

منظمة
الأغذية والزراعة
للأمم المتحدة

联合国
粮食及
农业组织

Food and Agriculture
Organization of the
United Nations



Organisation des
Nations Unies pour
l'alimentation et
l'agriculture

Продовольственная и
сельскохозяйственная
организация
Объединенных Наций

Organización de las
Naciones Unidas para la
Agricultura y la
Alimentación

FAO Regional Office for Europe and Central Asia
Policy Studies on Rural Transition No. 2008-1

The Economic Effects of Land Reform in Tajikistan

Zvi Lerman and David Sedik

October 2008

The Regional Office for Europe and Central Asia of the Food and Agriculture Organization distributes this policy study to disseminate findings of work in progress and to encourage the exchange of ideas within FAO and all others interested in development issues. This paper carries the name of the authors and should be used and cited accordingly. The findings, interpretations and conclusions are the authors' own and should not be attributed to the Food and Agriculture Organization of the UN, its management, or any member countries.

Zvi Lerman is Sir Henry d'Avigdor Goldsmid Professor of Agricultural Economics, The Hebrew University of Jerusalem, Israel

David Sedik is the Senior Agricultural Policy Officer in the FAO Regional Office for Europe and Central Asia.

Contents

Executive summary	1
1. Introduction: purpose of the study.	5
2. Agriculture in Tajikistan.	7
2.1. Geography of agriculture in Tajikistan.	8
Agro-climatic zones of Tajikistan.	10
Regional structure of agriculture.	13
2.2. Agricultural transition in Tajikistan: changes in output and inputs.	15
Agricultural land.	16
Agricultural labor.	17
Livestock.	17
Farm machinery.	19
Fertilizer use.	19
3. Land reform legislation and changes in land tenure in Tajikistan.	21
3.1. Legal framework for land reform and farm reorganization.	21
3.2. Changes in farm structure and land tenure since independence.	24
4. The economic effects of land reform	27
4.1. Recovery of agricultural production in Tajikistan.	28
4.2. Sources of recovery of agricultural production in Tajikistan	29
Land and labor productivity growth.	29
Productivity and recovery by farm type.	31
<i>Growth in crop and livestock production 1997-2006.</i>	32
<i>Crop and livestock productivity 1997-2006.</i>	32
<i>Sources of crop and livestock growth 1997-2006.</i>	35
4.3. Structural changes in Tajik agriculture	36
Changes in cropping pattern	36
Concentration of livestock in the household sector.	39
4.4. Land reform and family well-being.	40
Land holdings and well-being	41
Land leasing, farm size, and family income.	43
<i>Sources of land.</i>	44
<i>Leasing and family income.</i>	44
5. The limitations of land reform and their effects.	46
5.1. The financial crisis in Tajik agriculture	46
5.2. Administrative Interference and “Freedom to Farm”	50
5.3. Financing and marketing cotton: survey findings for family dehkan farms. . .	52
Sources of finance for family dehkan farms.	53
Satisfaction rating of investor financing among family dehkan farmers. . .	55
Debt levels and repayment capacity for family dehkan farms.	56
6. Conclusions.	58

The Economic Effects of Land Reform in Tajikistan¹

Executive Summary

The purpose of this study is to analyze the economic effects of land reform policies in Tajikistan on the country's agricultural sector and rural households. There is a conspicuous lack of evidence-based policy dialogue with the government on the effectiveness of land and agricultural policies in Tajikistan. Though the majority of rural inhabitants live in poverty and many are food insecure, a scientifically proper evaluation of the effects of land and farm policy reforms has yet to be done. The present study is an attempt to fill this void by offering a description of land reform and an analysis of its economic consequences in Tajikistan.

Agriculture in Tajikistan

Tajikistan is a highly agrarian country, with agriculture accounting for 60% of employment and around 30% of GDP. Tajikistan also had the highest rate of rural poverty in the Europe and Central Asia region in 2003: 76% of the population live below \$2.15 per day (PPP) compared with 72% in Kyrgyzstan and 55% in Uzbekistan.² The highly agrarian structure of employment in the economy and the high rates of rural poverty imply that improvements in agricultural performance have substantial potential to improve the livelihoods of the rural population.

In the early post-Soviet years before effective land reform began in Tajikistan agriculture suffered a devastating decline in Gross Agricultural Output (GAO). The transition decline in Tajik agriculture began in 1990-91 with the disintegration of the traditional Soviet agricultural system. With the breakdown of this system of price and supply controls, prices of inputs rose faster than procurement prices, and farms could no longer afford to purchase inputs on the scale they had in the past. Purchases of fertilizer, pesticides, seeds, and feed fell abruptly, causing a fall in agricultural output of 50%. Only agricultural land and labor seem to have been unaffected by the transition. As in other Central Asian (and Transcaucasian) countries, agricultural land remained relatively constant in Tajikistan, while agricultural labor continued to increase over the entire period of transition.

Land reform legislation and changes in land tenure in Tajikistan

Agricultural land is at the center of the reform agenda in any transition country. In Tajikistan the dissolution of the Soviet agricultural system after 1990 and the production decline pointed to the need for reform. However, the Tajik approach to this issue has been gradual and limited.

The first legal acts on land reform and farm restructuring in Tajikistan were issued in 1992, but land reform began in earnest only in 1995, with a presidential decree allocating additional land to household plots – always a highly productive sector in all of the former Soviet Union.

¹ Report prepared for the European Commission under the EC/FAO Food Security Programme—Phase II: “Food Security Information for Action”.

² *Growth, Poverty and Inequality: Eastern Europe and the Former Soviet Union* (WB, 2003), p. 242.

In parallel (1995-1996) Tajikistan moved to reorganize the traditional collective and state farms into new corporate forms in the hope that restructuring would improve productivity in a notoriously inefficient sector. When this largely cosmetic restructuring failed to produce efficiency gains, the country switched the focus of its attention to dehkan (peasant) farms as a model of family farming. Since 1999, dehkan farms have largely supplanted the corporate farms – limited liability companies, leaseholding enterprises, joint stock companies, agricultural cooperatives – as the main agricultural land users. Unfortunately, roughly one-third of the 30,000 dehkan farms today are organized as *collective dehkan farms*, which seem to perpetuate the kolkhoz form of organization despite the new name. Nevertheless, land reform efforts have irrevocably changed Tajikistan’s agriculture from the Soviet dual system of large-scale farm enterprises and tiny household plots to a tripartite farm structure spanning the entire spectrum of sizes from small (though enlarged) household plots through mid-sized dehkan farms to remnants of large corporate farms.

The land reform in Tajikistan has had two main effects in terms of land transfers to different farm types. First, 6% of agricultural land is now in household plots, which represents a many-fold increase from the traditional 1% in the Soviet period. As household plots have virtually no pastures, their share in arable land is much higher than in agricultural land, approaching a respectable 20% in 2007. Second, dehkan (peasant) farms have increased in area from less than one-half percent of agricultural land in 1995 to 60% in 2007. While household plots are true individual or family farms continuing from the Soviet period, they account for only a small part of the land in the family farm sector in Tajikistan. Many dehkan farms are also individual or family farms, but unfortunately not all of them. A large part of dehkan farms are in fact *collective* dehkan farms and despite the “peasant” adjective in their name they are corporate successors of former collective or state farms. To obtain a proper estimate of the importance of the *family* farm sector in Tajikistan, the dehkan farms need to be separated into *collective* dehkan farms and *family/individual* dehkan farms.³ Partial information obtained from Tajikistan’s State Agency for Surveying, Cartography, and Land Use suggests that in 2004-2006 fully two-thirds of land in dehkan farms was actually held in family or individual dehkan farms, as opposed to collective dehkan farms. All told, individual farms in Tajik agriculture account for 45% of agricultural land and 60% of arable land.

