukrainian ideal of "horizontal transformation", making persistently inefficient corporate farms suddenly efficient, has not worked. On the contrary, it is the three small countries that resolutely abandoned the large-scale structures and made a clean shift to small-scale individual agriculture – Armenia, Azerbaijan, and Kyrgyzstan – that demonstrate the most impressive recovery

record among the CIS countries in recent years. Moldova has more in common with these three small, densely populated countries than with Russia and Ukraine.

To move closer to the farm-structure pattern typical of market economies, Moldova would have to facilitate the flow of land from large corporate farms to smaller individual farms. A comparative analysis of farm structure in Moldova and EU countries (as representatives of the market economy) shows that Moldova remains characterized by much greater land concentration in large farms than any of the EU countries. Particularly in those countries with agricultural conditions most similar to Moldova's, such as Portugal and Greece, the large-farm sector controls a much smaller proportion of land, and small farms achieve much greater dominance. It should also be noted that despite their small size, EU farmers still manage to apply the most modern technologies.[2] Increasing the individualization of agriculture by reducing the concentration of land in large farms, while at the same time increasing the share of land controlled by the small individual farms, would bring Moldova into closer conformity with the market pattern of land concentration. At the same time it would correct, at least partially, one of the two manifestations of land fragmentation in Moldova: the average size of the very small individual farms will increase somewhat as they acquire more land at the expense of large corporate farms. In addition, land would also likely flow to individual family, or "peasant", farms from the very small plots of households unwilling or unable to farm them. Based on Moldova's comparative advantages in the production of high-value fruits and vegetables (see the Agricultural Markets Policy Note), it is probably realistic to expect that in the future the majority of viable family farms will likely be in the range of 2 to 50 hectares. However, **in market agriculture there is no one "optimal" farm size**; the best farm size is determined by the farmer based on his or her circumstances and preferences, particularly the type of crop grown.

To allow for a more efficient farm structure to evolve, Government should ensure a level playing field for farms of all sizes and organizational forms, and avoid policies that favor large farms. The ways in which government policies favor large corporate farms include subsidies for planting of vineyards and purchase of machinery that are only accessible by them (these are discussed in more detail in the Agricultural Expenditures Policy Note). The analysis of the farm-structure issue suggests that Moldova would have little to gain from a preference for large-scale corporate farms and should instead concentrate on improving the operating conditions for individual family farms. With regard to land, it is important that any program to encourage land consolidation or re-parceling not favor the interests of large, corporate farms, as this would be counterproductive in terms of efficiency.

Land markets, and not government regulation, are the main tools for adjustment of farm sizes towards greater productivity and efficiency. Agricultural "land consolidation" is often tabled as the priority for addressing the poor performance of the agricultural sector in Moldova. However, government-sponsored land consolidation is useful only to the extent that it improves the efficient functioning of land markets, and improved land markets are only useful to the extent that—combined with other enhancements to policies, services and investments for the sector—they improve productivity and promote agricultural growth and rural poverty reduction. In addition, land markets in Moldova are already beginning to function as conduits of land transfer and consolidation without government intervention. The sales market has developed rapidly, with the number of transactions and the average size of each transaction both increasing. Consolidation of land use through leasing is even more widely practiced. The primacy of transparent land markets in the continued re-structuring of farms and any consolidation of land is codified in Government's own "Economic Growth and Poverty Reduction Strategy Paper (EGPRSP).[3]

[2] Indeed, many technologies such as the use of greenhouses and drip irrigation can more readily be applied on smaller, more intensive farms

[3] "Land consolidation will be addressed through the further development of the agricultural land market," para. 430,

To improve land markets, it is necessary to reduce transaction costs, increase information availability and ensure tenure security. Frequent talk of mandatory, "administrative" agricultural land consolidation has frightened landowners and potential investors in the sector, discouraged the development of land sales markets, and promoted short-term leasing in its place. If Government instead strives to protect all parties through secure tenure and increased information on rights, owners and potential investors will be re-assured that their property rights will be respected. This will in turn increase the incentive for purchase and long-term lease of agricultural land and investment in improvement of the land (including, for example, investment in appropriate irrigation infrastructure). In addition, government action is recommended with the objective of facilitating ownership transfers and encouraging the development of land markets as follows:

- Simplify the administrative procedures for transfer of ownership (paperwork, number of trips to regional cadastre office, etc.).
- Reduce transaction costs by reducing the minimum fee charged by notaries and calculating it pro rata, and by allowing multiple parcels to be treated as one consolidated transaction.
- Improve the availability of market information on land transactions and prices.
- Instruct both parties to land transactions, and in this case household landowners in particular, on their rights under the law and provide for out-of-court arbitration for dispute resolution.

Use leasing is a practical alternative to land sales in order to facilitate more efficient allocation of land. Leasing is a basic component of land market transactions in all market economies, and it supplements land purchase by providing an additional channel for transfer of land to more efficient users and for adjustment of farm sizes. A new World Bank study on land rental markets has revealed that land leasing is fully consistent with modern agricultural systems, and widespread in developed market economies (in the US for example, commercial farms lease in on average half of the land they use). It is also generally more important for land exchange than sales in European and Central Asian (ECA) countries, and can provide important benefits during the transition to a market economy. The potential benefits of land rental markets include that they:

- Allow more flexible adjustments of the land area used with relatively low transaction costs;
- Require only a limited capital outlay, thereby leaving more liquidity available for productive investments rather than locking it all up in land;
- Facilitate easy reallocation of land toward more efficient users than the current owners; and
- Provide a stepping-stone towards land ownership by the landless.

Lease markets are already important in Moldova, although most leases are very short-term. Land leasing is also an important source of income for rural households, though it could be even more so if lessees honored their obligations more often. To better realize the potential benefits of leasing, Government should ensure the security of ownership rights while providing sufficient incentive for farm investments by tenants.

Although there is insufficient evidence of its impact on agricultural production, there is widespread concern in Moldova about the other dimension of land fragmentation, which involves fragmentation of land parcels (rather than farm size). We did not have data in this study to adequately examine how fragmentation of small holdings into several (even smaller) parcels affects productivity in Moldova, and international evidence on this question is mixed. In the absence of official data on the subject, a special survey needs to be conducted to capture both fragmentation and production variables for

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EGPRSP, Government of Moldova, Chisinau, May 2004.

a sample of farms of different types. There is some evidence of a negative relationship between productivity and fragmentation of parcels at the household level (very small farms) from an earlier survey. But unless a special survey is conducted that also includes peasant and corporate farms, we will not be able to establish with any degree of authority whether fragmentation of holdings into small parcels has a negative effect on productivity or not. In general, decision-making on agricultural policy in Moldova would be greatly facilitated by improved quality, coverage and availability of data. Despite the lack of hard evidence, it is widely believed in Moldova that consolidation of small, disjointed parcels into contiguous holdings is preferred by farmers and landowners, and this is a major concern of Government.

Any re-parceling program should supplement market-driven consolidation through buying and leasing of land by private entrepreneurs, not replace it. As with fragmentation of farm size, fragmentation of parcels can also be addressed through land markets, with farmers exchanging parcels, or buying or leasing land from one another, in order to create one or two larger, contiguous plots from multiple, small, dispersed plots. It is important to stress, however, that re-parceling should be carried out on a strictly voluntary basis in accordance with clear market principles. Any government-sponsored or other external intervention would only be needed to the extent that land markets are unable to operate efficiently due to constraints under existing conditions that result in prohibitively high transaction costs. These constraints could be alleviated, and market-based transactions to reduce fragmentation of parcels facilitated, by an organized re-parceling program. It is recommended that this sort of re-parceling of land—as opposed to "consolidation" into larger farms—be attempted first through small-scale pilots in order to test the approach in the context of Moldova and gauge the impact and interest. It is important to emphasize that no large-scale national program should be launched, and no changes with regard to consolidation be made to the existing Land Code, until the pilots have been implemented and thoroughly evaluated. Otherwise, it will not be possible to learn from the experience of the pilots, and their purpose will have been defeated.

There is a good basis for the implementation of land re-parceling pilots in Moldova. There is a significant international body of land re-parceling experience to draw upon, both in the West and in the East. In Western European countries, including Denmark, Germany and Holland, land re-parceling has been applied for some time and has proven to be a successful instrument in the land management toolbox. More recently, the countries of Eastern Europe and the CIS have begun a second wave of land reform using re-parceling (for example, Lithuania, Latvia, Bulgaria, and more recently Armenia). Moldova has a good basis for implementing similar projects since, as a result of the first phase of land reform, operational procedures for updating of land registers have been established, the privatization process has been successfully implemented, and land markets are developing. Indeed, there is already experience with implementation of land consolidation/re-parceling projects in Moldova through the USAID-funded Land Privatization Support Project (LPSP) and the government-operated Planning Institute for Land Management. These efforts developed simplified procedures for registration and implementation of land transactions, and demonstrated the significant demand for land re-parceling by Moldovan landowners. They also proved that land re-parceling is possible under the current Land Code. Therefore, implementation of land re-parceling pilot projects under the present circumstances is relevant and feasible. However, it is our assessment that the efforts to date have neglected the interests of individual family farmers, in favor of large investors. Further, none of the consolidation activities so far are part of a clearly defined government strategy, and they lack sustainability.

In response, we have proposed a new concept for land consolidation pilot projects in Moldova. As part of the Moldova Agricultural Land Policy Note, a Background Report that develops the concept for land re-parceling pilots was prepared at the request of the Government of Moldova. This report was prepared by a group of Danish land consolidation specialists under contract with the World Bank, and was presented separately at the July 2005 land consolidation conference in Chisinau sponsored by MAFI and USAID/DAI. The objective of the Background Report is to analyze the current situation in

Moldovan land markets and land management practices, and give practical recommendations on goals, procedures and best modern practices for land re-parceling. A more detailed overview of the report's recommendations is presented in Chapter 4, and the Background Report is also available. The design of the proposed land consolidation pilots will be finalized and presented in a Pilot Program Design Report after receiving feedback from stakeholders including Government, farmers, NGOs, and donors.

The proposal is to begin with pilots in order to test the approach in the Moldovan context and demonstrate the results to the various stakeholders. The proposed approach to land re-parceling is characterized as a process delivering improvements in location, ownership and land use that exceed what individuals can accomplish in bi-lateral exchange of land with each other. Land re-parceling provides an organizational input that handles simultaneously a larger volume of transactions, in a shorter amount of time and for a lower cost than would be possible for individuals. The approach is founded on the principles of voluntary participation and the use of land markets, and should in principle facilitate further development of land markets. The pilot projects in land re-parceling have the small peasant/private family farms as the principal target group. This constitutes a difference in priority from previous land re-parceling activities in Moldova that tended to reflect the initiative and agenda of the stronger actors in the land market, typically as large investors. Of crucial importance for the pilots will be the inclusion of a strong monitoring and evaluation component. This will increase the ability to convince other government agencies or donors who may consider funding the implementation of scaled-up land re-parceling projects in the future, and farmers who may consider participating, of the potential benefits.

Land re-parceling has the potential to yield significant benefits for Moldova, but should be considered as just one specific tool to address one potential challenge out of many facing the agricultural sector. Land re-parceling is only useful to the extent that it facilitates the efficient functioning of land markets. But even this is not enough. Evidence from other countries has shown that land markets are adversely affected by imperfections in input, product and credit markets, and, as is shown in other policy notes in this series, these problems are definitely evident in Moldova. In fact, households surveyed for this study responded that they lease agricultural land out rather than farming it themselves not due to land-related issues, but primarily due to poorly functioning agricultural markets. Evidence presented in the Agricultural Markets Policy Note demonstrates that prices received by Moldovan farmers for their products are indeed significantly lower than what they should be when compared to international prices. This is reducing the profitability of agriculture and decreasing the incentive and ability of farmers to make investments, including in the purchase of land. In today's economy, market competitiveness (particularly in exports) is a more important indicator of success than production. Therefore, land re-parceling should be thought of as only one aspect of a coordinated strategy for development of the agricultural sector, which should also include addressing the problems in the other markets mentioned, as well as improving government services and investment for the sector.

The Status of Land Reform in Moldova

OBJECTIVES AND SCOPE

This note is part of a series of three policy notes prepared by the World Bank to advise the new Moldovan Government and inform World Bank decision-makers on agricultural policies for economic growth and poverty reduction in key areas:

- **Public Expenditures**
- **Markets**
- **Land**

The inter-relationships between the three topics, the importance of the agricultural sector to economy-wide growth and poverty reduction, and the main challenges facing the sector were highlighted in the agriculture chapter of the 2005 Moldova Country Economic Memorandum.

The objective of this policy note on land is to assist the Government of Moldova in improving the effectiveness of land management in agriculture, with a view to enhancing the sector's contribution to Moldova's economic growth and poverty reduction objectives. The note reviews the progress that has been made to date on land reform in Moldova, and provides rigorous economic analysis of the impacts of the reforms and the state of land markets today. It also makes recommendations on options for improving the functioning of land markets.

This note is organized as follows. In Chapter 1 we explore in detail the progress of land reform, including changes in land ownership and land use since 1990; we then describe the results of farm reorganization efforts, including some comparisons with farm structure in market economies (as represented by the EU-15). In Chapter 2 we examine the impacts of land reform on economic indicators such as productivity for different farm types. In Chapter 3 we analyze the development of land markets to date based on new information gathered for this work from the Cadastre Agency, a survey of farms carried out for this study, and other sources. In Chapter 4 we provide recommendations based on international best practice for increasing the efficiency of land use by improving the functioning of land markets, including practical advice for implementing pilot land re-parceling projects.

LAND REFORM HAS LARGELY BEEN SUCCESSFULLY COMPLETED

Land reform in Moldova as in all former Soviet republics involved the transfer of land from state to private ownership, followed by allocation of individual entitlements to land. During the Soviet era all agricultural land in Moldova was state-owned (including the "private" household plots cultivated by the rural population). The principles of land reform were developed and formulated while Moldova was still a Soviet republic, but the implementation of these principles was made feasible only with the adoption of the new Land Code and the Law on Peasant Farms (December 1991–January 1992). The Land Code set out the mechanisms for the privatization of land, while the Law on Peasant Farms provided the legal tools for the establishment of individual private farms through the process of exits from collective farm enterprises.

Despite a slow start, the pace of land reform accelerated after 1996 and was successfully completed. Although reforms began early in Moldova, the government and parliament lacked political resolve to forcefully follow through on them. As a result, administrative support for land privatization and farm restructuring was relatively weak at the beginning of reform in 1992, and the managers of former

collective and state farms were reluctant participants in the process of change. The reforms came to a virtual standstill in late 1994 with the passage of laws which imposed additional bureaucratic and technical constraints to the process, and Moldovan agriculture retained many of the inherited Soviet-era structures. The pace of reforms accelerated again only after the intervention of the Constitutional Court, which led to the removal of legislative constraints in February 1996. The court ruling provided an impetus for significant, fundamental changes in the organization of the agricultural sector. The National Land Program (NLP) launched in 1997 with USAID support focused on the assignment of individual titles to land plots carved out from the large collective fields and distribution of collective non-land assets after first resolving the issue of outstanding farm debt. Moldova today is unique among the Commonwealth of Independent States (CIS) countries in its comprehensive approach to land reform, which has combined the processes of land and property distribution with a radical procedure for resolution of the farm debt overhang without resorting to courts.[4] As of January 2004, some 12 years after the beginning of land reform, fully two-thirds of agricultural land is formally classified in private ownership (**see Figure 1.1**). The rest is owned by the state and the municipalities.

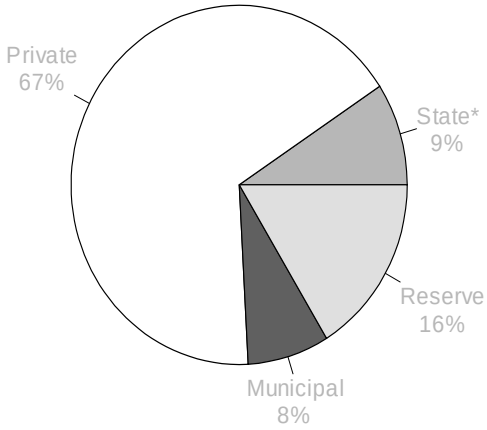

Figure 1.1. Structure of agricultural land ownership in Moldova (January 2004).
Source: State Cadastre; total agricultural land 2.5 million ha.
Note: The segment labeled "State" represents state-owned land allocated to agricultural users (both state and private).

But the successes of land reform have not been fully matched by progress with individualization of agriculture. Largely through the NLP initiative, two dimensions of the land reform process in Moldova are essentially completed: first, the distribution of certificates of entitlement to the rural population (formal land privatization); and second, the allocation of physical plots to individuals (actual privatization). However, reform is also supposed to involve the restructuring of traditional large-scale enterprises into market-oriented farming units. Although Moldova has also achieved progress in this third dimension of reform, the share of large corporate farms remains much larger than in market economies (**see Box 1** for a detailed explanation of terminology).

Box 1: A Note on Terminology

[4] For a discussion of farm debt resolution in Moldova see C. Csaki, Z. Lerman, and S. Sotnikov, *Farm Debt in the CIS: A Multi-Country Study of the Major Causes and Proposed Solutions*, World Bank Discussion Paper 424, World Bank, Washington, DC (2001), pp. 81-113.