The economic effects of land reform

We can distinguish four main effects of land reform in Tajikistan. The first is the recovery of agricultural production that began in 1998 and brought Tajikistan’s agriculture back to pre-transition levels by 2007. Land reform was to a great degree responsible for this agricultural growth by expanding the stock of land at the disposal of household plots and dehkan farms. The lion’s share of the growth in this recovery is attributable to growth of production in household plots with some growth coming from newly formed dehkan farms.

The second effect of land reform concerns the sources of growth—productivity increases as well as increases in land and livestock. Much of the growth in GAO can be attributed to productivity increases, and the lion’s share of productivity increases has come from household plots. The low productivity performance of enterprises and dehkan farms may be an indicator of how little these farms have changed from their predecessors. For livestock production household plots hold 87% of inventories, and are thus responsible for nearly all production. Here too productivity increases in household plots were responsible for 40% of

³ By 1 January 2006 dehkan farms numbered 27,040 of which 18,300 were individual or family based and 8,740 were collective dehkan farms (data from the Agency for Surveying, Cartography, and Land Use).

production increases. In sum, the main achievement of land reform has been the redistribution of land to household plots that have increased agricultural production primarily through increased productivity.

A third effect of land reform involves important structural changes in agriculture, in cropping patterns and in the sectoral structure of agriculture. Distribution of additional land to household plots and the restructuring of agricultural enterprises have necessarily resulted in a loss of control by the government over the mix of crops produced. As a result, the area sown to cotton has fallen and the area in grain and horticultural crops has increased. In addition, land reform has resulted in the near total transfer of livestock inventories to household plots.

The final effect of land reform in Tajikistan has been an improvement of rural family incomes through the increases in land in household plots and family dehkan farms. In other CIS countries where individual agricultural assets and production have increased there has been a corresponding growth in rural incomes (Lerman and Sedik, forthcoming). We observe similar changes in Tajikistan.

The limitations of land reform and their effects

For all its achievements—the recovery of agricultural production, the increase in land and livestock productivity, the structural changes in crops and livestock and the positive effects of additional land on family incomes—the Tajik land reform still has a number of key limitations that restrict its beneficial effects. These limitations of land reform have been at the center of concern of the government and donors for a number of years now, because many believe that land reform has not lived up to its potential in Tajikistan.

The first major limitation of land reform in Tajikistan is that it is incomplete. There is still a large portion of agricultural land occupied by unreformed farms. Thirty five percent of agricultural land still remains in agricultural enterprises and an additional twenty percent remains in collective dehkan farms, according to the State Agency for Surveying, Cartography, and Land Use. A consequence of this limitation is the far lower productivity observed in agricultural enterprises and dehkan farms. A further consequence of the incompleteness of land reform is the financial crisis in Tajik agriculture. Agricultural enterprises and collective dehkan farms face a debt crisis caused by a lack of profits and continued bank lending regardless of credit-worthiness. Though the debt crisis is best documented for farms growing cotton, it is a general problem of enterprises and collective dehkan farms. The experience of other countries that have gone through such a debt crisis is that the accumulation of farm debt eventually demonetizes the rural economy. No agricultural enterprise is able to conduct normal buy and sell farming operations when it is burdened by overdue debt.

A second major limitation of the land reform is that managers of agricultural enterprises and dehkan farms are often compelled to plant cotton. Dehkan cotton farmers have much less freedom of decision than other dehkan farms, regardless of the specific organizational form. Hukumat intervention is quite pervasive for cotton growers and virtually nonexistent for other farms. Administrative interference lowers overall incentives and as a consequence cotton-growing farmers make lower profits and achieve lower family incomes.

A third major limitation of the land reform is that managers of farms often have few choices for financing cotton sowing and marketing. In the **FAO 2007-2008 survey**, practically all

cotton growers among family dehkan farms (90%) signed forward contracts for cotton with non-bank financial agents who advance inputs for sowing in exchange for a share of the harvest and the exclusive right to gin and market the cotton. The combination of hukumat interference in farm sowing decisions to promote cotton and the monopsonistic position of so-called “futurists” in finance and marketing of cotton make the cotton production system in Tajikistan particularly onerous and often unprofitable for farms.

Conclusions

Land reform has had significant achievements in Tajikistan. The main achievement of land reform in Tajikistan has been the rapid recovery of agricultural production since 1997. Perhaps even more impressive has been the predominant role of productivity growth in the recovery of agricultural production in Tajikistan, primarily in household plots. Land reform has also most likely led to an improvement of rural family incomes through increases in land in household plots and family dehkan farms.

Despite these undeniable achievements, Tajik agriculture has achieved far less than other CIS countries with more successful land reforms for three reasons: First, the recovery of agriculture is built on a relatively tiny base in terms of land resources. Unreformed (enterprises and collective dehkan) farms still hold over half of sown land in Tajikistan. If dehkan farms and agricultural enterprises had achieved the same level of productivity as household farms in 2006 agricultural production in the country would have been 114% higher. If they had achieved only half the productivity level as household farms agricultural production in Tajikistan would have been 37% higher. A further consequence of the incompleteness of land reform is the financial crisis in Tajik agriculture.

A second reason that land reform has not lived up to its potential in Tajikistan is that the government has retained a large role for administrative intervention in farm decision making. Administrative controls on cotton sown area, as well as the monopsonistic position of “futurist” financiers cause farm returns to raising cotton to be less than they could be. Limited returns are an important factor in the continued fall in cotton yields and production. Other crops without heavy administrative intervention, including wheat, have shown increasing yields in the past few years. Amongst the major crops, only cotton yields have fallen so dramatically.

A final reason why land reform has not lived up to its potential in Tajikistan is that the failure to follow through on land reform has prevented the government from attending to the longer term needs of agriculture, rural development and natural resource management. Land reform is a basic first step toward the construction of a viable, sustainable agriculture that can be an adequate source of rural livelihoods in Tajikistan, though there are many further steps that will be necessary. The failure to take the first and most basic step preserves an underperforming agriculture, keeping the rural population on the brink of food insecurity, agriculture particularly susceptible to natural disaster and government without adequate tax revenues from the sector. The government’s preeminent concern with emergencies and basic livelihoods is shared by the donor community in Tajikistan. Ultimately, the important role of land reform to provide a basis for agricultural growth and rural livelihoods remains unfulfilled in Tajikistan.

1. Introduction: Purpose of the study

The overall purpose of this study is to determine the economic effects of land reform policies in Tajikistan on the country's agricultural sector and rural households. The study examines sectoral outcomes of land reform and discusses the effects of policies on farm level decision making, farm productivity, and rural incomes. The conclusions of the study point to the achievements and limitations of various land policies in Tajikistan based on an analysis of country-level statistics and quantitative farm-survey findings.

The study starts with an overview of Tajikistan's agriculture during transition. **Chapter 2** describes the country's geographical and regional profile and reviews changes in agricultural performance during the initial transition years. The chapter analyzes the changes in agricultural input use and output, showing how the Soviet growth phase changed to a transition collapse after 1991. **Chapter 3** then examines the government policy response to the agricultural production fall. This chapter analyzes the legal framework for land reform and the resulting changes in land tenure. **Chapter 4** combines quantitative data from official statistics and field surveys to trace the changes in performance of household plots, family farms, and agricultural enterprises associated with land reform policies. In **Chapter 5** the limitations of land reform are analyzed and their effects on farm and sectoral performance discussed, focusing on the conundrum of cotton farm debt and the "freedom to farm" issue. In **Chapter 6** some tentative conclusions of the study are discussed.

Tajikistan is one of the focus countries of Phase II of the EC/FAO Food Security Programme "Food Security Information for Action". The Programme was designed to strengthen national capacity in the collection, analysis and dissemination of food security information necessary for policy formulation. In Tajikistan there is a conspicuous lack of evidence-based policy dialogue with the government on the economic results and effectiveness of land and agricultural policies. Though the vast majority of rural inhabitants live in poverty and many are food insecure, a scientifically proper evaluation of the effects of land and farm policy reforms has yet to be done. Donor efforts on policy reform for rural areas have concentrated on informing farmers of their right to exit large farms, providing legislative advice to the government and on pilot projects in post-privatization support. This study is an attempt to fill this void by offering an evidence-based description of land reform and its consequences in Tajikistan.

Data sources

We examine the economic impacts of land reform through the prism of two substantially different datasets: the sectoral analyses throughout the study rely on official statistical data from the various yearbooks published by Tajikistan's State Committee of Statistics; in **Chapters 4 and 5** the official statistics are supplemented with information from recent farm-level and household-level surveys conducted by a number of international organizations in Tajikistan.

The changes induced by the reform on the sectoral level as discussed in **Chapter 2 (Tables 2.1-2.9, Figures 2.1-2.11)**, **Chapter 3 (Figures 3.1-3.2)**, Sections 4.1-4.3 in **Chapter 4 (Tables 4.1-4.4, Figures 4.1-4.16)**, and Section 5.1 in **Chapter 5 (Figure 5.2)** rely on the following statistical publications:

Sel'skoe khoziaistvo Respubliki Tadzhikistan: statisticheskii sbornik (Dushanbe: Gosudarstvennyi komitet statistiki Respubliki Tadzhikistan, 2001, 2002, 2003, 2004, 2005, 2006, 2007).

Tadzhikistan: 15 let gosudarstvennoi nezavisimosti: statisticheskii sbornik (Dushanbe: Gosudarstvennyi komitet statistiki respublik Tadzhikistan, 2006).

Statisticheskii ezhegodnik Respubliki Tadzhikistan (Dushanbe: Gosudarstvennyi komitet statistiki Respubliki Tadzhikistan, 2005, 2007).

Tajikistan in Figures 2008: Brief Statistical Digest (Dushanbe: State Committee on Statistics of the Republic of Tajikistan, 2008).

Official Statistics of the Commonwealth of Independent States, CD-ROM 2006-11 (Moscow: Statistical Committee of the CIS, 2006).

Narodnoe khoziaistvo Tadzhikskoi SSR: statisticheskii ezhegodnik (Dushanbe: Gosudarstvennyi komitet Tadzhikskoi SSR po statistike, 1961, 1965, 1971, 1972, 1976, 1977, 1978, 1979, 1980, 1981, 1984, 1985, 1988).

Narodnoe khoziaistvo Respubliki Tazhikistan v 1993 g: statisticheski ezhegodnik. (Dushanbe: Gosudarstvennoe statisticheskoe agenzstvo pri pravitel'stve Respubliki Tazhikistan, 1995).

Section 4.4 in **Chapter 4** and sections 5.2-5.3 in **Chapter 5** rely on data from four surveys conducted in the last five years:

- **2007 USAID/WB survey:** a survey of 1,500 respondents (collective dehkan farms, family dehkan farms, workers in corporate farms) in 15 districts conducted by USAID and the World Bank in February 2007. Main results published as *Knowledge, Attitudes and Practices of Farm Workers and Farmers Concerning Land Use Rights and Farmland Restructuring In Tajikistan: Baseline Survey and Qualitative Study Findings*, USAID, The World Bank, and the Government of Tajikistan, March 2008.
- **2008 ADB Small Farmers survey:** a survey of 330 “small farms”, i.e., family dehkan farms, in 13 cotton-growing districts in Khatlon and Sogd provinces. Organized in the first quarter of 2008 by the ADB Agricultural Sector Coordination Unit with the assistance of Legal Aid Center/Farmer Outreach projects funded by USAID, EC, DFID, and CIDA.
- **FAO 2007-2008 survey:** a survey of land users including 350 household plots and 135 family dehkan farms in Khatlon, Sogd and Region of Republican Subordination. The survey was carried out in the second half of 2007 and the first half of 2008 by FAO with EC financing. Results reported here for the first time.
- **2003 Tajikistan LSMS:** household-level Living Standard Monitoring Survey carried out by the World Bank as part of its world-wide LSMS program. Includes 4,000 respondents, both urban and rural. Not all respondents have land.

2. Agriculture in Tajikistan

Tajikistan is a highly agrarian country with a rural population of more than 70% of total and agriculture accounting for 65% of employment and around 25% of GDP (**Table 2.1**). As is typical of economies dependent on agriculture, Tajikistan has low income per capita. Back in the Soviet period (1990) Tajikistan was the poorest republic with a staggering 45% of its population in the lowest income “septile” (Uzbekistan, the next poorest in the Soviet ranking, had 34% of the population in the lowest income group). Today Tajikistan still has the lowest income per capita among the CIS countries: \$1,140 compared with nearly \$7,000 for Russia (WDI 2001 data). Tajikistan also had the highest rate of rural poverty in the Europe and Central Asia region in 2003: 76% of the population live below \$2.15 per day (PPP) compared with 72% in Kyrgyzstan and 55% in Uzbekistan.⁴ The highly agrarian structure of employment in the economy and the high rates of rural poverty imply that improvements in agricultural performance have substantial potential to improve the livelihoods of the rural population.

Table 2.1. The importance of agriculture for Tajikistan

	Share of rural population	Share of agricultural employment	Share of agriculture in GDP
1995	72.6	59.0	36.7
1996	73.2	59.1	36.0
1997	73.3	63.9	32.0
1998	73.4	60.7	25.1
1999	73.5	64.3	25.4
2000	73.4	64.9	27.0
2001	73.5	66.6	26.5
2002	73.6	67.6	22.2
2003	73.5	67.6	24.2
2004	73.6	66.6	19.2
2005	73.6	67.5	21.2
2006	73.7	67.1	21.5
2007	73.7	66.5	19.8
Average	73.4	64.7	25.9

With its hot climate and abundantly irrigated valleys, Tajikistan is a classical cotton-growing country. During the 1980s Tajikistan was the third largest cotton producer in the USSR (after Uzbekistan and Turkmenistan), accounting for more than 10% of raw cotton production and more than 25% of fine-fiber cotton. After independence Tajikistan began to diversify its crop production into wheat, but this did not lead to a major reduction of areas sown to cotton. Cotton production, on the other hand, shrank fairly dramatically, from 900,000 tons in the 1980s to about 500,000 tons after 2000, primarily due to a drop in yields (see **Figure 4.14**). Despite the shrinking harvest, cotton remains Tajikistan’s dominant agricultural export (80%-90% of the U.S. dollar value of agricultural exports), and on a national scale it is the second largest export commodity, accounting for 16% of total exports (it is outshined only by aluminum wire, which accounts for 60% of total exports).