The terminology for agriculture in transition is as fluid as the transition itself. Here we try to systematize the terminology used in this study, which largely follows the conventions that are being gradually adopted in the literature.

The term **private** is used to characterize ownership in the legal sense of the word. "Private land" is the opposite of "state-owned land". It includes land owned by "private" individuals and also land owned by private corporate farms, i.e., all farms that are not state farms. In this sense, **privatization** is transfer of land ownership from the state to private individuals and private corporations. **Privatization of land ownership does not necessarily lead to individual farming**. The process that transfers land to individual use is termed **individualization**.

The farm structure is dichotomized by organizational form into individual farms and corporate farms. Individual farms are roughly equivalent to family farms in market economies. In these farms, the farmer (the head of household or the head of family) is both the owner and the manager. Individual farms rely largely on family labor, which is supplemented by hired help as needed. They use mainly own land, which may be supplemented by leased land in growth-oriented farms. In transition economies, the individual farm sector is further subdivided into very small household plots and somewhat larger **"peasant farms"**, which are akin to the family farms common in the west. In this study we always make it clear when individual farms include both household plots and peasant farms and when the discussion of the individual sector is limited to peasant farms only.

Corporate farms are legal bodies, corporations in the standard sense of the word. They are also called "farm enterprises" or "farming organizations" – terms inherited from Soviet statistics. Corporate farms come in a variety of organizational subforms, which are specified in the Civil Code and in the Law of Enterprises and Entrepreneurship. They are subdivided by ownership into private corporate farms and state owned enterprises. The main organizational forms among private corporate farms are partnerships, limited liability companies, joint-stock (shareholding) societies, and agricultural production cooperatives. These organizational forms are usually referred to as "new corporate forms" because they did not exist under Soviet legislation and began to emerge only after 1991. Traditional corporate forms include state farms as well as kolkhozes – collective farms inherited from the Soviet era. Legally, kolkhozes are private corporate farms because they are owned by the members of the collective, not by the state. Traditional corporate farms still exist in Moldova, but their role in agriculture has shrunk from total dominance to almost nil.

Corporate farms are owned by shareholders and managed by hired professional managers. In transition countries, including Moldova, the shareholders are typically the local village residents who were formerly members of the local collective farm and received shares in its land and assets. In principle, outside investors may also purchase shares in corporate farms. Corporate farms rely on hired labor. Some of the workers may be shareholders, but they receive a wage for their work, like all hired workers. All shareholders are entitled to dividends from the corporate farm. An important feature of farm restructuring introduced after 1997 is that the new units are not committed to continue employing all the members who have formerly worked on the land assigned to the unit (i.e., the original shareholders). The new units can shed member labor, as long as they continue paying dividends to shareholders or rent to the owners of land that they cultivate.

Next, a few words concerning the terms **fragmentation and consolidation**, which are at the center of the ongoing policy debate in Moldova. These terms are used in two basically different senses (although consolidation is always the opposite of fragmentation). **Fragmentation can refer to either fragmentation of parcels or fragmentation of farm size**. **Fragmentation of parcels reflects the fact that the land used by a farm is split into several parcels in different locations.** The process of land privatization in Moldova, because of its equity-driven design, produced fragmentation of land parcels: each individual received on average 0.6 hectares of agricultural land divided into three parcels (a parcel of arable land, a parcel of orchards, and a parcel of vineyards). This is fragmentation of land parcels, and in this sense consolidation would involve exchanging original parcels for contiguous parcels (which could involve, for example, giving up some vineyards and acquiring more arable land instead).

Fragmentation of farm size reflects the existence of a large number of very small farms. In Moldova today, the land use structure is fragmented in both senses. There is a huge proportion of very small farms, and each of these farms is split into three or four parcels. Our examination of fragmentation of farm size has led to another dichotomization of farms in the empirical part of this study. **In parallel with the organizational-form dichotomy (individual vs. corporate farms), we use a dichotomy based on farm size: small farms (up to 10-50 hectares) and large farms** (in principle more than 50 hectares, but in practice more than 100 hectares). There is considerable overlap between the organizational-form dichotomy and the farm-size dichotomy in Moldova, and they are often used interchangeably as proxies for one another. Yet the two dichotomies are not identical. Individual farms are

typically small farms, but some individual farms fall in the large-size category. Corporate farms are typically large, but some fall in the small-size category.

Finally, there is a distinction between land ownership and land use. Land ownership is a tenure status conveyed to an individual or corporation through legal registration, typically for an unlimited period of time. Land use refers to the area actually exploited by a farmer or farm enterprise. It could include land that is owned, as well as land that is rented in, borrowed, or accessed through some other means. It is the area actually exploited for agricultural production by a farm unit.

Box 2: A Note on Data Sources

The data used in this study are based on official statistics and on various farm surveys conducted since 1997.

Official statistics:
Statistical yearbooks of Moldova (Department of Statistics)
Agriculture in Moldova 2004 (Department of Statistics)
Agricultural Activity of Households and Farms – Results of the Statistical Survey, 2002 and 2003 (Department of Statistics)
Land balance tables (State Cadastre Agency)

Farm surveys:
World Bank/ARA survey of farm managers and households (Lerman, Moroz, Csaki), 1997
World Bank baseline survey – preparation of Moldova Agricultural Strategy (Lerman, Moroz, Izman, Kim), 2000
World Bank survey – cross-country study of reform impacts (Dudwick, Fock, Sedik, Moroz), 2003
USAID/PFAP surveys of peasant farms and farm enterprises (Muravschi, Bucatca), 2003
World Bank leasing survey—a new survey of leasing relationships carried out for this study, 2005

Accuracy and consistency of the peasant farm statistics available for Moldova leave much to be desired, and create challenges for anyone trying to analyze farms toward the smaller end of the spectrum. For example, official figures on the number of peasant farms vary widely, form 283,200 to 558,000, while figures on the total area of peasant farms vary from 526,000 to 750,000 hectares. For purposes of farm size distribution comparisons we have to rely on data provided by various surveys conducted in Moldova since 2000, as official Moldovan statistics do not include information on distribution of farm sizes.

The deficiencies of the official leasing statistics usually force us to rely on survey data for the analysis of land leasing. The World Bank conducted several comprehensive rural surveys in Moldova (1997, 2000, and 2003), which were designed to cover a wide range of reform-related topics and included inter alia certain aspects of agricultural land leasing. To bring the information on land leasing (and land markets in general) up to date, a new specialized survey was conducted for this study in May 2005, focusing on transactions in agricultural land and on issues of equity in relations between lessors (typically small landowners) and lessees (commercially oriented peasant farms and large corporate farms). The survey was carried out in collaboration with the World Bank's ECA Regional study on land lease markets.

The WB 2005 survey covered two major groups of respondents: small rural landowners, representing the supply side of agricultural land markets; commercially oriented peasant farms and large corporate farms, representing the demand side of agricultural land markets ("land users"). The survey instruments naturally allowed for the possibility that landowners were also land users in the sense that they farmed at least some of their land, and that peasant farms and corporate farms, in turn, owned some land and could therefore contribute to the supply side of agricultural land markets. The "land users" were selected on the basis of village-level lists, covering all peasant farms and corporate farms in the area. The "landowners" were selected from among the rural households in the village not listed as peasant farmers.

Improve the quality, coverage and availability of official agricultural data to better inform decision-making.

A study such as this should primarily rely on official statistical data. It is only in the absence of official data that we should have to turn to various surveys for additional information and insights. Moldovan agricultural statistics, in the form that is available to the public, was unfortunately judged to be inadequate for our purposes, which explains our heavy reliance on private survey data. Moreover, it proved difficult to access additional information currently collected by government agencies such as the Department of Statistics but not included in typical official publications (which only provide summary data). The lack of information makes it difficult to answer the pressing questions that are of greatest interest to the Government of Moldova with regard to agricultural policy, such as the impacts of fragmentation. The professional experts in the Department of Statistics, MAFI and other government agencies are recommended to review this report in order to identify the data gaps that should be filled in official statistics.

CHANGES IN LAND OWNERSHIP AND LAND USE SINCE 1990

Privatization has resulted in fairly dramatic shifts of resources from state to private farms, and ongoing reallocation of land between different private forms. The structure of land tenure has undergone a dramatic change since 1990 (**see Figure 1.2 and Table 1.1)**. The state farms, which controlled over 90% of agricultural land (including old "corporate" forms like collectives; **see Box 1**) practically disappeared during the previous decade, as almost all of them received ownership of their land from the state. Actual "privatization" of land (in other words, transfer of land to non-state ownership) has stabilized since 1996 (the date of the landmark resolution of the Constitutional Court). The State as the "residual claimant" in the process of privatization retains ownership of 33% of agricultural land, and this figure has not changed markedly since creation of the reserve fund in 1994-95[5] (**see Table 1.1 and Figure 1.1**). Meanwhile, between 1996-2003 over 700,000 ha (nearly 30% of all agricultural land) moved out of the corporate farm sector and into the individual sector, and specifically to the subsector of peasant farms, which increased their total land holdings almost ten-fold since 1995 (**see Figure 1.2**). Further reduction of state-owned land will have to come through distribution of reserve lands to individuals.

Private ownership does not mean individual use of land. Since January 2001 the individual sector (individual peasant farms and household plots) has managed over 40% of agricultural land in Moldova, double its share in 1997, and the corporate farm sector has lost its former dominance (**see Figure 1.2**). However, as **Figure 1.3** shows (**compare to Figure 1.1**), half of privately owned land continues to be managed by large-scale corporate farms, which are basically corporate shareholder structures with joint, not individual, cultivation of land (new corporate forms like joint stock societies, agricultural production cooperatives, limited liability companies, etc.). In addition, state farms rebounded from almost zero in 2001 to control 9% of agricultural land.[6] The ownership structure (private vs. state) differs from the structure of land use because farms (mainly in the individual sector) also cultivate land owned by the state and the municipalities (in addition to privately owned land). Thus, two-thirds of the municipally owned land is in fact allocated to household plots for family farming (as well as home construction) and only one-third is retained for municipal uses.

[5] The state land reserve established in 1994 was intended to provide a pool of land for redistribution and future uses. The reserve was created by extracting a certain proportion of the land managed by corporate farms, and the first phase of contraction of state land ownership (1990-94) was entirely attributable to this process (see also **Figure 1.3**).

[6] This "rebound" is the result of a large conversion in 2001 of corporate land previously classified as privately owned into state ownership. Nearly 200,000 hectares of privately owned land managed by corporate farms was reclassified as state-owned land. This process is reminiscent of the conversion of collective into state farms frequently practiced during the Soviet era, but we do not have information on the exact reasons for this reclassification. State farms today are mainly seed and livestock selection centers, experimental stations, and educational facilities: they do not engage in large-scale commercial production as in the past.

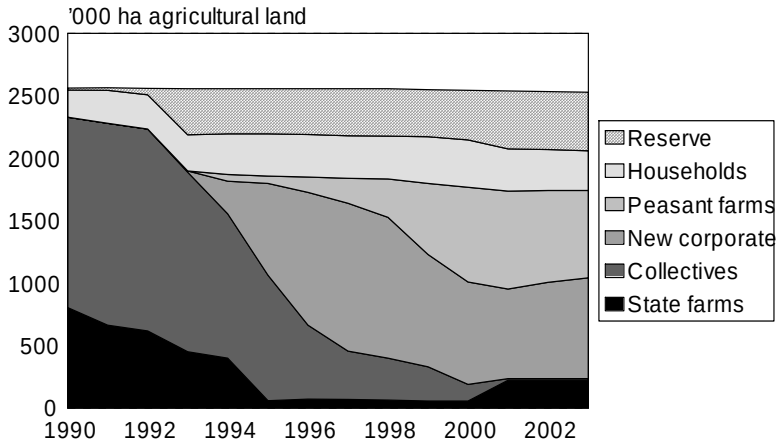

Figure 1.2. Structure of agricultural land use in Moldova 1990-2003.
Source: State Cadastre; transposed to end of year.

Table 1.1. Structure of Land Use 1990-2003 (end of year data, percent of agricultural land)*

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
State sector	**32.1**	**26.7**	**26.2**	**32.2**	**29.8**	**16.4**	**17.1**	**17.4**	**17.4**	**17.0**	**17.8**	**27.0**	**27.2**	**27.4**
State farms	31.4	26.0	24.2	17.7	15.7	2.4	2.9	2.7	2.5	2.2	2.2	8.8	8.8	8.9
Reserve land	0.6	0.7	0.6	13.2	13.8	13.9	14.1	14.5	14.6	14.6	15.4	16.7	16.6	16.4
Other state users	0.0	0.0	1.3	1.3	0.3	0.2	0.2	0.2	0.2	0.1	0.2	1.5	1.7	2.1
Corporate forms	**59.5**	**63.0**	**63.0**	**56.5**	**55.4**	**68.0**	**64.7**	**61.4**	**57.2**	**46.0**	**37.5**	**28.8**	**31.0**	**32.5**
Collectives	59.5	63.0	63.0	56.1	45.2	39.3	23.1	15.1	13.2	10.8	5.3	0.5	0.5	0.5
New corporate forms	0.0	0.0	0.0	0.4	10.3	28.7	41.6	46.2	44.0	35.3	32.2	28.2	30.4	31.9
Individual sector	**8.5**	**10.3**	**10.8**	**11.3**	**14.8**	**15.6**	**18.1**	**21.2**	**25.5**	**37.0**	**44.7**	**44.2**	**41.9**	**40.1**
Peasant farms	--	--	0.0	0.0	2.1	2.4	4.8	7.8	12.0	22.3	29.8	30.9	28.9	27.6
Household plots	8.5	10.3	10.8	11.3	12.7	13.2	13.4	13.4	13.4	14.7	14.9	13.3	12.9	12.5
Total agricultural land	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
'000 ha	2562.2	2563.6	2559.6	2557.3	2556.7	2556.3	2555.5	2555.7	2556.6	2550.3	2543.6	2538.7	2533.8	2528.3

*Data include Transnistria.
Source: State Cadastre, land balance tables; transposed to end of year.

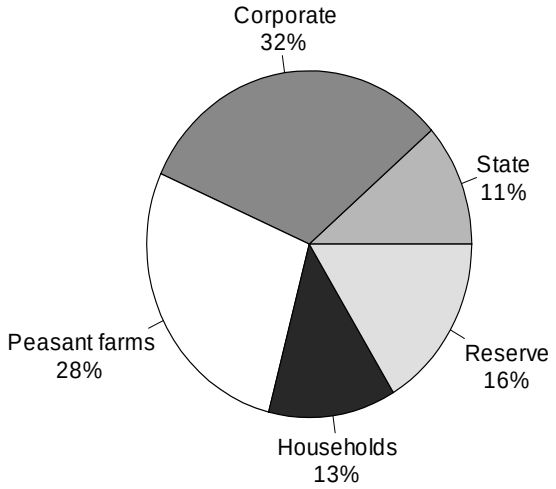

Figure 1.3. Structure of agricultural land use in Moldova (January 2004).
Source: State Cadastre; total agricultural land 2.5 million ha.
Note: State users include state farms, municipal uses, and "old style" collectives (0.5% of land).

THE RESULTS OF FARM REORGANIZATION

Physical allocation of land plots facilitated farm reorganization. Initially, prior to the launch of the National Land Program (NLP), the land and asset shares used in privatization were paper certificates, representing the entitlement of each individual to a portion of total land and total assets of the collective farm. Individuals could elect to keep their shares in the restructured farm or leave the collective enterprise, withdrawing their land and assets in physical form. NLP shifted the emphasis to physical allocation of land and assets to individuals, including legally binding titling of the land plots. It thus simplified and encouraged the various reconfiguring decisions, be it an exit from the old collective as a private farmer, or participation in a new corporate entity with other members.

Many recipients of land plots decided to withdraw their shares, creating a new class of family farmers. There has been a marked acceleration in the creation of new peasant farms since the launch of the National Land Program in 1997-98. As of the end of 2003, some 650,000 holders of land shares, or about two-thirds of all beneficiaries, had withdrawn nearly 900,000 hectares of agricultural land from large-scale collectives (**see Table 1.2**). The growth of land withdrawals between 1991 and 2003 is shown in **Figure 1.4**. An individual who withdraws a plot of land from a former collective in principle becomes an independent "peasant" (or family) farmer. In reality, there are about 300,000 officially registered peasant farms in Moldova today with slightly over 500,000 hectares of agricultural land, which gives an average individual farm size of approximately 1.9 hectares.[7] Limited information from another source on the size distribution of peasant farms is available for the three years 2001-2003 only. This information is summarized in **Table 1.3**. About 80% of peasant farm land is in farms smaller than 50 hectares on average (and almost as high a share is in farms smaller than 10 hectares). The rest is controlled by just 300-400 larger peasant farms (out of the total count of 283,200 registered farms).

Table 1.2: Land withdrawal from corporate farms and creation of peasant farms (cumulative)

	1999	2000	2001	2002	2003
Number of people allocated physical plots against land shares, '000	429.0	502.7	565.8	617.0	645.3
Total land allocated against land shares, '000 ha	590.8	701.8	805.4	836.6	867.9
Number of registered peasant farms, '000	131.6	201.5	248.3	268.4	283.2
Total land in registered peasant farms, '000 ha	285.4	364.1	448.5	513.6	526.0
Average size of peasant farm, ha	2.17	1.81	1.81	1.91	1.86
Ratio of land in registered peasant farms to allocated land	0.48	0.52	0.56	0.61	0.61
Ratio of the number of registered peasant farmers to number of people allocated land	0.31	0.40	0.44	0.44	0.44

Source: *Agriculture in Moldova 2004*, Table 5.1, p. 120; data transposed to end of year.