Land reform has not changed the importance of agriculture in Tajikistan, nor has it significantly altered the emphasis on cotton cultivation as the main crop. Though land reform has had wide-ranging effects on agriculture with vast implications for the rural population, it is not the only influence on agriculture. In addition to land reform, Tajik agriculture has been deeply influenced by two main factors: geography and transition. This first chapter

⁴ *Growth, Poverty and Inequality: Eastern Europe and the Former Soviet Union* (WB, 2003), p. 242.

accordingly reviews the pre-existing state of agriculture in Tajikistan, emphasizing geography and patterns of agricultural transition in Tajikistan.

2.1. Geography of agriculture in Tajikistan

Tajikistan is an isolated, landlocked country bordered by Uzbekistan in the west, Kyrgyzstan in the north, China in the east, and Afghanistan in the south. The southern border with Afghanistan is marked along its entire length by two rivers – Panj in its higher course in the east and Amu Darya further west toward Uzbekistan (the name changes in the lower course of Panj after its confluence in south-western Tajikistan with Vakhsh and Kofarnihon rivers rising in the Pamir Mountains to the north). It is a highly mountainous country, with 93% of its surface area taken up by a complex of east-west and north-south ranges forming the Tyan-Shan and Pamir systems. Almost half the country is at altitudes of more than 3,000 m. Elevations range from 300 m above sea level in the Ferghana Valley to 7,495 m at the Ismail Somoni Peak in the Akademiya Nauk Range in Pamir. This is the highest point in all of the former Soviet Union, where it was known as Pik Kommunizma between 1962 and 1998 (**Map 2.1**) and earlier as Pik Stalina between 1932 and 1962. Huge glaciers covering more than 8,000 sq. km, mainly in the Pamir Mountains, are the primary source of water for Tajikistan's many rivers. Tajikistan is second only to Russia in its water resources among the CIS countries, and its glaciers also feed the rivers of Uzbekistan to the west.



Map 2.1. Topographic map of Tajikistan (source: GRID-Arendal).

Agriculture in this mountainous country is confined primarily to irrigated river valleys. There are only four well-defined valley systems in Tajikistan (**Map 2.1**):

- (1) the Ferghana Valley in the north of the country along the Syr Darya (this is the south-western part of the valley that stretches from Uzbekistan into Tajikistan);
- (2) the broad Khatlon lowlands in the south-west, extending from Kulyab in the east to the border with Uzbekistan in the west;
- (3) the Gissar Valley between Dushanbe and Tursunzade, just north of Khatlon;
- (4) the narrow strip of the Zeravshan Valley extending east to west between Ferghana and Gissar valleys.

Tajikistan is located at the border of the moderate and the subtropical zones, between deserts and semi-deserts in the west and huge mountain ranges and plateaus in the east. The climate in Tajikistan is warm and dry and arable agriculture in water-abundant river valleys was maximized by the traditional expedient of extending artificial irrigation networks. Arable agriculture in Tajikistan has always relied heavily on irrigation. **Figure 2.1** shows how the irrigation-ready area increased from 450,000 hectares in 1960 to 720,000 hectares in 2007. The share of cultivable land (arable plus land in perennials) covered by irrigation networks increased over time from 50% in the 1960s to 70% in 1990. However, there has been little expansion of irrigation after 1990, and today irrigation-ready areas cover about 75% of cultivable land.

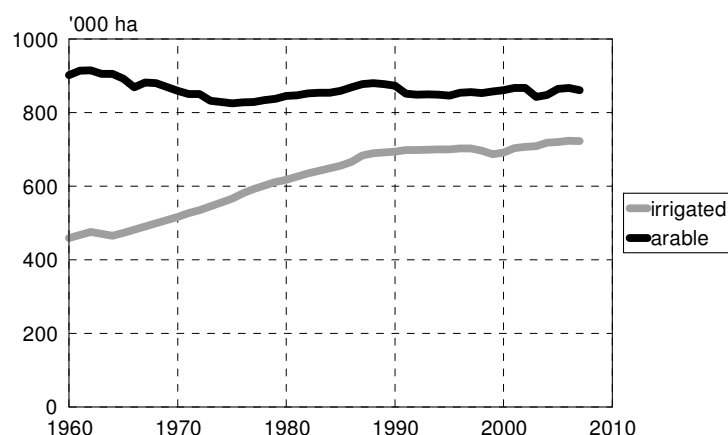
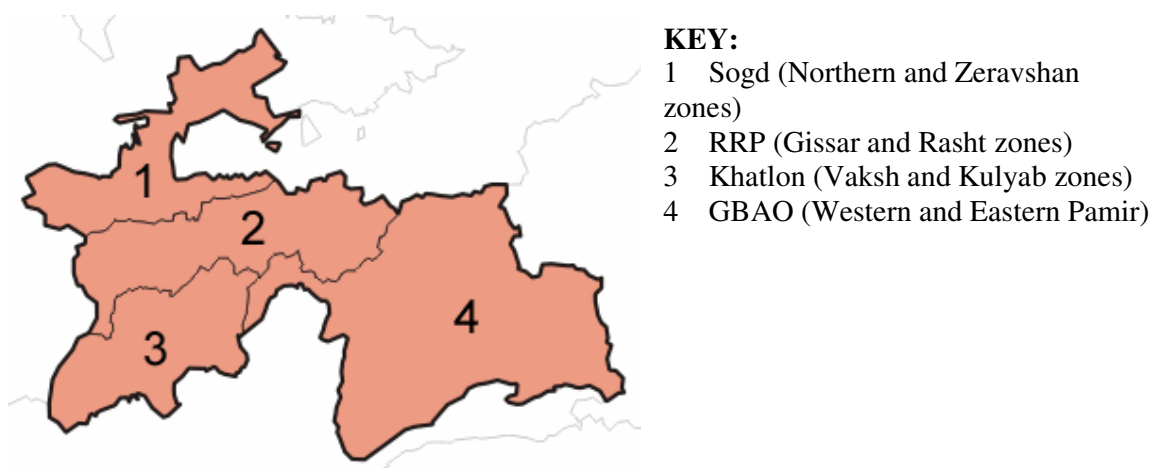


Figure 2.1. Arable land and irrigation-ready area in Tajikistan, 1960-2007 (includes land in household plots).

The highly incised mountainous terrain of the country puts a special emphasis on the need for proper land, pasture, and forestry management to prevent erosion and optimize agricultural uses. Strong, high-quality governance is essential for achieving these goals, which is difficult to find in a transition country like Tajikistan. The importance of this challenge in Tajikistan is perhaps higher than in other mountainous countries of the CIS (Kyrgyzstan, Armenia and Georgia) where the plains and valleys are more geographically separated from the mountains.

Agro-climatic zones of Tajikistan

Tajikistan is divided into four administrative regions: Sogd province (oblast in Russian, viloyat in Tajik) in the north (1 in **Map 2.2**); Khatlon province in the south-west (3 in **Map 2.2**); Gorno-Badakhshan Autonomous Province or Oblast (GBAO), spanning the entire eastern half of the country (4 in **Map 2.2**); and one provincial-level division comprising 13 districts governed directly from the capital of Dushanbe (Region of Republican Subordination, or RRP – Raiony Respublikanskogo Podchineniya in Russian; 2 in **Map 2.2**).



Map 2.2. Administrative division of Tajikistan (Source: Wikipedia, the Free Encyclopedia)

Each of the four administrative regions in turn is divided into two distinct agro-climatic zones differentiated by topography (**Table 2.2**). Sogd is divided into Northern Tajikistan with its relatively wide Ferghana Valley and the Zeravshan zone consisting of the long narrow Zeravshan valley with high mountain ranges on both sides. Khatlon is divided into the western part comprising the large Vakhsh lowland and the more mountainous eastern part – Kulyab. The long strip of the RRP is divided into a relatively mild west (the Gissar Valley) and the much more rugged east – the Rasht zone rising rapidly toward the Pamir Mountains (east of Novabad in **Map 2.1**). GBAO (the Pamir region) is divided into Western Pamir that supports some crop agriculture and the cold high-elevation desert of Eastern Pamir, where only sheep survive. **Table 2.3** schematically describes the profile of agriculture across the eight zones.

Table 2.2. Administrative and agro-climatic division of Tajikistan

Key on map	Province	Location within Tajikistan	Area (sq km)	Population (2007)	Capital	Agro-climatic zone	Location within the province
1	Sogd	North	25,400	2,132,100	Khujand	Northern Zeravshan	North South
2	RRP	Center	28,600	1,606,900	Dushanbe	Gissar Rasht	West East
3	Khatlon	South-west	24,800	2,579,300	Kurgan-Tyube	Vakhsh Kulyab	West East
4	GBAO	East	64,200	218,000	Khorug	Western Pamir Eastern Pamir	West East

Source: Population and area from State Statistical Committee of Tajikistan.

Table 2.3. Profile of agricultural production across the eight agro-climatic zones of Tajikistan

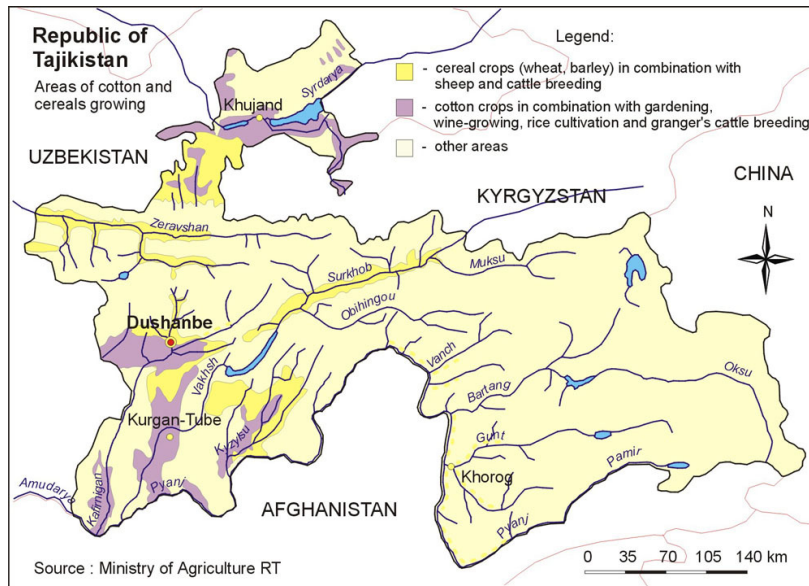
Province	Agro-climatic zone	Valleys	Agriculture
1 Sogd (N)	Northern (N)	Ferghana	Cotton , cereals, livestock, horticulture
	Zeravshan (S)	Zeravshan	Tobacco, cereals, livestock, horticulture
2 RRP (Center)	Gissar (W)	Gissar	Cotton , livestock, horticulture, cereals
	Rasht (E)	Surkhob	Livestock, cereals, horticulture, cotton
3 Khatlon (SW)	Vakhsh (W)	Lower Kofarnikhon, Vakhsh, Panj	Cotton , cereals, livestock, horticulture
	Kulyab (E)	Yakhsu-Kyzylsu	Cotton , cereals, livestock, horticulture
4 GBAO (E)	Western Pamir (W)		Livestock, some crop farming in river valleys
	Eastern Pamir (E)		Sheep (mountain pastures)

In the north of the country, Northern Tajikistan is the part of the Sogd Province that stretches as a long finger straddling the south-western part of the Ferghana Valley along the Syr Darya (the eastern part of the valley is in Uzbekistan). Enclosed by two east-west mountain ranges – Kuramin Range from the north and Turkestan Range from the south, the valley has rich alluvial soil and the natural conditions are favorable for cotton and other warm-climate crops (grapes, apricots, etc.). The southern part of Sogd – the base on which the northern “finger” rests – is the Zeravshan zone that stretches from east to west in a narrow valley along the Zeravshan River, edged by the Turkestan Range in the north and the Zeravshan Range in the south.

South-Western Tajikistan – Khatlon Province – stretching south of the Gissar Range and west of Pamir is a region of wide river valleys (Lower Kofarnikhon, Vakhsh, Kyzylsu) separated by mountain ridges that fan out in the south-westerly direction from the mountain system in the north. The western part of Khatlon enjoys the warmest climate in the country. Fine-fiber cotton and other subtropical crops flourish on large irrigated areas in Lower Kofarnikhon and Vakhsh valleys in western Khatlon. The eastern part of the province – Kulyab – is more mountainous and less hospitable for agriculture. It has only one relatively small valley along the Yakhsu and Kyzylsu rivers around the town of Kulyab where cotton farming thrives.

Central Tajikistan – administratively designated as the Region of Republican Subordination (*Raiony Respublikanskogo Podchineniya – RRP*) consisting of 13 districts (formerly the Karategin Province) – stretches in a long band from east to west, between the Gissar and Zeravshan mountain ranges in the north, the Vakhsh and Darvaz ranges in the south, and the western edge of Pamir Mountains in the east (Akademiya Nauk Range). This mountainous belt creates a natural barrier between the Khatlon lowlands in the south and the northern valleys of Zeravshan and Ferghana in Sogd Province. Natural vegetation in Central Tajikistan ranges from semi-desert to mountain meadows and pastures. The elevations rapidly rise from the western part (Gissar) to the rugged Gissar-Alay Mountains in the eastern part (Rasht). Crops flourish mainly in the the Gissar Valley, which stretches from Dushanbe to the border with Uzbekistan (Tursunzade). In the Rasht zone crop farming is restricted to the long and narrow valley that stretches from east to west following Surkhob River on its way to Vakhsh River in Khatlon Province further south-west.

The Pamir Mountains cover the entire eastern half of the country, forming the Gorno-Badakhshan Autonomous Province (GBAO). While Western Pamir has some river valleys suitable for cultivation at altitudes up to 3,700-4,200 m as well as livestock, Eastern Pamir is distinguished by the driest and coldest climate in Tajikistan. This is a cold high-mountain desert, without trees and hardly any vegetation, suitable only for sheep.



Map 2.3. Cotton and cereal growing regions in Tajikistan.

Agriculture in the hot Ferghana, Gissar, and Khatlon lowlands (north, center-west, and south-west, respectively) is heavily dependent on irrigation. The warm temperatures and abundance of rivers in Ferghana, Khatlon, and Gissar valleys make these the choice regions for cotton and to a certain extent rice. **Map 2.3** clearly shows these main cotton-growing regions in Tajikistan (purple). In Khatlon, cotton is restricted to the three north-south river valleys: Kofarnihon (west), Vakhsh (center), and Yakhsu-Kyzylsu (east). There is also some cotton in central RRP along the south-western approaches of the Surkhob River (**Map 2.3**) to the cotton-rich Gissar Valley. Still, Rasht mainly specializes in non-irrigated agriculture – livestock, cereals, and orchards.