[7] There is unfortunately no precise quantitative information on these processes and official sources give widely conflicting numbers on the area of agricultural land in peasant farms. In *Agriculture in Moldova 2004*, one table (p. 120) gives 526,000 hectares in 283,200 registered peasant farms, while another table on the next page gives 706,700 hectares (34% more) in an unspecified number of peasant farms (presumably both registered and unregistered). Another official source (*Agricultural Activity of Households and Farms in the Republic of Moldova*, 2003 issue) gives an even larger figure for land in peasant farms (around 750,000 hectares). Cadastral data summarized in Table 1.1 correspond to 700,000 hectares in 558,000 peasant farms, which implies an average farm size of 1.3 hectares.

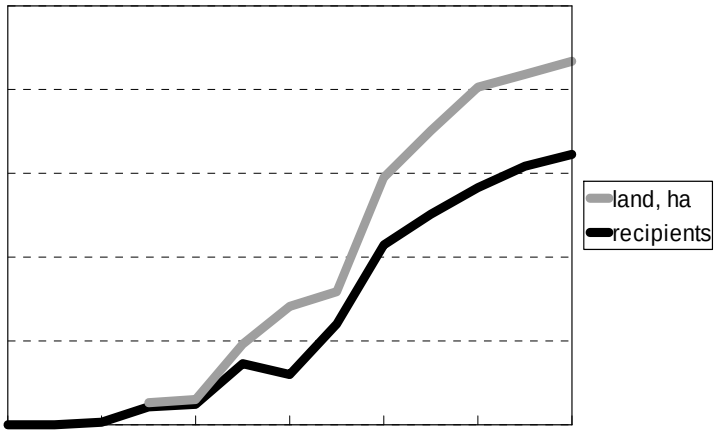

Figure 1.4: The potential for peasant farms: allocation of land against land shares 1991-2003. Source: 1991-1998 from State Cadastre land balances; 1999-2003 from *Agriculture in Moldova 2004*, Table 5.1, p. 120

Table 1.3: Share of land in peasant farms smaller than 50 and 10 hectares

	2001	2002	2003
Agricultural land in peasant farms, '000 ha	791.7	796.5	743.5
% of land in farms smaller than 50 ha	81.9	75.7	81.7
% of land in farms smaller than 10 ha	n.a.	74.7	80.8

Source: *Agricultural Activity of Households and Farms in the Republic of Moldova,* 2002 and 2003 issues.

A significant share of land remains in new corporate farms. Out of more than one million beneficiaries of the privatization process, about 700,000 decided not to switch to independent farming. These shareholders entrusted their shares to "leaders," enterprising persons who are willing to manage the land and assets of a whole group of individuals. While some of these "leaders" are truly new rural entrepreneurs, many others are former managers of traditional collective farms. The "leaders" today manage about 1,500 large-scale farms registered as new corporate forms, mostly (78%) as limited liability companies, but also joint-stock societies, agricultural cooperatives, and farmers associations. The traditional "corporate" forms – collective and state farms – have all but disappeared. However, the 50% of agricultural land controlled by corporate structures remains much higher than what is typical for market economies, where corporate farms tend to control around 2% of agricultural land or less. A full census of different large-farm organizational forms in Moldova is presented in **Table 1.4**.

Table 1.4: Large-Farm Reorganization

	Number of units as of Jan. 2004	Number of units in 1991
Traditional forms:		
State farms	75	389
Collective farms	4	600
Interfarm cooperatives	7	96
New forms:		
Joint stock societies	95	-
Limited liability companies	1,188	-
Agricultural cooperatives	111	-
Farmers associations	44	-
Total large-scale forms	**1,527**	**1,085**
Agricultural land, '000 ha	**994**	**2,274**
Average size, ha	**650**	**2,096**

Source: Land balance tables, State Cadastre Agency.

Although today's corporate farms are new in the legal sense, they are not necessarily new in terms of their manner of operation. These organizational forms simply did not exist in the Soviet legislation. They were introduced into Moldovan "company law" in January 1992 by the Law on Entrepreneurship and Enterprises and subsequently entered the Civil Code. It is by no means certain however that they are also "new" in terms of their genesis and management style. Many of these "new" corporate farms have been created by straightforward reorganization (and sometimes simply mechanical re-registration) of former traditional collectives. Others are "splinters" of a former collective that divided into two or three smaller components in the process of reform. There have been no studies of the comparative performance of the new corporate farms and the traditional collectives in Moldova.

Today's corporate farms are, however, smaller on average than the older large-farm forms. Prior to 1990, the farm structure in Moldova, as throughout all parts of the Soviet Union, was characterized by extreme duality, with very large collective and state farms at the upper end of the distribution and very small household plots at the other extreme. The changes since 1990 have substantially reduced the size of the large corporate farms (**see Table 1.4**), while the household plots have practically doubled in size and a new category of medium-sized peasant farms has emerged to smooth out the formerly sharp dual structure. The average corporate farm today manages 650 hectares, compared with 2,100 hectares in 1991. In total, farms larger than 1,000 hectares now manage less than 20% of agricultural land, whereas 35% of land has shifted to a new category of medium-sized corporate farms with up to 500 ha (**Figure 1.5**).

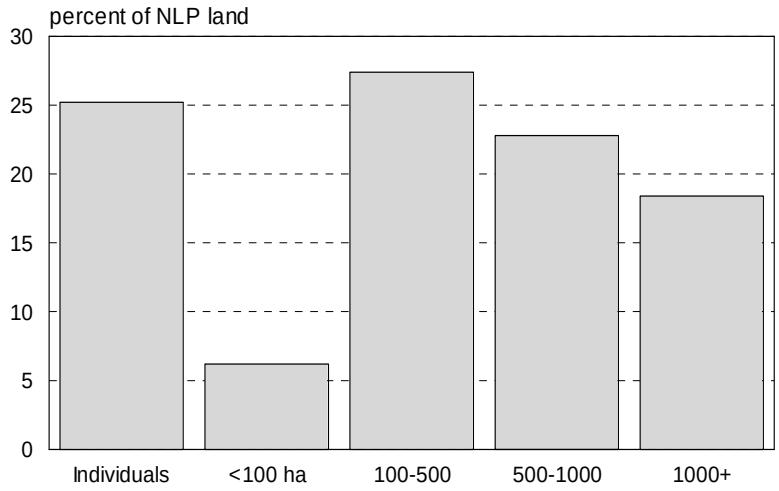

Figure 1.5: Distribution of land in "leader-managed" new corporate farms: September 2000. Source: Unpublished performance report, NLP, Chisinau 2001.

FARM REORGANIZATION IS NOT COMPLETE

The average size of individual farms in Moldova does not appear too small compared with similar agricultural economies in the EU. There is no one optimal farm size for all countries. Instead, it is a product of natural endowments such as availability of arable land and rural population density, which vary by country. In this sense, the relatively densely populated and land-poor Europe is a much more appropriate comparison for Moldova than North America, with its sparsely populated huge expanses of agricultural land (similar to Russia). In fact, the average farm in the EU-15 is not much larger than the average peasant farm in Moldova, while it is much smaller than the average corporate farm in Moldova. In the EU-15 taken as a group, the average farm size is 18.7 hectares, but 58% of the farms have less than 5 hectares (2000 data). Considered country by country, the EU-15 show considerable variability in average farm sizes (**Table 1.5**). In three of the 15 countries (Greece, Italy, and Portugal) the average farm size is less than 10 hectares; in five other countries the average size is between 10 and 30 hectares; in six countries it is between 30 and 50 hectares; and only one country (UK) has farms with nearly 70 hectares on average. Within Europe, the relevant comparison for Moldova is Greece, Italy, and Portugal due to similar endowments, not the UK or France. Given these benchmarks, the average size of individual farms in Moldova does not appear too small.

Table 1.5: Average farm size in EU-15 in 2000

	Hectares
EU-15 (weighted mean)	18.7
Greece	4.4
Italy	6.1
Portugal	9.3
Austria	17.0
Netherlands	20.0
Spain	20.3
Belgium	22.6
Finland	27.3
Ireland	31.4
Germany	36.3
Sweden	37.7
France	42.0
Luxembourg	45.4
Denmark	45.7
UK	67.7
Unweighted mean for EU-15	**28.9**

Source: *Agriculture in the European Union: Statistical and Economic Information 2002*, EU Directorate-General for Agriculture (February 2003).

The overall distribution of agricultural land in Moldova remains quite concentrated. The sharp difference in average sizes between individual and corporate farms is reflected in fairly strong concentration of land in the largest farms in Moldova. The Lorenz curve provides a standard tool for visualizing inequality of land distribution between large and small farms. Plotting the cumulative percent of the number of farms (from smallest to largest) on the horizontal axis and the cumulative percent of agricultural land used by farms on the vertical axis, we obtain a curve whose downward bulge below the diagonal provides a measure of inequality or concentration. The Lorenz curve for Moldova is shown in **Figure 1.6**, where we see that 70% of the smallest farms (mostly individual farms) account for just under 1% of land holdings (i.e., land use) while the remaining 30% of larger farms (corporate farms plus a substantial number of relatively large individual farms) account for 99% of land holdings. In the EU-15, 10% of the largest farms control 64% of agricultural land compared with as much as 73% in Moldova. Further, in the EU-15 80% of the smallest farms control 17.5% of agricultural land compared with only 6.4% in Moldova.

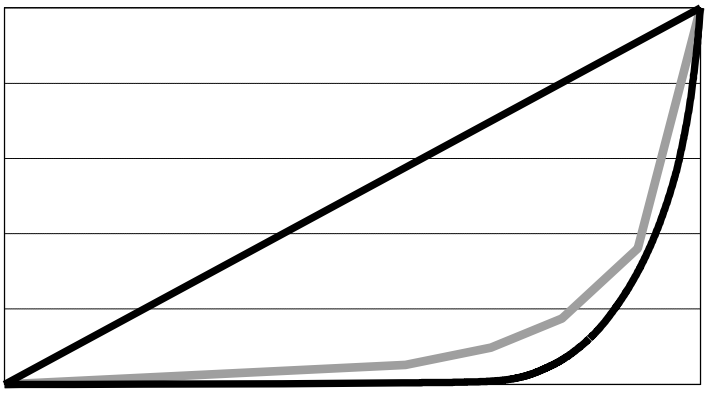

Figure 1.6: Land concentration curves for Moldova (2003) and EU-15 (2000). Source: Moldova based on three 2003 surveys; EU-15 see Table 3.2. In the absence of a country-wide size distribution for all farms in Moldova, we produced a "sample" Lorenz curve ordering by size the farms in all three 2003 surveys (the WB 2003 surveys and two PFAP surveys, n = 1885).

To move closer to the market pattern, Moldova has to undergo further farm size adjustment. The observed results for Moldova fall somewhere between the market model and the former Soviet model: the land concentration is not as extreme as in Russia and Ukraine, which are still very close to the former Soviet model characterized by sharply dual farm structure, but it is substantially more pronounced than in the EU (and also than in the US and Canada). Our analysis clearly demonstrates that continued progress toward the market pattern of farm sizes in Moldova would require further significant downsizing of the large corporate farms and further transfer of land to small individual farms. In other words, to have a farm structure more like that of the EU, Moldova needs to move to the left in **Figure 1.6**, which means more land in the hands of small farmers.

The Economic Impacts of Land Reform

In this section we present empirical evidence to show that **small individual farms achieve higher productivity and efficiency than large corporate farms**. Fragmentation of holdings due to land privatization and the advisability of implementing administrative measures to encourage consolidation and re-creation of large-scale corporate farms are at the center of the ongoing policy debate in Moldova. To address these issues in a comprehensive manner, we carried out productivity analysis on several data sets. First, we use official national-level statistics to calculate partial and total productivity measures of individual and corporate farms. Then we analyze four surveys carried out by the World Bank and PFAP (USAID Private Farmers Assistance Program) in 2000 and 2003, where the data can be dichotomized by farm size (small vs. large farms). For the most part in Moldova, corporate farms are large farms, whereas individual farms (including peasant farms and household plots) are small farms. The organizational form dichotomy in the national-level analysis is therefore a good proxy for the farm-size dichotomy in the analysis of the surveys. The different datasets all consistently show that the productivity and efficiency of small individual farms is significantly higher than the productivity of large corporate farms.

COMPARISONS OF PRODUCTIVE EFFICIENCY BY FARM TYPE

As of 2003, the individual sector, with about 50% of total agricultural land, produces more than 70% of agricultural output and more than 75% of agricultural employment. As we have seen, the continuing shift of agricultural land from corporate to individual farms has produced a dramatic change in the structure of land use by agricultural producers. Since 1999-2000, the agricultural land resources are evenly divided between corporate and individual farms (including peasant farms and household plots), with each sector controlling about 50% of the total (excluding reserve land; **see Table 2.1**). The significant changes in land use have naturally affected the production structure of agriculture. While the output of large collective and corporate farms declined through a complex combination of factors that included loss of land and disruption of the old economic order, the output of the individual sector has been growing (**Figure 2.1**). In 1998, the individual sector overtook the collective and corporate sector by value of production. Meanwhile, the total number of employed in agriculture (including hired labor, members of cooperatives and shareholder farms, and self-employed) remained fairly stable at 700,000-750,000 between 1990 and 2002 (**Table 2.1**).[8] Yet, while the agricultural labor in corporate farms decreased precipitously, especially between 1995 and 2001, that in individual farms increased sharply, especially after 1996, following the influx of agricultural land into the individual sector (**Figure 2.2**). The opposite employment trends in corporate and individual farms have resulted in a sharp increase of the share of agricultural labor in the individual sector – from 25% in the early 1990s to more than 75% in 2000-2003.

Table 2.1. Land, output, and labor by farm type 1990-2003

	Agricultural land used by farms*			Gross Agricultural Output			Employed in agriculture		
	'000 ha	Corporate, %	Individual, %	Million lei, 2000 prices	Corporate, %	Individual, %	'000 workers	Corporate, %	Individual, %
1990	2545.8	91.5	8.5	17757	79.6	20.4	678	83.2	16.8
1991	2544.9	89.6	10.4	15749	76.3	23.7	743	75.8	24.2
1992	2509.5	89.0	11.0	13311	70.6	29.4	749	74.1	25.9
1993	2187.3	86.8	13.2	14647	62.5	37.5	730	73.1	26.9
1994	2196.6	82.7	17.3	11086	58.1	41.9	767	69.6	30.4
1995	2196.4	81.9	18.1	10293	55.5	44.5	771	69.2	30.8
1996	2191.3	78.9	21.1	9071	53.8	46.2	711	67.4	32.6
1997	2181.2	75.1	24.9	10108	54.4	45.6	684	63.2	36.8
1998	2177.8	70.1	29.9	8935	42.8	57.2	750	48.5	51.5
1999	2173.8	56.6	43.4	8184	32.8	67.2	731	33.8	66.2
2000	2146.7	47.1	52.9	7917	29.0	71.0	766	23.1	76.9
2001	2076.0	46.0	54.0	8427	28.0	72.0	764	20.7	79.3
2002	2069.2	48.7	51.3	8717	29.0	71.0	747	20.6	79.4
2003	2059.8	50.7	49.3	7535	25.0	75.0	583	23.9	76.1

*End of year data; land used by farms is agricultural land excluding the areas not allocated to agricultural producers (the state reserve, miscellaneous state lands, and part of the municipal land not allocated to agricultural producers). Individual farms include both peasant farms and household plots.
Source: National-level time-series data from official statistical publications (Statistical Yearbook of Moldova for various years and Agriculture in Moldova 2004).

[8] The reported number of employed in agriculture dropped by more than 20% in 2003, but the reasons for this are not yet clear and may be purely technical.

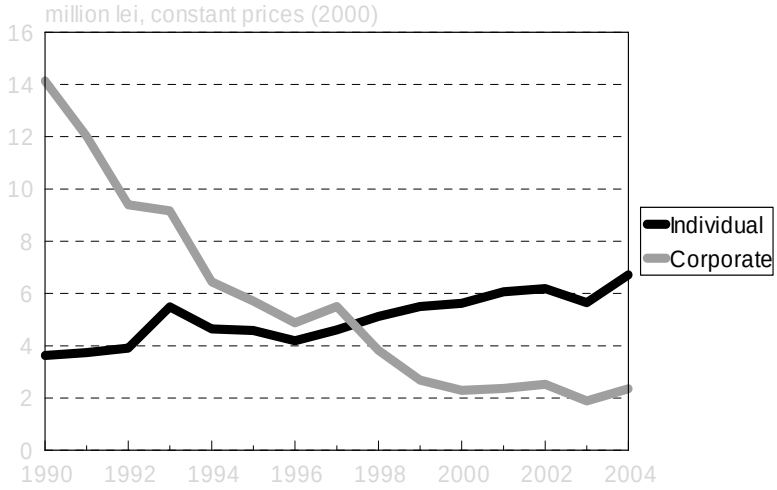

Figure 2.1: Gross agricultural product for individual and corporate farms 1990-2004.
Source: Statistical Yearbooks of Moldova 1999, 2004.