Zeravshan Valley enjoys relatively high rainfall from the surrounding mountain ranges, but the temperatures are too low for successful cotton agriculture. Agriculture in Zeravshan Valley is based on tobacco, cereals, horticulture, and livestock.

Rain-fed agriculture is possible on the southern slopes of the Gissar Range (stretching north of Dushanbe), in the Zeravshan and Gissar valleys (where it supplements intensively irrigated agriculture), in the eastern part of Central Tajikistan (Rasht zone around Novabad in **Map 2.1**), and on the mountain slopes of Kulyab zone above 500 m. These are the regions where cereals (except rice), tobacco, and flax are grown. The cereal-growing regions are shown in yellow in **Map 2.3**.

Fruit (mainly apples and apricots) and grapes are successfully grown in the mountains up to altitudes of 3,000 m above sea level. A particularly high concentration of orchards is observed in Northern Tajikistan.

Livestock is successfully raised all over the country, including both East and West Pamir. Sheep grazing (mainly karakul sheep) is prevalent in the northernmost part of Sogd (Kuramin Mountains) and in the mountainous parts of Khatlon rising between the major north-south river valleys. In many regions livestock supplements crop farming. It is of secondary

importance in cotton-growing areas, but in mountains livestock is often the main agricultural enterprise. Pastures account for more than 75% of agricultural land in Tajikistan (see **Figure 2.5**), a feature typical of all Central Asian countries, where cultivable land is a relatively small part of agricultural land – much less than in the European CIS and even in the mountainous Trans-Caucasus countries (see **Table 2.7**).

Regional structure of agriculture

The main agricultural areas of Tajikistan are Khatlon in the south-west, Sogd in the north and the Gissar zone in the western part of RRP. **Table 2.4** presents numbers on the importance of agriculture across the four provinces of the country, giving the share of each region in Gross Agricultural Output (GAO) and in main agricultural resource endowments – agricultural land, cropped area, number of livestock, and population (as a proxy for labor endowment). The data for agricultural land and cropped area are summarized graphically in **Figures 2.2, 2.3**.

Table 2.4. Share of agriculture across Tajikistan’s four provinces (by commodity, 2006 data)

	Sogd	Khatlon	RRP	GBAO	Tajikistan
GAO	25	45	26	4	100
Agricultural land	24	33	26	17	100
Sown area (all crops)	32	49	18	1	100
Cattle	27	40	26	7	100
Sheep	31	39	21	8	100
Population	33	39	24	4	100

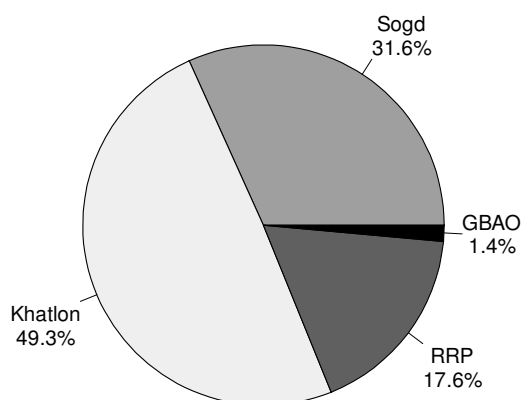


Figure 2.2. Structure of sown area by region, 2006.

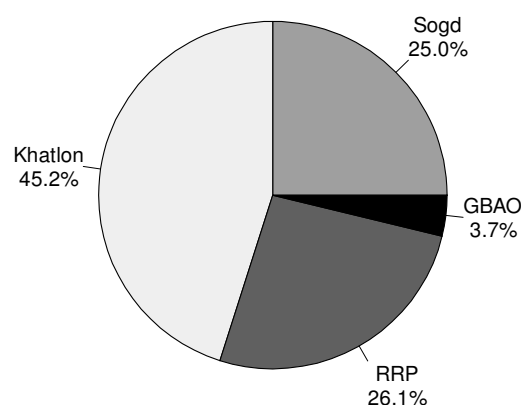


Figure 2.3. Structure of GAO by region, 2006.

GBAO is the largest province by territory (see **Map 2.2**), but because of adverse natural conditions it has the smallest population and the smallest agriculture. There is very little crop agriculture in GBAO, which mainly relies on livestock (7%-8% of the country’s herd of cattle and sheep). At the other extreme, Khatlon Province has the largest population (2.5 million), and also the largest agriculture in Tajikistan, accounting for 45% of GAO, 60% of areas under cotton, 50% of areas under cereals, and 40% of cattle and sheep (data for 2005-2006). While Sogd and RRP make roughly the same contribution to agricultural production (around 25% of GAO), Sogd is second in importance in cotton (30% of area under cotton), while RRP is a distant third (only 8%). Overall, the area sown to cereals is roughly the same in Sogd and RRP. Horticultural crops – potatoes, vegetables, melons – are evenly distributed among the three provinces. Orchards and vineyards are grown mainly in Sogd and Khatlon, and RRP is a minor player in perennials. There is a sharp inversion between fruit orchards and grape

vineyards between Sogd and Khatlon: Sogd has over 50% of fruit orchards, while Khatlon has over 50% of vineyards.

Table 2.5. Structure of agricultural production (percent of physical output)

	Sogd	Khatlon	RRP		GBAO	Tajikistan
			Gissar	Rasht		
Cereals	21	59	15	3	1	100
Rice	44	36	19	0	0	100
Cotton	30	59	11	0	0	100
Flax	5	51	36	6	1	100
Tobacco	93	5	0	1	0	100
Potatoes	35	24	13	22	6	100
Vegetables	36	34	27	2	2	100
Fruits	42	28	17	7	5	100
Grapes	32	43	24	0	0	100
Milk	36	40	16	6	2	100
Meat	25	46	17	6	6	100

Table 2.5 shows some regional patterns of agricultural production, highlighting the negligible role of GBAO and in particular emphasizing the huge differences in levels of agriculture between the two parts of RRP – Gissar (the western lowland part of Central Tajikistan) and Rasht (the eastern mountainous region). Potatoes grown by rural households for own consumption and sales appear to be only significant crop in Rasht. Practically the total agricultural production of RRP – both crops and livestock products – originates from the eastern part centered on the Gissar Valley around Dushanbe. Khatlon is the main producer of cereals, cotton, grapes, and flax (to the extent that this oil seed is still produced in Tajikistan). It is also the leader in livestock production (milk and meat). Sogd ranks first in the production of rice, tobacco, and fruits. Tajikistan’s entire tobacco harvest comes from the Zeravshan Valley in Sogd. Gissar zone (the western part of RRP) produces significant quantities of flax, grapes, and vegetables. It also grows rice and cotton, although in quantities much smaller than Khatlon and Sogd.