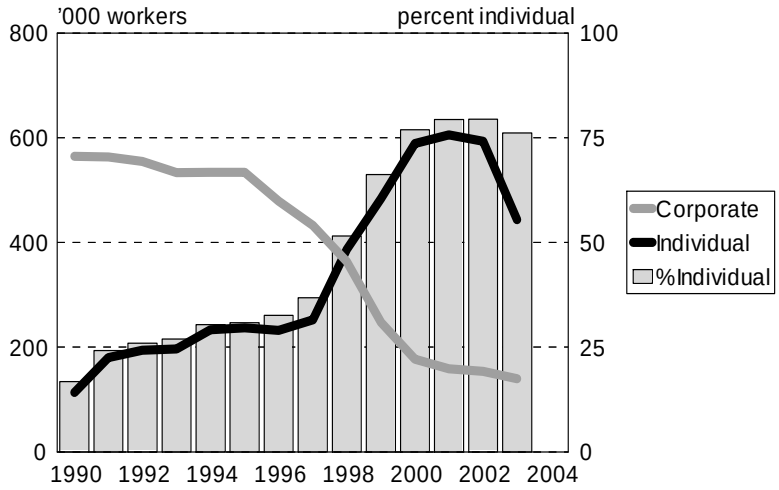

Figure 2.2: Agricultural employment in individual and corporate farms: thousands of workers (solid curves) and share of individual farms in total employment (bars).
Source: Department of Statistics; number of employed in individual farms calculated as the difference between total number of employed and number of employed in corporate farms.

Land productivity is definitely higher for individual farms, while the results for labor productivity are ambiguous. Given the value of agricultural output in constant 2000 lei (**Table 2.1**), we can calculate the partial productivity of land and labor in absolute terms at the national level. The results are presented in **Table 2.2** and in **Figures 2.3 and 2.4**. One of the features that clearly emerge is the general decline of agricultural productivity since 1990 for farms of all types. The ongoing reforms have not produced significant productivity improvements after the initial shock. However, despite the similar trends, the productivity of individual farms is generally higher than the productivity of corporate farms.

The land productivity of individual farms is higher in each and every year between 1990 and 2003. The labor productivity is higher in 11 of the 14 years: the exception is the period 2000-2002, when the labor productivity of corporate farms increased due to signs of increasing output combined with continuing decrease of labor in these years. In other transition countries we also observe that the productivity of land is higher for individual farms, but that the productivity of labor is higher for corporate farms. Thus, the two partial productivity measures for land and labor do not give a consistent picture.

Table 2.2: Land and labor productivity for corporate and individual farms

	Productivity of land, '000 lei/ha		Productivity of labor, '000 lei/worker	
Year	Corporate	Individual	Corporate	Individual
1990	6.1	16.8	25.0	32.0
1991	5.3	14.2	21.3	20.8
1992	4.2	14.2	16.9	20.2
1993	4.8	18.9	17.2	27.9
1994	3.5	12.2	12.1	19.9
1995	3.2	11.5	10.7	19.3
1996	2.8	9.0	10.2	18.1
1997	3.4	8.5	12.7	18.3
1998	2.5	7.9	10.5	13.2
1999	2.2	5.8	10.9	11.4
2000	2.3	4.9	13.0	9.5
2001	2.5	5.4	14.9	10.0
2002	2.5	5.8	16.5	10.4
2003	1.8	5.5	13.5	12.7
Ave 1990-2003	3.4*	10.1*	14.7	17.4
Ave 1990-1996	4.3*	13.8*	16.2*	22.6*
Ave 1997-2003	2.4*	6.3*	13.1	12.2

*The differences between corporate and individual farms significant at $p < 0.1$ by both parametric and non-parametric tests. While the land productivity of individual farms is statistically significantly higher than that of corporate farms, the difference in labor productivity, is not statistically significant, although the mean for the entire period 1990-2003 is higher for individual farms.
Source: Calculated from Table 4.1.

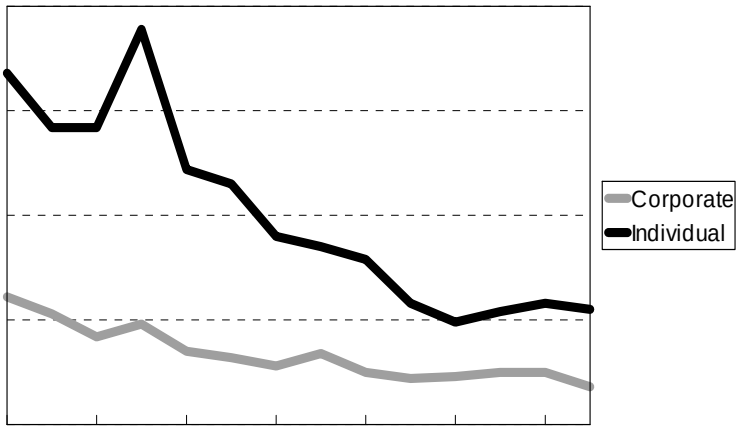

Figure 2.3: Land productivity for individual and corporate farms 1990-2003 (absolute values in constant 2000 prices).
Source: Author's calculations (Table 4.1).

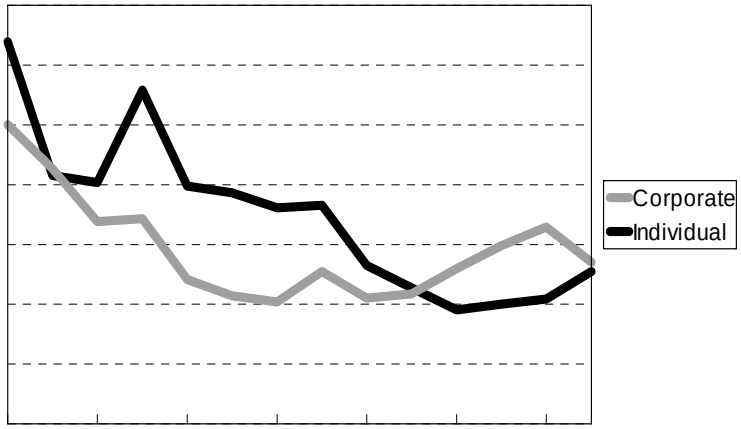

Figure 2.4: Agricultural labor productivity for individual and corporate farms 1990-2003 (absolute values in constant 2000 prices).
Source: Author's calculations (Table 4.1).

Total Factor Productivity calculations demonstrate conclusively that small farms are more efficient than large farms. Partial productivity measures such as those presented above reflect the use of a single input (land or labor) taken separately. They often present an ambiguous picture, as some farms may have a higher productivity of land (say) and a lower productivity of labor. The ambiguity is resolved by switching from partial productivity to total factor productivity (TFP), which takes into account the value of output that can be produced using both land and labor inputs combined. Details of these calculations are presented in the **Annex on Total Factor Productivity Calculations**. We calculated TFP for different groups of farms using several different data sets. The mean TFP values obtained by this method for small and large farms in the four survey samples are presented in **Table 2.3** and **Figure 2.4**.

They demonstrate that small individual farms attain consistently higher TFPs than large corporate farms.[9] The TFP calculations thus eliminate the ambiguity between the partial productivities of land and labor for large and small farms and conclusively show that small farms use their resources more productively than large farms.[10] The results also demonstrate decreasing returns to scale.

Table 2.3: TFP (lei per aggregated unit of inputs)

	Small (individual) farms	Large (corporate) farms	Large-to-small ratio
WB 2003 survey	6,426	4,745	0.74
PFAP surveys	7,424	3,464	0.47
WB 2000 survey	8,420	4,010	0.48

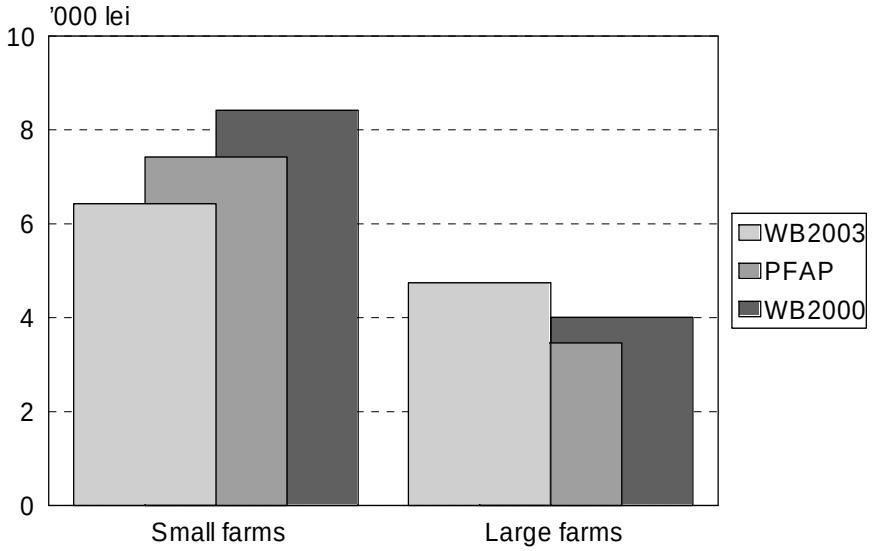

Figure 2.4: Total factor productivity for farms of different types.
Source: Based on two World Bank surveys (2000, 2003) and two PFAP surveys (2003).

BUILDING ON LAND REFORM

Moldovan agriculture is better off today than it would have been without land reform. The national-level database for Moldova contains information on the value of agricultural output (in constant 2000 lei) and the quantities of two main inputs: agricultural land and agricultural labor. These data are available for 14 years 1990-2003 for individual and corporate farms separately. To get a qualitative picture of TFP changes over time, we conducted a simulation using this data with a model based on the results of the estimates for the smaller databases above.[11] **Figure 2.5** presents the TFP results over time.

[9] The differences are statistically significant at $p = 0.1$.

[10] Our results for the relative TFP of corporate and individual farms are not too far from the result of Dudwick, Fock, and Sedik (World Bank, February 2005), who calculate the TFP as the ratio of the value of output to the accounting value of total costs. The TFP of corporate farms in Dudwick et al. (Table 5) is 30% of the TFP for individual farms, whereas our results give around 45% (by dummy variable analysis for the WB 2003 sample and by input aggregation for the pooled sample).

[11] We assumed a conventional Cobb-Douglas production function with factor shares of 0.7 for land and 0.3 for labor. Additional details are provided in the annex.

The TFP for individual farms is higher than for corporate farms over the entire period 1990-2003, with means of 11.5 for individual farms and 4.4 for corporate farms.[12] Although productivity growth in Moldovan agriculture still lags behind the CIS average (and is far below the CEE average), it has begun to recover (**see Figure 2.6**). The productivity recovery in Moldova is attributable to the intensification of land reform after the introduction of NLP, which resulted in the transfer of land resources from less efficient corporate farms to more efficient individual farms. It is clear, therefore, that the concerns about land reform retarding agricultural growth through the creation of small, individual farms are misplaced, and any effort to reverse these reforms would be counterproductive.

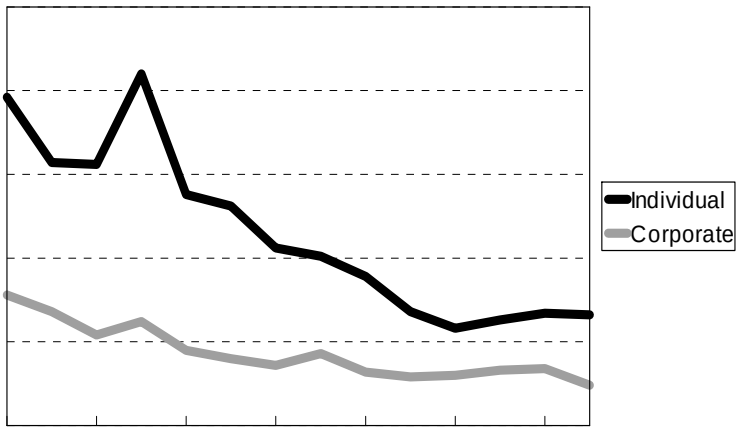

Figure 2.5: Total factor productivity for individual and corporate farms 1990-2003 (inputs from Table 4.1 aggregated using hypothetical factor shares of 0.7 to land and 0.3 to labor).

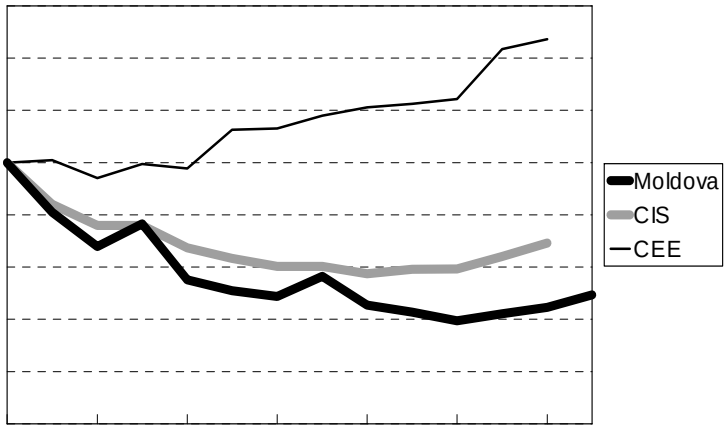

Figure 2.6: Agricultural labor productivity for Moldova, CIS, and CEE (index numbers, percent of 1990). Source: Calculations based on Table 4.2 for Moldova, *Official Statistics of CIS Countries*, CD-ROM 2004-9 for CIS, and official country statistics from statistical yearbooks for CEE.

These results are consistent with those found elsewhere in the world. A recent comprehensive analysis by the International Food Policy Research Institute (IFPRI) found that small, family-run farms

[12] The difference is statistically significant.

have advantages that allow them to dominate over other farm types.[13] These advantages include lower labor-related transaction costs and more family workers per hectare, which increase the quality of labor inputs. Such characteristics are especially important in the production of high-value, labor-intensive fruit and vegetable crops in which Moldova is fortunate to have a comparative advantage (see the Moldova Agricultural Markets Policy Note and CEM). The IFPRI study also found that for a country to achieve widespread poverty reduction, it normally must provide three things: (i) higher employment for the poor, (ii) higher unskilled wage rates, and (iii) greater access to low-cost food staples. Productivity growth in small family farming alone has the potential to raise all three. Our findings that TFP is higher for small farms and that TFP decreases with increasing farm size are also reinforced by recent results for U.S. farms.[14] Using a time series of labor and capital in U.S. farms for 1978-1996, researchers have found that an increase of farm size reduces, rather than increases, agricultural productivity (as measured by TFP). In fact, nearly a century of research by agricultural economists around the world has resulted in a stylized fact: small, family farmers generally use resource such as land, labor and capital more efficiently than large, corporate farms that depend primarily on hired labor.[15] This has also been show to hold in other CIS countries during the transition.[16]

Organizational form is probably a more important determinant of performance than farm size. So far we have looked at datasets with two clearly differentiated groups of farms: small individual farms (generally farms with less than 50 hectares) and large corporate farms (technically farms with more than 50 hectares, but in practice managing hundreds and thousands of hectares on average). Given this dichotomy, we obtained evidence of decreasing returns to scale and clear proof of higher total factor productivity in small individual farms. The PFAP database taken on its own (without pooling with the WB 2003 survey) provides 512 observations of large corporate farms only. The coefficients of the production function estimated for this sample sum to more than 1 (0.81 for land and 0.31 for labor)[17], and therefore demonstrate *increasing* returns to scale. This result is consistent with previous findings for corporate farms in Russia, where several researchers have observed increasing returns to scale specifically among corporate farms (Uzun, 2005; Epshtein, 2003, 2005). The different behavior for the homogeneous sample of corporate farms may be understood if we recall that in our samples scale is a proxy for farm type. Small farms are typically individual farms, and they do better than large corporate farms not necessarily because of a size effect, but because of an organizational form effect: individual family farms outperform corporate farms.

The main message is that Moldova should continue to build on reforms by creating a level playing field in which the most efficient farms are allowed to prosper. In general, this is likely to mean that land would continue to flow from large corporate farms to small individual farms, which as we have seen are more efficient (although the optimal size and organizational form will vary somewhat depending on the crop and local ratios of labor to land). This would bring Moldova's farm structure in closer conformity with the pattern of land concentration in market economies. More importantly, it will increase incentives to invest in agriculture because individual farms do a better job of this than corporate—and especially cooperative—structures. It will also increase rural employment because smaller family farms tend to be more labor intensive. At the same time this may correct, at least partially,

[13] Lipton, M. (2005), *The Family Farm in a Globalizing World*, IFPRI 2020 Discussion Paper 40.

[14] Ahearn, M., J. Yee and W. Huffman, "The Effect of Contracting and Consolidation on Farm Productivity," paper presented at the Economics of Contracting in Agriculture Workshop, Annapolis, MD (July 2002).

[15] van den Brink, R., G. Thomas and H. Binswanger, "Agricultural Land Redistribution in South Africa: Towards Accelerated Implementation," World Bank technical paper, (June 2005).

[16] Lerman, Z., C. Csaki and G. Feder, *Agriculture in Transition: Land Policies and Evlolving Farm Structure in Post-Soviet Countries*, Lexington Books, Lanham MD (2004).

[17] The difference from 1 is statistically significant at $p = 0.01$.

one of the two manifestations of land fragmentation in Moldova: the average size of the very small individual farms will increase somewhat as they acquire more land at the expense of large corporate farms. This process can be facilitated by the efficient functioning of land markets.

The Status of Land Markets

Titling and registration of ownership rights in a state cadastre is generally a prerequisite for normal functioning of land markets as it provides security for land transactions. The cadastre system in Moldova was set up in 1998-99 with extensive donor support in conjunction with the NLP. The progress achieved with cadastral registration of agricultural land since 2000 is illustrated in **Figure 3.1**.[18] The number of registered agricultural plots increased from about 1 million in 2000 to 3.2 million in 2004. The cumulative registered area grew from 600,000 hectares to 2.8 million hectares, and it now seems that virtually all agricultural and household plots have been registered in the cadastre.

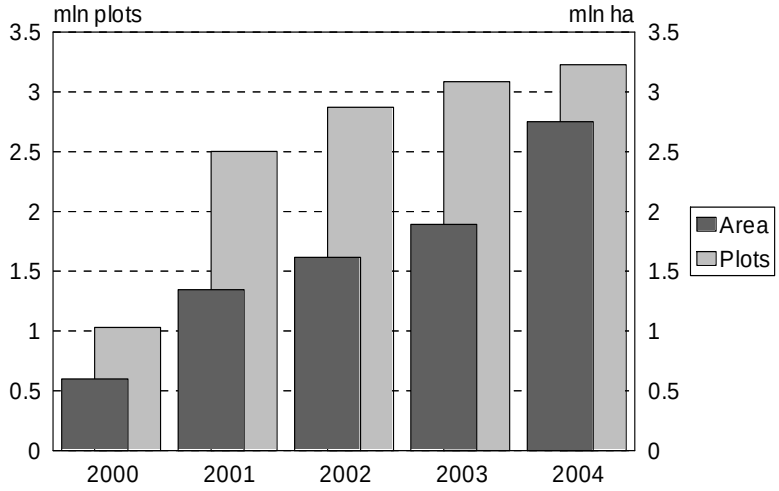

Figure 3.1: Progress with cadastral registration of agricultural land 2000-2004.

The agricultural land market in Moldova began to emerge as an immediate outcome of the changes introduced by the NLP, and has been growing ever since. The total number of transactions in agricultural land increased rapidly from virtually zero in 1999 to about 130,000 in 2003-2004 (**see Figure 3.2**). During the 5-year period 2000-2004, the Cadastre Agency reports nearly 400,000 agricultural land transactions, and by the end of 2005 the cumulative number of transactions is expected to exceed 550,000. Of the total number of recorded transactions, 36% involve buying and selling of land, 13% are leasing transactions, and the remaining 51% are transactions involving inheritance and gifts (the share of transactions of different types has remained fairly constant over time since 2001). The relatively small

[18] The State Cadastre Agency is the only source of information on agricultural land transactions, including buying-and-selling and lease contracts. However, neither the Cadastre Agency nor the First Cadastre Project distributes this information openly to the public: they do not have a web site and they do not publish statistical collections. We are working with the technical staff of the Cadastre Project with the objective of collecting authoritative and up-to-date information on the number of land transactions, the volume of agricultural land transacted annually, and land prices achieved. While this work is in process, we have relied on two alternative sources: (a) tables with summaries of the number of transactions by year (from 1999 to 2004) kindly provided by Mr. Valeriu Ginju, the head of the First Cadastre Project; (b) the baseline study of the agricultural land market in Moldova carried out by the Consulting and Credit in Agriculture (CCA) NGO (November 2003) and kindly made available to us by Mr. Valery Chodsky of DAI/USAID in Chisinau.

share of leasing transactions reported likely arises because only lease contracts for a term of 3 years or longer are subject to registration in the regional cadastre office, in addition to the possibility of under-reporting. In contrast, individual farm surveys conducted by the Department of Statistics indicate that 57% of respondents leased their entire land to other users, and many among the remaining 43% leased out at least part of their land.[19] Local experts estimate that at least 70% of all lease contracts in Moldova are for a term shorter than 3 years. This means that the actual number of lease contracts can be estimated at 185,000, or one-third of all land transactions in Moldova during 1999-2005. The transacted area also increased sharply with the number of transactions (**see Table 3.1**). The total area changing ownership during the period 1999-2005 is 13% of all agricultural land or 18% of all privately owned agricultural land in the country. To put this in perspective, we need to estimate transfer rates: the ratio of the number of titles transferred per year to the total number of titles in the cadastral registry. The transfer rate in Moldova has been 2.5%-3% in recent years. This is substantially lower than the EU average of 7%, but it is comparable to transition countries like Hungary (2.5% in 1998), and is higher than the transfer rates in a number of other CEE countries (around 1% for the Czech Republic, Slovakia, Latvia, Poland, and Slovenia in 1998).[20] In other words, land markets in Moldova are developing relatively well.

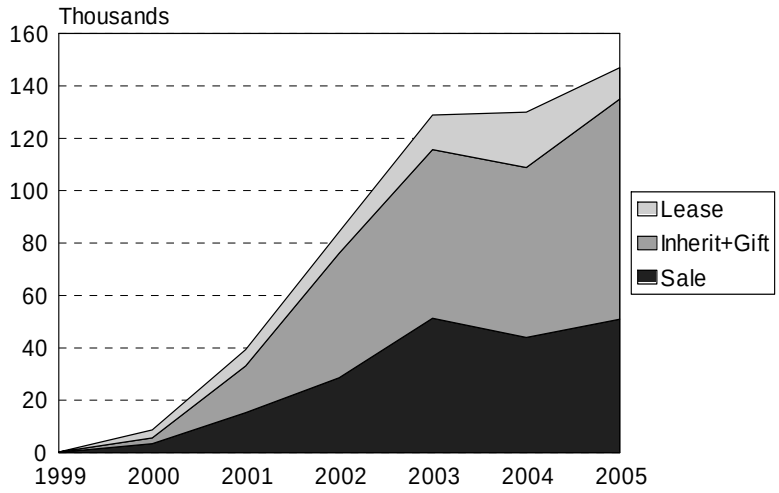

Figure 3.2. Number of transactions in agricultural land 1999-2005.
Note: Lease transactions only include officially registered transactions for terms over 3 years.
Source: First Cadastre Project; data for 2005 extrapolated to a full year.

Table 3.1: Transacted area of agricultural land 1999-2005 (excluding leasing)

	Transacted area, ha			Percent of total		Average transaction, ha		
	Sale	Other ownership transfers	Total	Sale	Other ownership transfers	Sale	Other ownership transfers	Total
1999	74	28	102	73	27	0.68	0.48	0.57
2000	1879	1364	3243	58	42	0.61	0.61	0.61
2001	9,238	14,201	23,439	39	61	0.62	0.74	0.65

[19] *Agricultural Activity of Households and Farms in the Republic of Moldova in 2003 – Results of the Statistical Survey*, Chisinau, 2004, p. 12.

[20] The international comparisons are constructed from R. Baldwin, *The Development of Land Markets in Central and Eastern Europe*, ACE Project P2128R, Brussels (June 1998). See also Z. Lerman, C. Csaki, and G. Feder, *Agriculture in Transition: Land Policies and Evolving Farm Structures in Post-Soviet Countries*, Lexington Books, Lanham MD (2004), p. 81.

2002	17,599	28,825	46,424	38	62	0.63	0.59	0.61
2003	36,248	47,036	83,284	44	56	0.66	0.68	0.67
2004	53,818	40,421	94,239	57	43	1.15	0.58	0.73
2005*	32,363	38,952	71,215	45	55	1.62	0.89	1.06
1999-2005	151,121	170,825	321,946	47	53	0.88	0.68	0.72

Source: First Cadastre Project.
*Preliminary data for January-April 2005.

LAND SALES MARKETS

The increase in average transaction size over time may reflect certain parcel consolidation trends in Moldova. The average land sale transaction recorded in the national cadastre during 1999-2005 was less than 1 hectare (**see Table 3.1**). However, after remaining fairly constant at 0.6-0.7 hectares from 1999-2003, the average transaction size increased significantly to more than 1 hectare in 2004-2005 (**see Figure 3.3**). This is the average size of a parcel recorded as a cadastral object in the system, reflecting the original fragmentation of the land shares in the process of privatization. Each physical transaction by one buyer could involve many such small parcels.

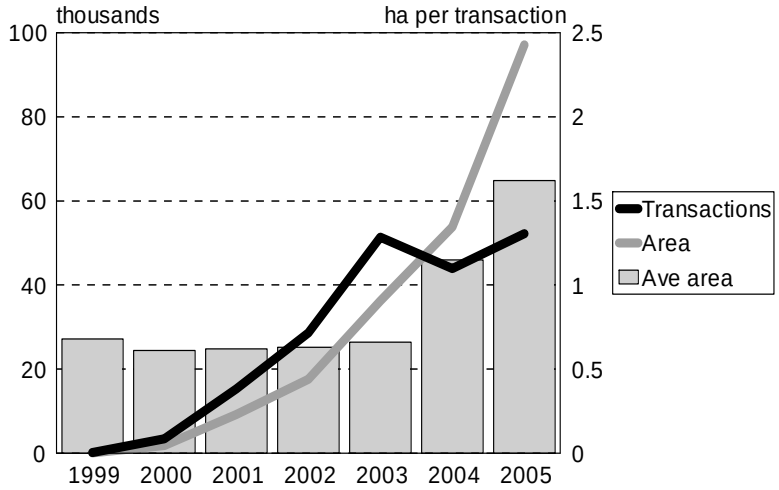

Figure 3.3: Number of land sale transactions (black curve), total transacted area of agricultural land (gray curve), and average area per transaction (bars).
Source: First Cadastre Project; data for 2005 extrapolated to a full year.

Price data show that agricultural land sales markets remain relatively thin. The median price of agricultural land in 2004-05 was 5,400 lei per hectare across 11 territorial cadastre offices excluding the capital Chisinau.[21] The land prices showed considerable regional variation. The median price ranged from less than 3,000 lei per hectare in Soroca (far north) to more than 10,000 lei per hectare in Balti and Comrat (north-center and south, respectively). The price of land within the municipal limits of Chisinau was an order of magnitude higher: 53,000 lei per hectare in 2004-05.[22] It is often conjectured that land prices are inversely related to the distance from the capital. However, **our analysis failed to detect a**

[21] Source: First Cadastre Agency

[22] Although officially this is agricultural land, the higher prices in the capital probably capture expectations of windfall profits from non-farming uses that are expected to become possible through eventual re-zoning.

statistical relationship between prices and distance from the capital once Chisinau itself had been removed from the analysis (**see Figure 3.4**). Another feature that emerges from **Figure 3.4** is the constancy of land prices over time. The random mixing of the points for different years in each cadastre region (i.e., for each distance) shows that there was no systematic increase (or decrease) of real, inflation-adjusted land prices between 2001 and 2005. This probably indicates that **the demand for agricultural land is still low and was not sufficient to drive land prices up over time.** The visual conclusions from **Figure 3.4** are confirmed by regression analysis carried out for this study, which has failed to detect any statistically significant impact of distance and time on real land prices. In a separate set of analyses we did not find a statistically significant association between land prices and land supply factors (as proxied by the number of transactions or the transacted area across the cadastre regions). This finding probably indicates that **at the present stage there is an excess supply of land that is more than sufficient to satisfy the limited demand** at the given prices. For the situation to change, the profitability of farming should be increased, and this will depend primarily on improvements in agricultural product markets (see Moldova Agricultural Markets Policy Note and CEM).

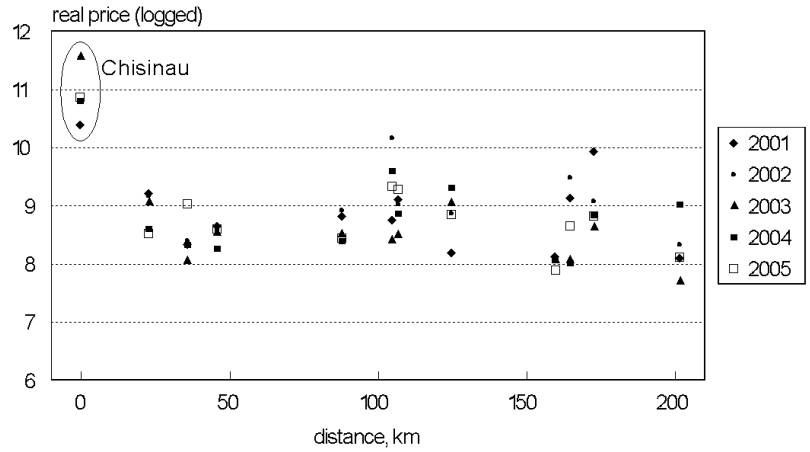

Figure 3.4: Land prices versus distance from Chisinau 2001-2005.
Source: First Cadastre Project.

Development of the land sales market could also be encouraged by reducing transaction costs. We have seen that the average price of agricultural land in Moldova is around 5,000 lei per hectare. Since the average sale transaction recorded in the State Cadastre is 0.9 hectares, purchasing one hectare of agricultural land involves practically one cadastral transaction ("parcel"). Our field visits yielded estimates of 300 lei for the transaction costs associated with registration of transfer of ownership (**Table 3.2**)[23]. This is about 5%-10% of the price of land, which is not at all exorbitant by CIS standards (in Russia, for instance, the transactions costs may exceed the price of land by a large margin[24]). This cost, however, does not include surveying and mapping, which were carried out with USAID funding as part of

[23] For similar estimates see *Agricultural Land Market in Moldova: Baseline Study*, USAID/CCA, Chisinau (November 2003), p. 47.
[24] For a detailed analysis of transaction costs in Russia see N. Shagaida, "Agricultural Land Market in Russia: Living with Constraints," *Comparative Economic Studies*, 47(1): 127-140 (March 2005).

the NLP. Without surveying, the main cost component is the notary fee for authentication of documents. It is charged at 180 lei per transaction and thus accounts for 60% of the total transaction costs. In theory, notary fees are charged pro rata on a sliding downward scale. However, the sliding scale starts at 1.3%, but not less than 180 lei. The minimum fee is 1.3% of 14,000 lei, which is equivalent to a 3-hectare transaction. Since the average transaction is actually 0.9 hectares, if the minimum were eliminated, the notary fee for the average transaction would be 65 lei instead of 180 lei. The practice of charging a flat notary fee on small transactions seems to be universal in CIS and is contrary to the prevailing practice in the United States and the EU. To reduce transaction costs under conditions of Moldova's highly fragmented holdings, **notary fees should be calculated pro rata and the unrealistically high minimum fee should be abolished.**

Table 3.2: Estimated land transaction costs according to the standard procedure and the consolidated option

	Standard procedure	Consolidated procedure
Extract from cadastre registry	25.50	n.a.
Authentication of sales contracts by notary	180.00	25.00
State tax for authentication	15.00	n.a.
New record of ownership	42.50	34.00*
Two trips to cadastre office (one trip to submit the paperwork, second trip to collect new title)	37.00	n.a.
Total	300.00	59.00

*The primaria receives a rebate or a grant of 8.50 lei per title from the government.
Source: Field visit in Jora de Mijloc primaria, Orhei district (February 2005).

Transaction costs could be further reduced in the context of village-wide land re-parceling activities. As mentioned above, each physical transaction by one buyer could involve many small parcels of land. For example, an entrepreneur buying 120 hectares of land would have to register on average 200 transactions to complete the transfer of ownership, resulting in high transaction costs. By adopting a consolidated procedure, whereby the primaria secretary prepares a single list of all parcel sales in the village at a particular time and then travels to the district cadastre office on behalf of all the buyers and sellers, transaction costs could be reduced from the present level of 300 lei to somewhere around 60 lei (**Table 3.2**). The primaria secretary is legally empowered to act as a notary for the local residents, typically charging 25 lei for the services (compared with 180 lei notary fees). Furthermore, with his close knowledge of the local situation, the secretary can authenticate the sales contract without requiring a cadastral extract, thus eliminating another cost component. This procedure is being implemented on an experimental basis in the primaria of Jora de Mijloc (Orhei district) and, if officially approved, it may lead to substantial savings in transaction costs for buyers who are forced to assemble their holdings from a mosaic of small parcels. It could also be argued that it is in the public's interest to support the initial phase of re-parceling through projects that facilitate the process and subsidize the costs at the local level (see the next chapter for more on this).

LAND LEASING MARKETS

Leasing is a practical alternative to buying and selling of land. Leasing is a basic component of land market transactions in all market economies, and it supplements land purchase by providing an additional channel for transfer of land to more efficient users and for adjustment of farm sizes. A new World Bank study on land rental markets has revealed that land leasing is fully consistent with modern agricultural systems, and widespread in developed market economies (in the US for example, commercial

farms rent on average half of the land they use).[25] It is also generally more important for land exchange than sales in European and Central Asian (ECA) countries, and can provide important benefits during the transition to a market economy. The potential benefits of land rental markets include that they:

- Allow more flexible adjustments of the land area used with relatively low transaction costs;
- Require only a limited capital outlay, thereby leaving more liquidity available for productive investments rather than locking it all up in land;
- Facilitate easy reallocation of land toward more efficient users than the current owners; and
- Provide a stepping-stone towards land ownership by the landless.