Table 2.6. Agricultural productivity measured by GAO per hectare of agricultural land across Tajikistan’s regions (somon/ha)

Province	Productivity of land, somoni/ha	Zone	Productivity of land, somoni/ha
Khatlon	724	Vakhsh (W)	916
		Kulyab (E)	505
Sogd	540	Northern (N)	784
		Zeravshan (S)	354
RRP	540	Gissar (W)	839
		Rasht (E)	221
GBAO	100	West Pamir	344
		East Pamir	11
Tajikistan	526	Tajikistan	526

Agricultural productivity levels are closely correlated with levels of agricultural production. An aggregate measure of productivity, calculated as gross agricultural output (GAO) per hectare of agricultural land, is presented for Tajikistan’s regions in **Table 2.6**. Khatlon, with a 45% contribution to the country’s GAO, has the highest productivity (724 somoni/ha), while Sogd and RRP, each contributing 25% to GAO, tie for the second place by productivity with around 540 somoni/ha. GBAO with its marginal agricultural production trails far behind with just over 100 somoni/ha, all of which basically originates in Western Pamir (**Table 2.6**). In

each of the three agricultural provinces, the main cotton growing areas – Vakhsh, Northern Tajikistan, and Gissar – achieve much higher levels of output per hectare than the other areas (Kulyab, Zeravshan, and Rasht, respectively; see **Table 2.6**).

2.2. Agricultural transition in Tajikistan: changes in output and inputs

The second important aspect of Tajik agriculture that predates effective land reform and farm restructuring in the country is the dramatic fall in agricultural output of the early transition period. Tajikistan’s agricultural development (**Figure 2.4**) exhibits four distinct stages – intense Soviet growth (up to 1980), stagnation (1980-1990), transition decline (1991-1997), and finally recovery (since 1998). As in other CIS countries, the transition phase of Tajik agriculture has involved two distinct stages. The first stage began in 1990-91 with the disintegration of the traditional Soviet agricultural system. Under this system, supplies of inputs to and purchases of outputs from collective and state farms were ensured at fixed prices. With the breakdown of this system of price and supply controls, prices of inputs rose faster than procurement prices, and farms could no longer afford to purchase inputs on the scale they had in the past. Purchases of fertilizer, pesticides, seeds, and feed fell abruptly, causing a dramatic fall in agricultural output. In an anxious search for “working capital” for sowing, collective and state farms sold off farm assets such as farm machinery and livestock. Only agricultural land and labor seem to have been unaffected by the transition. As in other Central Asian (and Transcaucasian) countries, agricultural land remained relatively constant in Tajikistan, while agricultural labor continued to increase over the entire period of transition.

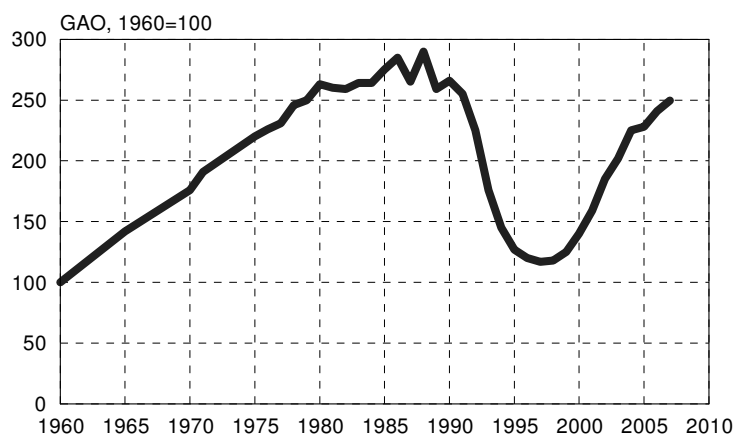


Figure 2.4. Growth of agricultural production in Tajikistan, 1960-2007 (GAO in percent of 1960).

The dramatic fall in agricultural production after 1991 spurred the government to enact reforms in the agriculture sector, the subject of **Chapter 3**. The second stage of transition, the recovery of agricultural output since 1998, is intimately linked with these reforms, which have involved the redistribution of land from collective and state farms to dehqan and household farms. The enormous effects of these changes are the subject of **Chapter 4**, while the limitations of reform are the subject of **Chapter 5**.

Agricultural production relies on three main resources: land, labor, and animals. In addition, production also depends on availability of farm machinery and purchased inputs (such as animal feed and fertilizers). The following sections describe the fall in agricultural input use that resulted in a 50% decrease in production in Tajikistan in 7 short years.

Agricultural land

Figure 2.5 shows the stock of agricultural land since 1960. Total agricultural land increased gradually and slightly from 3.8 million hectares in 1960 to 4.3 million hectares in 1990-1995 and then declined back to 4.0 million hectares in 2007. The striking feature of the structure of agricultural land in Tajikistan is the predominance of pastures, which account for more than 75% of agricultural land over the entire period. This feature is not unique to Tajikistan, however: it is typical of all Central Asian countries, where cultivable land is a relatively small part of agricultural land – much less than in the European CIS and even in the mountainous Trans-Caucasus countries (**Table 2.7**).

The structure of cultivable land in Tajikistan – arable land and land under orchards and vineyards – is shown separately “through a magnifying glass” in **Figure 2.6**. Cultivable land has generally remained steady at around 1 million hectares since 1990, and the slight decline in agricultural land in recent years is thus the outcome of declining pastures.

Table 2.7. Share of arable land in agricultural land in CIS by region (in %, average 1980-2004)

Central Asia	High-pasture countries	Transcaucasia	Medium-pasture countries	European CIS	High-arable countries
Kazakhstan	20	Azerbaijan	38	Belarus	66
Kyrgyzstan	17	Armenia	36	Moldova	71
Tajikistan	19	Georgia	26	Russia	61
Turkmenistan	4			Ukraine	81
Uzbekistan	17				

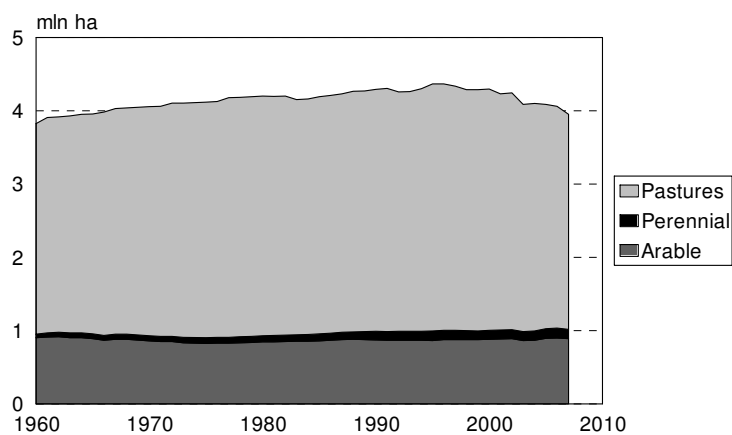


Figure 2.5. Composition of agricultural land, 1960-2007 (million hectares).

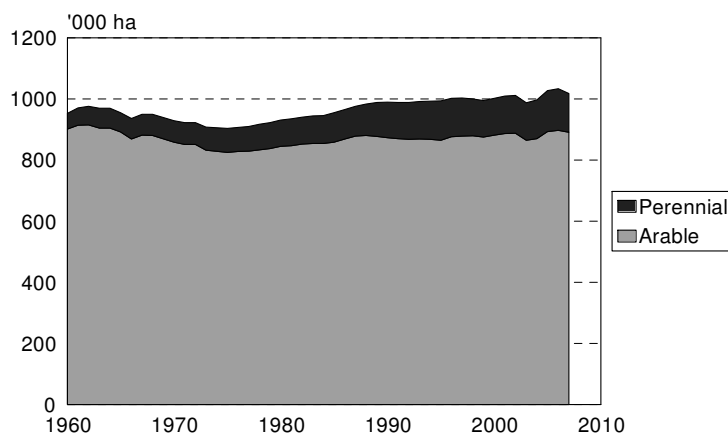


Figure 2.6. Composition of cultivable land, 1960-2007 ('000 hectares). Cultivable land is divided into arable land (bottom gray layer) and land in orchards and vineyards (top black layer); arable includes fallow.