Due to the deficiencies in official data, we rely on survey data for the analysis of land leasing in Moldova, including a new survey carried out for this study (**see Box 2**). The WB 2005 survey covered two major groups of respondents: small rural household landowners, representing the supply side of agricultural land markets; and commercially oriented peasant farms and large corporate farms, representing the demand side of agricultural land markets. The survey has demonstrated that the distinction between "landowners" and "land users" in rural Moldova is quite sharp. The "landowners" are accordingly referred to as "households" in what follows, while the "land users" are generally divided into peasant farms (an individual or family-based form of commercial organization) and corporate farms.

Land leasing is fulfilling its role as a facilitator of farms size adjustment in Moldova. Survey data shows that peasant farms with leased land are, on average, much larger than farms based only on privately owned land. The size adjustment effect achieved by peasant farms through land leasing is demonstrated in **Table 3.3**. In the WB 2000 survey, all farms—both individual and corporate—relied heavily on land leased from outsiders to increase their size. A very strong correlation[26] was observed between farm size and the amount of leased land: on average, an increase of 1 ha in land holdings was achieved entirely through leasing from outsiders. The markets for land leasing evolved strongly over time: only 6% of peasant farmers reported leasing land in the 1997 survey, but this percentage increased to 28% in the 2005 survey. Although no comprehensive official statistics on lease transactions are available to this day, the land lease market has definitely grown much stronger as leaders of the new corporate farms join private farmers in competing for additional land among inactive landowners.[27]

Table 3.3: Size of peasant farms with and without leased land

	WB 1997		WB 2003		WB 2005	
	Farms w/out leased land	Farms with leased land	Farms w/out leased land	Farms with leased land	Farms w/out leased land	Farms with leased land
Percent of farms	94	6	79	21	72	28
Total land use	2.8	16.9	3.8	11.6	3.7	9.5
Private land	2.8	3.4	3.8	3.1	3.7	5.0
Leased land	--	13.5	--	8.5	--	4.5

Source: World Bank surveys, 1997, 2003, and 2005.

[25] Swinnen, J. and L. Vranken (2005), *Agricultural Land Rental Markets in Europe and Central Asia: Developments, Constraints, and Implications*, Draft Report for the World Bank, University of Leuven.

[26] R^2=0.85, $p < 0.001$

[27] As noted earlier, only lease contracts for a term of 3 years or longer are subject to registration in the regional cadastre office. Yet, even with this restriction on data availability, the number of lease transactions recorded in the State Cadastre increased from around 3,000 to more than 21,000 between the years 2000 and 2004.

There is a sharp dichotomy between household plots on the supply side and commercial producers (peasant farms and corporate farms) as agents of demand in land rental markets. Based on the findings of the WB 2005 survey, the average household in the sample owns 2.7 hectares of agricultural land, but actually farms less than 0.5 hectares, or only 18% of the total endowment. The farmed portion is the traditional household plot (0.13 hectares around the house and 0.32 hectares in the fields outside the village, typically split into two parcels). The remaining 2.2 hectares represent land shares received in the process of privatization, and practically all household lease all this land to commercial operators (**see Table 3.4**). While all households lease out land, not a single household reported leasing in land to augment the family holdings. No households reported buying or selling land in the last three years either. Households lease the bulk of their land to corporate farms, which account for 90% of all land leased by the households in the WB 2005 survey. The remaining 10% is leased to peasant farms.[28] Looking at it from the demand side, peasant and corporate farms lease in land mainly from households. Some land is leased internally (from farm members or shareholders), but fully 70% is leased from outsiders (**Table 3.4**). The remainder was leased from local authorities. Consistent with the observed role of peasant farms as primarily lessees, they provided only 12% of the land leased by corporate farms.

Table 3.4: Land leasing: who to and who from (percent of leased land)

	Lessors: supply side		Lessees: demand side	
	Households	Peasant farms	Peasant farms	Corporate farms
Farm members/shareholders	--	--	33	12
Households	--	--	67	70
Peasant farms	10	--	--	12
Corporate farms	90	100	--	--
Others	--	--	--	6
Leased land, ha (mean per farm)	2.2	0.3	1.3	1006

Source: WB 2005 survey.

Land use is less fragmented than land ownership, and land use is more relevant for agricultural production and efficiency. The role of rural households as the suppliers of land in the agricultural sector emerges clearly when we analyze the structure of holdings of the other two cohorts in the WB 2005 survey – peasant farms and corporate farms. In farms of both these types, owned land is only a portion of used land (contrary to household plots, which use only a small fraction of owned land), and the difference is made up by leasing in land from outside sources (**see Table 3.5**). The reliance on leased land is particularly pronounced for corporate farms, where the component of owned land is very small (1%). Thus, analyzing farm fragmentation solely on the basis of land ownership can be very misleading, as it does not account for the de facto consolidation that is taking place through leasing.

Table 3.5: Structure of land holdings in farms of different types (in percent of land used)

	Households		Peasant farms		Corporate farms	
	Area, ha	Structure of land use, %	Area, ha	Structure of land use, %	Area, ha	Structure of land use, %
Total owned	2.7	540	5.7	85	14	1
Leased in	0.0	0	1.3	19	1006	100
Leased out	2.2	440	0.3	4	12	1
Total used	0.5	100	6.7	100	1008	100

Source: WB 2005 survey.

[28] This is very close to the results of the WB 2000 survey, where 86% of households' leased land went to corporate farms and 11% to peasant farms.

Households want to farm. The 2005 survey suggests that the existing situation – whereby rural families generally farm their small household plot and lease out their land shares to other producers – is not really what the people want. Asked about the optimal size of their farm, 50% of the respondents gave a desired size of 1.0 hectare, 25% indicated that they would like to farm more than 3.0 hectares, and 10% set the optimal farm size at 5.0 hectares or larger (**see Table 3.6**). Compared to currently farmed land (about 0.5 hectares), the median augmentation desired by the households is more than a factor of 3, with 25% of respondents seeking to augment their current plot size by a factor of 7.5 or more.[29] Currently owned land (about 2.7 hectares), on the other hand, appears to be quite sufficient to meet the desired augmentation for more than half the households. We are thus faced with an intriguing puzzle: people own enough land to meet their farming target, and yet they lease out the bulk of this land and keep a plot which is much smaller than the desired target.

Table 3.6: Desired augmentation of farm size as reported by households*

	Mean	Median	Upper quartile
Land used	0.46	0.44	0.55
Land owned	2.66	2.20	3.38
"Optimal" farm size	2.86	1.00	3.00
Percent used	0.23	0.18	0.26
Augmentation factor			
relative to land used	7.1	3.3	7.7
relative to land owned	1.3	0.8	1.0

*For respondents reporting nonzero "optimal" size (n = 73).
Source: WB 2005 survey.

Households choose to lease out land not because of fragmentation, but due to poorly functioning markets. According to the WB 2005 survey, the main motivation for households to lease land out is constraints in the labor market—specifically, insufficient labor (40% of respondents in the WB 2005 survey). Difficulties with access to purchased inputs and credit (or money in general) rank next. In aggregate, reasons associated with the functioning of normal (non-land) markets are cited by 89% of the households as responsible for their decision to lease out land, while physical land constraints are only cited by 4% of respondents (**see Table 3.7**). It could be argued that the individuals who cite markets as the main reason for renting out their land would farm the land on their own instead if the missing or distorted markets were corrected. This view is supported by the observation that the desired augmentation factors are substantially greater for respondents who attribute leasing out to market imperfections than for respondents who lease out because of physical land constraints. Imperfections in markets are dealt with in detail in the Agricultural Markets Policy Note. Meanwhile, there is a small group of respondents (7%) who classify themselves as "passive co-owners" or "shareholders". They are institutionally obliged to lease their land shares to the corporate farm (the "leader"), but they are not entirely happy with the arrangement that leaves them with a very small plot to farm. For these respondents the median augmentation factor is much higher than for the two other groups, indicating the possible existence of external pressures applied to landowners by "leaders" of corporate farms.

[29] The augmentation factors for lessees are much more moderate: the respective medians are 1.7 for peasant farms and 1.2 for corporate farms (relative to land used).

Table 3.7: Reasons to lease out land and relationship with augmentation factor for households

	Percent of lessors	Category of reasons	Percent of lessors	Median augmentation factor	
				Relative to land used	Relative to land owned
Plot too far from house	1				
Plot too small	3	Physical	4	1.0	0.2
Land of poor quality	0				
Farming not profitable	11				
Inputs not available	19				
No money	15	Market	89	4.7	0.8
Insufficient labor	40				
No marketing channels	3				
Obliged to lease as member/shareholder	7	Institutional	7	50.0	7.3

Source: WB 2005 survey.

Lease payments have a significant impact on the standard of living of rural households, although they are generally worse off than peasant farmers. Lease payments account for fully 12% of total family income in households surveyed. In peasant farms they make a much smaller contribution, because farmers lease out land to a much smaller extent than households. **Table 3.8** shows the structure of family income for households and peasant farms in the survey. To assess the contribution of land leasing to overall family well-being for rural households, we analyzed the relationship between lease payments and the family standard of living as perceived by respondents to the WB 2005 survey. The respondents classified their standard of living on a four-level scale: below subsistence (family income not sufficient to buy food); subsistence level (family income sufficient to buy food and daily necessities); comfortable level (family income sufficient to buy clothing and other consumer goods above and beyond daily necessities); satisfied level (no material difficulties). **Figure 3.5** demonstrates that overall peasant farmers enjoy a higher standard of living than rural households in the survey. Among households, lease payments accounted for 20% of income in families reporting a comfortable standard of living and only 9.5% in families on the sub-subsistence level. Thus, any policy that would remove the possibility of rural households to earn income from leasing out land without providing a viable alternative would reduce their welfare. One potential alternative would be to increase the number of peasant farms by creating an environment that would allow willing and able households to profitably farm on larger plots.

Table 6.8: Structure of family income for households and peasant farmers in the survey (in percent)

	Households	Peasant farmers
Farm income (including value of consumption of own products)	29	64
Salary income	28	10
Income from non-farm activities	14	21
Pensions and social transfers	17	3
Lease payments and dividends	12	2
Total family income	100	100

Source: WB 2005 survey.

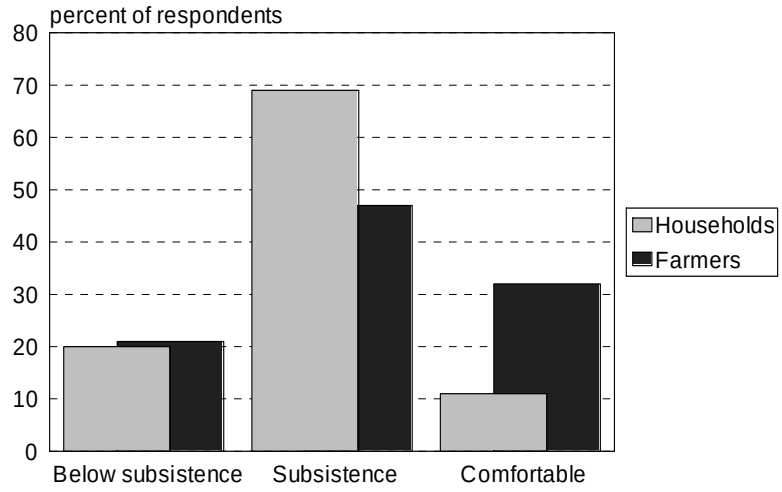

Figure 3.5: Perceived standard of living for rural households and peasant farmers. Source: WB 2005 survey.

Lessees often do not honor their obligations to lessors, and this limits the potential impact on rural households' welfare. Leasing out of land shares by households is generally formalized by a contract with a legal entity (representing the corporate farm). This mode is reported by 80% of the households in the WB 2005 survey, while only 8% have signed a lease contract with the manager as an individual. Investment of land shares in the equity capital of corporate farms is not reported by any of the households. While land leasing is mostly covered by formal contracts, the situation with asset shares is different: nearly 40% of asset share owners indicate that their shares are used by the corporate farm without their formal consent (the rest have formal or informal contracts). But even where formal contracts exist, lessees do not always honor their obligations. Fully 17% of respondent households did not receive any of the payments that were due under the lease contracts and 45% received only partial payment. The lessees discharged their contractual obligations in full for only 37% of respondents. Among those who received some lease payments, two-thirds were paid in kind and one-third was paid in cash and in kind. Cash-only lease payments are not normally practiced.

Give more land to individual farmers if you want them to live better. Curiously, no statistically significant relationship was observed between the standard of living and farm size for the households surveyed. This is in sharp contrast to the findings in other transition countries. For peasant farmers, on the other hand, a comfortable standard of living is associated with a much larger farm size than the lower standards of living. The relationship between standard of living and farm size is illustrated in **Figure 3.6**. Here the probability of being in the highest standard of living (gray curve) increases with farm size, while the probability of being in the lowest sub-subsistence or "poverty" level (thick black curve) sharply decreases with farm size.[30] Peasant farms reporting a comfortable standard of living have 11 hectares on average, compared with less than 5 hectares for farms in the two lower categories. The standard of living of peasant farmers is thus an increasing function of farm size. The different pattern for households and peasant farmers may be attributable to the much greater importance of farm income for peasant farmers. It is specifically farm income that shows the greatest dependence on farm size, whereas rural households are characterized by strong reliance on components not related to land use, such as salaries, social transfers, and ultimately lease payments received, which are the antithesis of farm size. These results provide clear evidence of the potential for farming to lift rural families out of poverty, and provide support for the need

[30] 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.

to encourage land market development so that land can flow to efficient peasant farmers and improve household welfare.

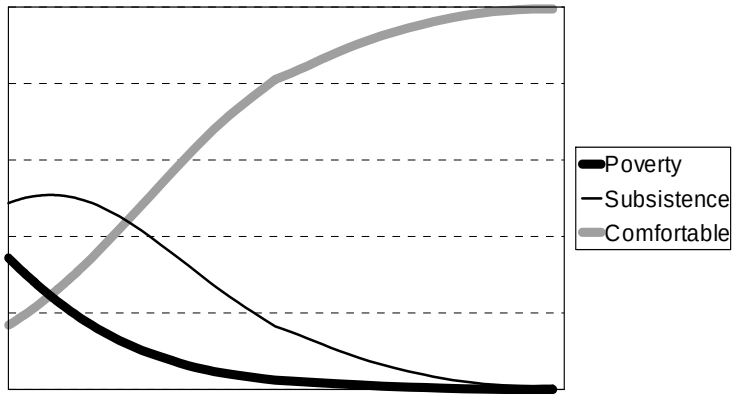

Figure 3.6: Probability of achieving a given standard of living as a function of farm size for peasant farmers. The lowest standard of living "Poverty" corresponds to "Below subsistence" in **Figure 3.5**.
Source: WB 2005 survey.

Development of Land Markets

In all market economies, land markets provide the medium that enables agricultural land to flow from less productive to more productive farmers, thus contributing to productivity growth in the farm sector. Land markets include both sales and rental markets. The more efficiently these markets function, the more effective they will be in getting land into the hands of those farmers who can make the best use of it. As we have seen in the previous chapter, land markets have been developing in Moldova, although problems remain. To the extent that agricultural land is not being efficiently used, this is more a function of the efficiency of land markets today than of the process of privatization in the past. In addition, land markets do not operate in a vacuum: imperfections in input, product and credit markets all affect them negatively.

Fragmentation of agricultural land is perhaps the greatest concern of Government and certain other stakeholders in the agricultural sector. Fragmentation is often blamed for reducing agricultural production efficiency in Moldova. However, it is not always clear which type of land fragmentation is being referred to—fragmentation of parcels or fragmentation of farm size (**see Box 1**). It is important to clarify this issue for all concerned because the implications for land policy differ.

Land markets, and not government regulation, are the main tools for adjustment of farm sizes toward greater productivity and efficiency. Agricultural "land consolidation" is often tabled as the priority for addressing the poor performance of the agricultural sector in Moldova. However, as we saw in the previous chapter, land markets in Moldova are already beginning to function as conduits of land transfer and consolidation. Government-sponsored land consolidation is useful only to the extent that it improves the efficient functioning of land markets, and improved land markets are only useful to the extent that—combined with other enhancements to policies, services and investments for the sector—they improve productivity and promote agricultural growth and rural poverty reduction. In addition, the type of land consolidation required depends on the type of fragmentation to be addressed. The primacy of

transparent land markets in the continued re-structuring of farms and any consolidation of land is codified in Government's own "Economic Growth and Poverty Reduction Strategy Paper (EGPRSP).[31]

FRAGMENTATION OF FARM SIZE

Create a level playing field in which the most efficient farms are allowed to develop. Currently, Moldova has certain policies towards the agricultural sector that appear to favor large farms. For example, the monetary incentives provided for plantation of new vineyards can only be accessed by farms greater than 5 hectares, which is nearly three times the average farm size in Moldova. The program to support Machinery Technical Stations is also virtually by definition targeted to large corporate farms.[32] As we have seen, large, corporate farms are less productive than small, individual farms. These policies are therefore counterproductive because they subsidize the least efficient farms, and also are dubious from an equity perspective. Instead, Government should work to create an environment in which the most efficient farms can prosper. Recommendations for addressing two priority areas in this respect are provided in the Agricultural Markets Note and the Agricultural Public Expenditures Note. With an improved policy climate, agriculture will be more profitable for the more efficient farms, and this will provide them with incentive to expand their operations by purchasing and renting in land.

Improve land sales and rental markets to allow land to flow to the most efficient users—mostly commercial family farms. In general, this is likely to mean that land would continue to flow from very large corporate farms to fairly small individual peasant farms, which as we have seen are more efficient (although the optimal size will vary somewhat depending on the crop and local ratios of labor to land). More importantly, it would further increase the incentive to invest in agriculture because individual farms do a better job of this than corporate—and especially cooperative—structures. In addition, land would also likely flow from the very small plots of households unwilling or unable to farm them. As a result this would correct, at least partially, one of the two manifestations of land fragmentation in Moldova: the average size of the small, individual peasant farms will increase somewhat (for example, to the range of 5 to 50 hectares) as they acquire more land at the expense of the very large corporate farms and very small household plots. It would also bring Moldova's farm structure into closer conformity with the pattern of land concentration and farm structure in market economies. It will not necessarily, however, affect the other dimension of land fragmentation, which involves fragmentation of parcels (rather than farm size).

To improve land markets, reduce transaction costs, increase information availability and ensure tenure security. Frequent talk of mandatory, "administrative" agricultural land consolidation has frightened landowners and potential investors in the sector, discouraged the development of land sales markets, and promoted leasing for short periods. By instead protecting all parties through secure tenure and increased information on rights, owners and potential investors will be re-assured that their property rights will be respected, and this will in turn increase the incentive for purchase and long-term lease of agricultural land and investment in improvement of the land (including, for example, investment in appropriate irrigation infrastructure). In addition, government action is recommended with the objective of facilitating ownership transfers and encouraging the development of land markets as follows:

- Simplify the administrative procedures for transfer of ownership (paperwork, number of trips to regional cadastre office, etc.).
- Reduce transaction costs by reducing the minimum fee charged by notaries and calculating it pro rata, and by allowing multiple parcels to be treated as one consolidated transaction.

[31] "Land consolidation will be addressed through the further development of the agricultural land market," para. 430, EGPRSP, Government of Moldova, Chisinau, May 2004.

[32] See the Agricultural Public Expenditure Note for more information on these subsidy programs.

- Improve the availability of and access to market information on land transactions and prices.
- Instruct both parties to land transactions, and in this case household landowners in particular, on their rights under the law and provide for out-of-court arbitration for dispute resolution.

During the transition to fully developed land markets, use leasing to facilitate more efficient allocation of land. As discussed in the previous chapter, lease markets are a practical alternative to land sales that have provided a number of benefits in transition economies. To realize these benefits, Government should ensure the security of ownership rights while providing sufficient incentive for farm investments by tenants. In Western Europe, the latter has been achieved in some cases through legislation to improve tenant security by imposing minimum length of rental contracts and by regulations for compensating tenants for land improvements and investments.

FRAGMENTATION OF PARCELS

The international evidence on the impact of parcel fragmentation on agricultural efficiency and production is mixed. There are not many studies from other countries that provide guidance on this question. One assessment of two African countries found that although fragmentation of farm parcels was pervasive in both countries, it did not seem to have any adverse impact on productivity.[33] The study found that there were higher costs associated with greater distances between farmers' residences and their plots, but that most plots in the sample were located relatively close to residences. At the same time, higher fragmentation of parcels increased the ability of farmers to diversify their production, which is beneficial for risk reduction. The main conclusion was that land consolidation policies are unlikely to increase land productivity significantly in the countries studied. This finding has important implications for Moldova, where parcel fragmentation exists to a large extent due to an implicit objective of diversification in the privatization process: each individual intentionally received three different types of parcel in three different places—arable land, orchards and vineyards. It is not yet clear that landowners would be willing to forego this diversification for the sake of consolidation, or that they would benefit from it. However, a supplementary analysis carried out for this study using data from Georgia, which has a similar degree of farm fragmentation to Moldova's (the average farm in the sample has 1.6 hectares divided into 2.4 parcels), does provide evidence of a negative relationship between parcel fragmentation and land productivity.[34] At the same time, the equitable distribution of land in Georgia in the early 1990s is widely credited with helping Georgia to avert widespread famine at the time.

There is insufficient quantitative evidence that fragmentation of land parcels has negatively impacted agricultural efficiency or production in Moldova in general, though approximations at the household level suggest a negative relationship. There is insufficient data available to adequately examine how fragmentation of farm holdings into several smaller parcels affects productivity in Moldova. As a first attempt, we were able to derive a rough approximation of this for households using the WB 2003 survey data, but we were unable to do the same for peasant or corporate farms due to a lack of data. The approximation involved using household respondents' reported farm income (including both revenue from sales and the value of own consumption) as a proxy for farm output, and then calculating farm

[33] Blarel, B., P. Hazell, F. Place and J. Quiggin, "The Economics of Farm Fragmentation: Evidence from Ghana and Rwanda," The World Bank Economic Review, vol. 6:2, May 1992.

[34] This analysis is based on the survey of 2,520 rural households in 40 Georgian villages conducted by the Hebrew University of Jerusalem with USAID/CDR funding in March-April 2003. Farm productivity was represented by the partial productivity of land, calculated as the aggregated value of farm output per hectare. Farm fragmentation was represented by three measures: the number of parcels; the average distance to the parcels in each farm; and the Simpson Index, calculated as 1 minus the ratio of the sum of squared parcel areas to the squared area of the total farm. All measures were significant at $p = 0.05$ or better.

income per hectare and per work day as approximations to the partial productivity of land and labor (**see Table 4.1**). Finally, the relationship between these partial productivity measures and the number of parcels was examined using regression analysis. The results demonstrate a statistically significant negative relationship between productivity and the number of parcels for a given farm size. However, unless such a special survey is conducted to collect the necessary data from peasant and corporate farms as well, it is difficult to establish with any degree of authority whether fragmentation of holdings into small parcels has a negative effect on productivity or not.

Table 4.1: Land and labor partial productivity and parcel fragmentation on household plots

Number of parcels	Number of observations	Farm income per ha	Farm income per work day
1	35	946	6.3
2	54	562	3.0
3	72	348	3.4
4	52	288	4.6
5	52	202	2.1
6	30	251	3.6
7	22	193	1.7
8	12	188	1.6
9	5	136	1.3
10 and more	6	97	0.9

Source: WB 2003 survey and study team calculations

Despite the lack of comprehensive hard evidence, there appears to be in Moldova, across all segments of society, general agreement that fragmentation of parcels is a problem. It is generally believed that re-arrangement of small disjointed parcels into contiguous holdings is preferred by farmers and landowners in Moldova. Evidence for this was provided by the large, positive turnouts for discussions carried out at the village level for this study. This is in contrast to consolidation of land into production cooperatives, which a recent survey has show is opposed both by individual farmers (70.6%) and by corporate farm managers (77.4%).[35]

Any re-parceling programs should supplement market-driven consolidation through buying and leasing of land by private entrepreneurs, not replace it. As with fragmentation of farm size, fragmentation of parcels can also be addressed through land markets, with farmers exchanging parcels, or buying or leasing land from one another, in order to create one or two larger, contiguous plots from multiple, small, dispersed plots. In many cases, this would likely have to involve farmers becoming more specialized in the type of production in which they engage. For example, a farmer could give up some vineyards and acquire more arable land, or vice versa. It is important to stress, however, that re-parceling should be carried out on a strictly voluntary basis in accordance with clear market principles. Any government-sponsored or other external intervention would only be needed to the extent that land markets are unable to operate efficiently due to constraints under existing conditions that result in prohibitively high transaction costs. Such constraints could be the result of, for example, the following: too many transactions with too many different parties are required to form contiguous land parcels; communications between landowners are restricted due to, for example, absenteeism or inability to identify owners; the costs of registering the transactions are prohibitively high. These constraints could be alleviated, and market-based transactions to reduce fragmentation of parcels facilitated, by an organized re-parceling program. This sort of re-parceling of land—as opposed to "consolidation" into larger farms—could be

[35] "Agricultural Policy in Farmers' Opinion," East-West Management Institute, Private Farmers Assistance Program, Chisinau (2005).

attempted first through pilots in order to test the approach in the context of Moldova and gauge the impact and interest.

LAND RE-PARCELING PILOTS

Basis for Land Re-Parceling

There is a significant international body of land re-parceling experience to draw upon, both in the West and in the East. In Western European countries, including Denmark, Germany and Holland, land re-parceling has been applied for some time and has proven to be a successful instrument in the land management toolbox. More recently, the countries of Eastern Europe and the CIS have begun a second wave of land reform using re-parceling. As in Moldova, initial land reform in many of these countries was driven by considerations of political justice and equity, and was successful in these respects, but resulted in land fragmentation. In response, almost all countries in the region have had experiences with land re-parceling in the years since independence. Many projects have been donor-funded and implemented together with Western European land re-parceling experts and agencies. Some of the countries are still at the beginning of the process of developing their own land re-parceling model based on pilot experiences, while other countries are ready to or have already begun a country-wide land re-parceling program. An example is Lithuania, where the first land re-parceling pilot project began in 2000[36]. After a second pilot project with three pilot sites and incorporation of lessons learned,[37] Lithuania will introduce a full-scale land re-parceling program in 2005 co-financed under the EU Rural Development Program (**see Box 3**). In an attempt to share Eastern European and CIS experiences with land re-parceling and to identify best practices, FAO has published design guidelines and an operations manual on implementation of such pilots.[38]

Box 3: Experiences with Land Re-Parceling Pilot Projects in Lithuania

Since independence in 1991, Lithuania has been through a long land reform process with restitution of private ownership to agricultural land. As of January 1st, 2005, land rights have been restored to 91 percent of the area. The result of the restitution process has been an agricultural structure with an average farm size (9.1 ha) less than the average farm size in 1939 before WWII. The first land consolidation experiences in Lithaunia were from the Danish-Lithuanian bilateral land consolidation pilot project in the Dotnuva area during September 2000 and January 2002. The main scope of this first project was narrowed to improvement of the agricultural structure in the pilot area by enlarging farm sizes, reduction of fragmentation and improved access to roads. A voluntary, marked-based approach was applied. Agreements were reached by way of negotiation with all landowners and other stakeholders. 19 private landowners out of a total of 79 in the area participated in the project and 86 ha changed owners.

The second land consolidation project began in October 2002 and was finished at the end of 2003. The overall idea of this project has been to continue the work from the first pilot project and to introduce land consolidation as a tool for implementation of measures for local rural development. Three land consolidation pilot sites were selected, *Akademija, Pabaiskas* and *Puskelniai.*

In the **Akademija project area,** the land consolidation project mainly concentrated on improvement of the agricultural structure. 21 landowners participated and 122 ha change owner. The three biggest family farmers in the area all increased the size of owned land and fragmentation was reduced. Many small plots were amalgamated into one big plot. Four hectares of state-owned agricultural land was privatized to facilitate project implementation.

[36] Land Consolidation Pilot Project, Dotnuva Area, Lithuania. Final Report, DFFE, April 2002.
[37] Land Consolidation: A Tool for Sustainable Rural Development. Final Report, DFFE, March 2004.
[38] The design of land consolidation pilot projects in Central and Eastern Europe, FAO Land Tenure Studies no. 6. FAO, 2003 and Operations manual for land consolidation pilot projects in Central and Eastern Europe, FAO Land Tenure Manuals no. 1. FAO, 2004. Now available in Russian.

In the **Pabaiskas project area,** the land consolidation project included 32 landowners and 82 ha change owner as part of the project. A state aforestation project was one of the main measures for local rural development. The aforestation is implemented as a result of the land consolidation. 18 ha of free state-owned land of poor soil quality was transferred to the local State Forest Enterprise for aforestation. The aforestation project will support and complement private investments in rural tourism. A total of 38 ha of State land was privatized through the project.

In the **Puskelniai project area,** the land consolidation project included 10 landowners. 22 ha change owner during the project. Many of the land plots in the area had been cut through during the construction of the new Via Baltica Highway. It has been a main objective for the project to reduce the fragmentation caused by the new road.
It was one of the main activities of the projects to give input to the on-going work in the Lithuanian Ministry of Agriculture with the development of national policy towards re-parceling and consolidation. Lithuania will introduce country-wide land re-parceling projects in the second half of 2005 co-financed under the EU Rural Development Program.

There is also some experience with land consolidation in Moldova. Valuable field experiences have been made during the last couple of years, both under the USAID-funded Land Privatization Support Project (LPSP) consolidation component and by the government-operated Planning Institute for Land Management (**see Box 4 for details**). Simplified procedures for registration and implementation of the land transactions in the projects have been developed. These procedures will be very useful when developing future land re-parceling procedures in Moldova. The consolidation experiences so far demonstrate a clear interest in land re-parceling by many Moldovan agricultural landowners. However, neither the LPSP projects nor the projects done by the Planning Institute have holistically focused on taking care of the interests of all the landowners in a village. The object has mainly been to assist dominant buyers/investors, usually representing large, corporate farms, in purchasing as many contiguous land plots from smallholders as possible. In other words, they have implemented consolidation in the broader sense rather than simply re-parceling. It is our assessment that the interests of the individual family farmers in the projects to a large extent have been neglected. One reason for this is that land re-parceling programs should consist of two phases: (i) the design phase; and (ii) the registration and implementation phase (see below for more details). The above-mentioned experiments have only consisted of the latter, usually at the request of a large investor. Further, none of the consolidation activities so far are part of a clearly defined government strategy. The LPSP consolidation component lacks sustainability since all activities are foreseen to finish at the end of the project period in early 2006. In order for any future land re-parceling program to be sustainable, there would be a need to scale-up the experiences of the previous programs to the national level, integrate them in government systems, and ensure that the needs of smallholders are taken into consideration.

Box 4: Experiences with Land Consolidation in Moldova

Land Privatization Support Project (LPSP)

The Land Privatization Support Project in Moldova is funded by USAID and implemented by DAI consultants. The project period is May 2003 – May 2006. The main scope of the project is correction of land title problems that occurred after the privatization of agricultural land and the registration of private land ownership. Different types of mistakes are found and systematically corrected. A separate component under the project is to develop assistance with land transactions[39]. During the implementation of the LPSP, requests were received to address agricultural land fragmentation. In response, consolidation activities under the LPSP were begun with a pilot project in Antonesti village in Stefan-Voda Raion in the Southern part of Moldova[40]. The project was implemented in the Summer-Autumn, 2004. Over 200 landowners participated and around 160 ha were consolidated via 25 year lease agreements to a single winery. One hundred new jobs for the villagers at the winery were promised as a result. At the beginning of 2005 several other projects were already implemented or in the process of implementation in other areas. In a clear majority of projects the instrument has been selling and buying of land

[39] LPSP, Report on Project Activity (May 2003 – May 2004), 2004, p. 14.

[40] LPSP, Quarterly Report on Project Activity (June – September 2004). p. 12.

and not lease.

The consolidation projects under the LPSP are normally initiated by an active buyer (winery and/or agricultural enterprise) in the project village, who over a period of time has tried to purchase contiguous land plots for large-scale agricultural production. It is the responsibility of the buyer to negotiate the agreements with the small individual owners and not an integral part of the project. The project serves as an intermediary between landowners and buyers and supports the mayor's office in the village in the use of a simplified land transaction method developed under the LPSP and following the procedures of the 2002 Amendment to the Land Code. The projects in the field are operated by legal consultants from the NGO Agency for Consulting and Training in Agriculture (ACSA). When small owners with land plots in the interest area prefer not to sell their land, they are 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 is the main buyers/investors and the result is development of large-scale farms, often owned by wineries or agricultural enterprises from outside of the village, and only as a side output development of private family farms. A major achievement of the LPSP projects is the development of a simplified registration and implementation procedure for the project land transactions where among other things some of the tasks normally carried out by a notary can be handled by the mayor's office. The LPSP subsidizes the costs further in order to develop the land market. All activities are foreseen to end when the LPSP finishes in May 2006 (and most by the end of 2005).

Planning Institute for Land Management

During the last couple of years land consolidation activities have also been implemented under a Government program operated by the Planning Institute for Land Management. Nine consolidation projects, mainly in the Southern part of Moldova, have been carried out. In many ways the projects implemented by the Planning Institute follow the same procedures as the consolidation projects under the LPSP, including the simplified transaction procedures. Not all 9 projects follow the exact same procedures but 2-3 different models. Lack of funding is limiting the consolidation activities done by the Institute. The focus of the projects typically appears to be the interests of the investor buying up/leasing land from smallholders. The largest consolidation project done by the Institute so far is implemented in Cociulia Village, Cantemir Raion. In the project 172 landowners participated and 294 ha changed owners. 257 land plots were consolidated into 181 plots. In one specific project in Tomai village in Stefan-Voda rayon, the scope of the project is to re-create cooperative/collective farms. The former private landowners are issued land titles without a physical location of the plot (they become shareholders in the collective farm). During the process, private owners who are not willing to merge their land into the cooperative are offered an exchange outside of the main collective area.

There is now a good basis for the implementation of full land re-parceling pilots in Moldova. Through efforts during the first phase of land reform in Moldova, operational procedures for updating of land registers have been established, the privatization process has been successfully implemented, and land markets are developing. According to popular opinion, and re-enforced by field visits carried out for this study, there is a widely acknowledged problem with fragmentation of parcels. At the same time, surveys such as the WB 2005 survey carried out for this study and discussed in detail in the previous chapter suggest that there is a significant number of rural households who are interested in farming. Further, there is already experience with implementation of land consolidation/land re-parceling projects. These experiences have helped to develop simplified transaction registration and implementation procedures. They have also demonstrated that implementation of land re-parceling is entirely possible under the current Land Code, and no additional legislation is needed. Therefore, implementation of land re-parceling pilot projects under the present circumstances is relevant and feasible.

Proposed Concept for Land Re-Parceling Pilot Projects in Moldova

As part of the Moldova Agricultural Land Policy Note, a Background Report that develops the concept for land re-parceling pilots was prepared at the request of the Government of Moldova. This report was prepared by a group of Danish land consolidation specialists under contract with the World Bank, and was presented separately at the recent land consolidation conference in Chisinau sponsored by

MAFI and USAID/DAI.[41] The objective of the Background Report is to analyze the current situation in Moldovan land markets and land management practices, and give practical recommendations on goals, procedures and best modern practices for land re-parceling. An overview of the report's recommendations is presented below. The main principles are listed and practical aspects of the approach are presented by briefly reviewing aspects of the organization, techniques, and knowledge required for implementation, as well as the expected outcomes. The design of the proposed land consolidation pilots will be finalized and presented in a Pilot Program Design Report after receiving feedback from stakeholders including Government, farmers, NGOs, and donors. Additional details, including estimated project costs and timing, are available in the Background Report.

The proposal is to begin with pilot land re-parceling projects in order to test the approach in the Moldovan context and demonstrate the results to the various stakeholders. The proposed approach to land re-parceling is characterized as a process delivering improvements in location, ownership and land use that exceed what individuals can accomplish in bi-lateral exchange of land with each other. Land re-parceling provides an organizational input that handles simultaneously a larger volume of transactions than is possible for individuals. The approach is founded on the principles of voluntary participation and the use of land markets.

The pilot projects in land re-parceling have the small peasant/private family farms as the principal target group. This marks a difference in priority from previous land re-parceling activities in Moldova that tend to reflect the initiative and agenda of the stronger actors in the land market, typically as buyers. This, however, does not exclude complementary and mutual benefits and the participation of all types of landowners and local stakeholders. The central focus is on landowners' preferences. The essential activity is to screen landowners for their preferences and identify land exchanges in which people are willing and able to engage.

The main principles of voluntary participation are:

- Transactions of land exchange within the land re-parceling pilots happen as selling and buying between owners.
- Owners have the right to enter into such transactions or not, subject to compliance with legislation as in any other property transaction.
- An owner is only committed when signing an agreement specifying the transactions. Owners are, therefore, not committed at the outset of land re-parceling and they are still free to consider other options during the negotiation stage.

These principles imply certain simplifying advantages: Firstly, there is no specific requirement to design land exchanges so as to make value before equal value after. This is a requirement often defined to protect the rights of dissenting owners when a land re-parceling project is enforced. In practice, such a design requirement creates higher costs due to the detailed data and increased workload required. In a system of voluntary participation, differences in value can be evened out in payments if parties can agree and afford them. Besides, the scope for net selling facilitates a potential change in size distribution: net increases for some owners imply net sales by others. Secondly, there is no enforcement problem and, therefore, no subsequent appeal cases. Owners who find possible options unattractive are free not to participate. Yet, there may be complaints. For example, some complaints may concern technical errors as when an owner does not receive the area he has paid for, some owners may argue that their preference or proposal were not seriously considered, etc. In the pilot stage complaints will be considered by a steering

[41] Haldrup, N. and M. Hartvigsen (2005), *Land Re-Parceling Study Background Report*, prepared for the World Bank by the Danish Directorate for Food, Fisheries and Agri-Business, Land Consolidation Division.

committee (see below). In a more established framework the lead agency that assumes overall responsibility for land re-parceling will consider complaints.

The operational aspects of the pilot land re-parceling project are listed below under the four headings: *organization, technique, knowledge requirements and results*. The following briefly reviews these aspects, which shall be operationalized at a later stage of the project design. A particular term is introduced to denote the activity of negotiating and designing the solution to land re-parceling. In this text we say "land re-parceling design" and the person or team performing this task is referred to as the "land re-parceling designer".

Organization

The present absence of co-ordination between ongoing land re-parceling efforts in Moldova should be overcome. A forum for coordinated initiatives on pilot projects and innovation of methodology should be established. A shared vision and agreed approach should be worked out as a point of departure. Such a forum could be a steering committee with participation of the Ministry of Agriculture and Food Industry, the State Agency of Land Relations and Cadastre, and local government in the pilot areas, the Planning Institute for Land Management, the LPSP project, ACSA and representatives of farmers.

Important issues of initial organization to be decided in setting the framework for pilot projects include:

- Agree on the overall concept
- Outline main principles
- Select pilot project areas
- Specify inputs and incentives offered and secure financing
- Appoint personnel to be attached to the pilots

For the operational organization, a number of existing procedures can be applied, including the procedure for provision of property information, the procedure for correction of various registration errors revealed in the process, the procedure for provision of maps, and the procedure for implementing property transactions.

The new activities introduced by the pilots will have to be performed by the land re-parceling design team in the field. These activities include the following categories:

- *Consultation*: The initial information and awareness activity and the consultation/interviews of individuals.
- *Property related extension service:* Given that many owners have little experience with property transactions, there is likely to be a need to assist them in clarifying the consequences and pre-conditions for their decisions. The linkage to a property extension service (such as the ACSA land transactions consultants) will become very important. The consultants can individually advise the landowners of the costs and benefits of the different options of participation in the project.
- *Valuation:* There will be a need to assist participants in reaching price levels acceptable for both sellers and buyers.[42]
- *Mediation:* Combining the many individual preferences takes some measure of mediation. The

[42] Valuation principles in land re-parceling are discussed in more detail in the land re-parceling Background Report prepared for this study.

design team deals with all owners, it becomes familiar with all the internal relations in the village, and it manages confidentiality and fair relations between all owners.

The composition of the local land re-parceling design team should include a land re-parceling designer with experience from the land registration process working together with the local cadastral engineer. Such a combination links local knowledge with a professional and external impartiality. The design team must for the implementation of the pilot project be supported by a team of international specialists with previous experience in this field.

Technique

The pilot projects will meet challenges and explore innovation in a range of technical features. There must be a specific economic incentive for the participating landowners. Commonly this is that property transactions are free or greatly reduced for the landowners within the land re-parceling project and funded by the pilot project. However, the main incentive for the landowners and stakeholders to participate will be the expected benefits of the re-parceling process: closer, contiguous parcels and facilitated access to land markets in the future. The first pilots should be limited in size and duration to keep them manageable.

A participatory approach is needed to establish better methods for using maps (and perhaps GIS software based on digital maps) and available register information as a medium for engaging the beneficiaries in the process. Presenting the baseline situation and different re-parceling proposals is a special technical challenge when fragmentation is extreme. Nonetheless, techniques need to be devised to convey images of location and possible alternatives in clear, comprehensible ways.

The voluntary principle defines a planning process where the solution only emerges as owners sign agreements on transactions. This means that the solution is not known at the outset and that it typically only materializes at a late stage. It is in this respect that land re-parceling design differs from conventional land registration tasks that typically proceed according to regulations and require compliance by owners and approval by professionals. An additional implication is that the notion of "plan approval" does not apply. There are only individual transactions. It is just that they are designed to happen at the same time.

Selection of the best possible pilot sites for the land re-parceling project in Moldova is a precondition for a good result of the pilot project.[43] For the first pilots, it is tentatively proposed to select approximately three different sites representing different regions with different agricultural and land market conditions. It is helpful to consider a wide range of different aspects before selecting candidate communities for land re-parceling pilot activities. Due to the detailed knowledge required to identify and assess candidate communities, the participation of local government is very important to the success of the selection process. Criteria of importance for the selection include:

- Existence of family farms with potential for commercial farming and a desire to form contiguous parcels and eventually enlarge the farms.
- Fragmentation of parcels.
- An existing land market (presence of both potential sellers and buyers).
- Availability of free state-owned land for inclusion in the project (sales and exchange).

[43] The following is based on *Getting Land Consolidation Pilot Projects Going*. FAO Workshop discussion paper by Niels Otto Haldrup and Morten Hartvigsen, DFFE, January 2005, pp. 2-3.

- A relatively small number of absentee owners.
- A high level of completion of land reform/privatization and registration of land ownership.
- A relatively high level of satisfaction among local landowners and stakeholders with the privatization process and outcome.
- Few land disputes and no problematic ones.
- Soil with good potential for agricultural production.
- Location within a designated economic growth area of the country (land re-parceling can be linked to other development activities).
- Existence of (digital) cadastral maps and other thematic maps.
- Plans/measures for sustainable local rural development and infrastructure improvement.
- Initiative and commitment from local government.
- Local capacity for land re-parceling design and land use planning.
- Proximity to capital city or other base for land re-parceling lead agency.

One point is worth elaborating on here. As discussed in Chapter 1, Moldova still has a significant amount (33%) of agricultural land that belongs to Government, at both the central and local levels. Some of this (16%) is actually designated as "reserve" and was originally intended to provide a pool of land for redistribution, although it was never used for this. Experience from other countries has shown that **the availability of government land funds can act as a catalyst for land re-parceling, greatly simplifying the task and improving the final results**.[44]

Knowledge Requirements

The key qualification is the ability of the field workers—the land re-parceling design team—to perform the process of screening of preferences of the landowners and stakeholders, assimilating the whole complex of facts and in the end combining the individual preferences into transactions which the owners can agree upon and afford. The re-parceling designer/team is accountable for legitimate consultation and decision making. Key qualifications include the ability to deal with people in groups and individually, to strike the balance between flexibility and impartiality, and – above all – to manage confidentiality. The crucial indicator is whether owners and others concerned are happy with the process.

Obvious candidates for the land re-parceling designer function are persons who participated in the privatization and registration process. They are familiar with the basics of land administration in concept and procedure. They are familiar with techniques in mapping and handling of data and text. Land re-parceling design will give them a more inter-disciplinary professional profile. The critical input in pilot projects is carefully designed training of local designers tailored to the specific needs of the individuals and follow-up by close supervision. As the stage of privatization and first registration of property is completed there is a general challenge in transferring professionals into other land-related activities and thereby retaining their knowledge. Land re-parceling may be one such way of maintaining and consolidating professional expertise in land administration and management.

Expected Results

[44] Workshop Report and Statement from International Workshop: Land Banking / Land Funds as an Instrument for Improved Land Management in CEEC and CIS, Tonder, Denmark, 17th – 20th March, 2004. DFFE / FAO, 2004.

The overall objective of the pilot projects is to test the demand for, and feasibility and impact of, voluntary land re-parceling aimed at the smaller peasant holdings/private family farms, but open to all landowners and stakeholders. Specifically, the pilot projects will provide more insight and experience on the following issues and likely identify new issues:

- Changes to the local agricultural structure via land re-parceling.
- Impacts on efficiency of production.
- Equity of benefits of the re-parceling activities.
- Concrete preferences of owners.
- Participation by owners in the design process.
- The need for advice on property related issues.
- Handling of a whole village situation as an iterative process
- Valuation techniques.
- Mapping techniques.
- Cost levels.
- The potential for improving the basis for credit through re-parceling
- Training needs and experience with supervision.
- Indication of future need for education in professional education.

Of crucial importance for the pilots will be the inclusion of a strong monitoring and evaluation component. As part of the Pilot Program Design Report, project parameters will be structured in a logical framework set-up. This will provide benchmarks for recurrent monitoring and evaluation. In addition, a baseline will be established before implementation of the pilots using primary survey and secondary data, and comparable measures taken after implementation in order to gauge the impact on important parameters such as farm structure, efficiency, equity and investment. This will increase the ability to convince donors who may consider funding the implementation of scaled-up land re-parceling projects in the future, and farmers who may consider participating, of the potential benefits.

Land re-parceling has the potential to yield significant benefits for Moldova, but should be considered as just one specific tool to address one potential challenge of many facing the agricultural sector. Land re-parceling is only useful to the extent that it facilitates the efficient functioning of land markets. But even this is not enough. Evidence from other countries has shown that land markets are adversely affected by imperfections in input, product and credit markets, and, as is shown in other policy notes in this series, these problems are definitely evident in Moldova. Therefore, land re-parceling should be thought of as only one aspect of a coordinated strategy for development of the agricultural sector, which should also include addressing the problems in the other markets mentioned, as well as improving government services and investment for the sector.

ANNEX: TOTAL FACTOR PRODUCTIVITY CALCULATIONS

To resolve the ambiguity inherent in the calculation of partial productivity measures in Chapter 2, we have to calculate a measure of Total Factor Productivity (TFP). Partial productivity reflect the use of a single input (land or labor) taken separately. They often present an ambiguous picture, as some farms may have a higher productivity of land (say) and a lower productivity of labor. The ambiguity is resolved by switching from partial productivity to total factor productivity (TFP), which is calculated as the ratio of the value of output to the aggregated cost of input use. In the absence of market prices for valuing the cost of inputs (such as the price of land), TFP is usually determined by estimating a production function and then using the estimated input coefficients as the weights to calculate the value of the bundle of inputs. The ratio of the observed output to the estimated bundle of inputs is the TFP.[45]

Table A.1: Size characteristics and productivity measures for small and large farms: survey data

	WB 2003 survey		PFAP 2003 surveys		WB 2000 baseline survey	
	Small farms (individual)	Large farms (corporate)	Small farms (individual)	Large farms (corporate)	Small farms (individual)	Large farms (corporate and individual)
Number of observations	176	22	1,166	521	170	180
Ag land (ha)	4.48	971	4.02	918	5.7	533
Workers	4.51	332	6.27	150	1.6	43.7
Ag output ('000 lei)	25.8	3,230	25.3	2,038	75.4	1,642
Output/ha (lei)	6,765	2,745	9,535	2,085	6,414	3,145
Output/worker (lei)	6,857	17,135	5,145	17,824	55,304	54,393
Workers/ha	1.42	0.26	3.25	0.19		

Note: All differences between small and large farms are statistically significant at $p = 0.1$ (except the differences in productivity of labor – output/worker – in the WB 2000 survey).

The TFP calculations demonstrate conclusively that small farms are more efficient than large farms. To show this, we estimated production functions to calculate the TFP in absolute values for different groups of farms using several different data sets. Extensive data for small and large farms are available from four surveys: the World Bank 2003 survey conducted as part of a cross-country study of reform impacts; the PFAP 2003 survey of corporate farms; the PFAP 2003 survey of individual farms; and the World Bank 2000 baseline survey conducted as part of the preparation work for the Moldova Agricultural Strategy. **Table A.1** provides an overview of the various data sets.[46] **Table A.2** presents the estimated

[45] In principle, the production function can be estimated for any number of observed inputs. In the economic literature, however, TFP is typically calculated assuming two inputs: capital and labor. We have decided to follow the same approach from considerations of data reliability, which also suggested using only land as a proxy for capital (ignoring the extremely deficient data on farm machinery and buildings). The physical variables (land area and number of workers) were judged to be much more reliable and consistent than the accounting figures for other factors of production, such as the cost of purchased inputs and the value of fixed assets (especially for individual farms). For a calculation of TFP as the ratio of output to the reported cost of inputs see the recent World Bank report on farm restructuring by N. Dudwick, K. Fock, and D. Sedik (2005).

[46] General analyses of these surveys can be found in the following unpublished reports: N. Dudwick, K. Fock, and D. Sedik, *A Stock-Taking of Land Reform and Farm Restructuring in Bulgaria, Moldova, Azerbaijan, and Kazakhstan* (World Bank, February 2005) for the WB 2003 survey; A. Muravschi and others, *Efficiency of the Agricultural Sector in the Post-Privatization Period* (USAID/PFAP, Chisinau, 2004) for the two PFAP 2003

production function coefficients and the weights used in TFP calculations. Two features are worth highlighting in these numbers. First, in two-input production functions in the economics literature, agricultural land typically accounts for around 70% of input use and labor for 30% (see the rows for input weights); the results here are not inconsistent with that pattern. Second, mixed samples of individual and corporate farms (WB 2003 and WB 2000) reveal *decreasing* returns to scale (the sum of the estimated coefficients is significantly less than 1).

Table A.2: Regression coefficients and input weights in production functions estimated for three samples

	WB 2003 survey (n = 198)	PFAP individual farms (n = 1166)	PFAP corporate farms (n = 521)	WB 2000 survey (n = 268)
Estimated coefficients:				
Ag land	0.6007	0.5247	0.8150	0.6305
Workers	0.2993	0.1865	0.3068	0.2325
Sum of coefficients	0.90	0.71	1.12	0.86
R^2	0.77	0.40	0.84	0.89
Input weights:				
Ag land	0.67	0.74	0.73	0.73
Workers	0.33	0.26	0.27	0.37

Note: The estimated coefficients are significantly different from zero ($p< 0.01$); all sums of coefficients significantly different from 1.

surveys; and Z. Lerman, *Moldova: Baseline Farm Survey October-November 2000* (World Bank, April 2001).