Agricultural labor

Agricultural labor – the number of people employed in agriculture, including the self-employed – steadily increased since 1980, rising from 600,000 to over 1.4 million in 2007 at an annual growth rate of 3.2% (**Figure 2.7, Table 2.8**). The increase in agricultural labor is very closely correlated with rural population growth (the correlation coefficient is 0.98), which also grew at an annual rate close to 3% since 1980. Rural population growth appears to be the main determinant driving the increase in agricultural labor, although the faster growth of agricultural labor (3.2% compared with 2.6% per annum for the rural population) seems to suggest that other drivers are also at work. Land allocated to individual use may be one of such additional drivers (see **Chapter 3**).

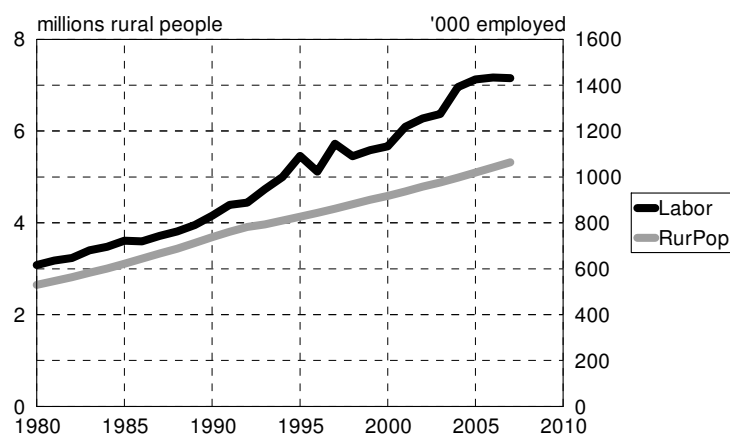


Figure 2.7. Growth of agricultural labor and rural population, 1980-2007.

Table 2.8. Agricultural labor and rural population in Tajikistan, 1980-2007

	Employed in agriculture, thousands	Rural population, thousands	Total population, thousands
1980	615.8	2646.7	4006.3
1985	721.9	3111.7	4630.8
1990	831.0	3684.4	5361.0
1995	1092.3	4137.2	5701.4
1996	1023.5	4220.7	5769.1
1997	1145.0	4309.6	5875.8
1998	1090.0	4407.0	6001.3
1999	1117.5	4501.8	6126.7
2000	1133.0	4590.1	6250.0
2001	1218.2	4685.0	6375.5
2002	1254.6	4786.6	6506.5
2003	1275.0	4882.2	6640.0
2004	1391.0	4988.5	6780.4
2005	1425.0	5095.5	6920.3
2006	1433.0	5206.1	7063.4
2007	1430.0	5319.0	7215.7

Livestock

A third resource contributing to agricultural production is the livestock head count. The livestock in Tajikistan is a mix of cattle and sheep, with over 1 million head of cattle and around 3 million head of sheep and goats. **Figure 2.8** shows that the dynamics of the livestock herd (in standard head, or “cow equivalents”) since 1990 closely replicates the behavior of GAO: a steep transition decline starting in 1991 changes to an upward trend after 1998. About

80% of the livestock herd is cattle and 18% is sheep (calculated in “cow equivalents” with a weight of 0.1 head of sheep per 1 cow equivalent). These proportions have remained fairly steady over time, with a slight increase in the proportion of cattle since 1980 at the expense of a dramatic decline in the proportion of poultry.

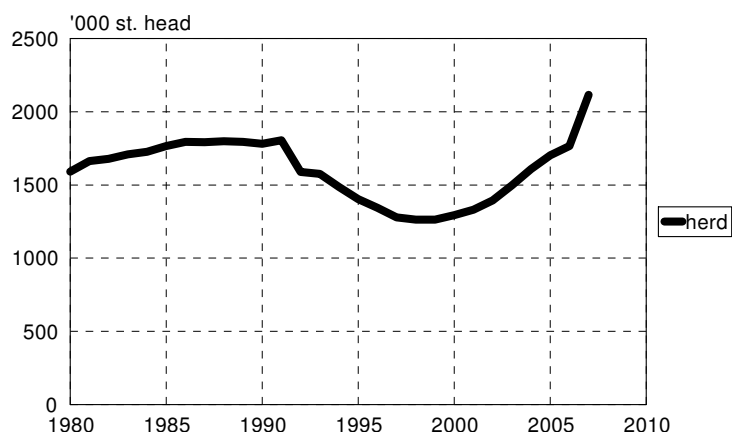


Figure 2.8. Livestock herd, 1980-2007 ('000 standard head).

The increase in the livestock herd observed in **Figure 2.8** up to 1991 is a continuation of a long-term trend that persisted over several decades during the Soviet period. Thus, the livestock herd in Tajikistan grew from 1 million standard head in 1960 to over 1.5 million standard head in 1980 and peaked at 1.8 million head in 1991, just before the transition collapse. The share of livestock production in GAO closely tracked the changes in herd size, rising from about 30% in 1965-1975 to 35% in 1989-1992. The shrinking herd size after 1992 led to a steep drop in the share of the livestock sector to 15% of GAO in 1997, and then the livestock share began to rise in response to the recovery in animal numbers. In 2005-2007 it again approached the 30% level from 1965-1975.

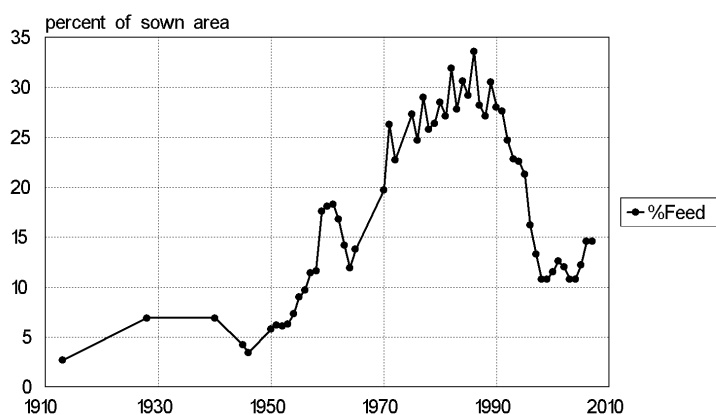


Figure 2.9. Area in feed crops, 1913-2007 (percent of sown area).

In contrast to the increasing livestock numbers, the area under feed crops in Tajikistan today is on the level of the late 1950s, about 10%-15% of sown area, rather than the 30% of sown area achieved in the late 1980s (**Figure 2.9**). The level of feed harvested has also fallen sharply and in 2007 it is merely 15%-30% of the harvest in 1990 (depending on the particular feed crop). The decline in feed crops combined with the decrease of 300,000 hectares (about 10%) in pastures since 1997 (see **Figure 2.5**) indicate a sharp contraction of the feed base for both cattle and sheep.

Farm machinery

Farm machinery inventories literally collapsed after 1990 following decades of robust growth in the Soviet era (**Figure 2.10**). The number of tractors shrank from 37,000 in 1991 to 17,000 in 2007; the number of grain harvesters dropped from a high of 1,500-1,600 in the early 1990s to 850 in 2007; and the number of cotton harvesters skidded from 3,000 in 1991 to 500 in 2007.

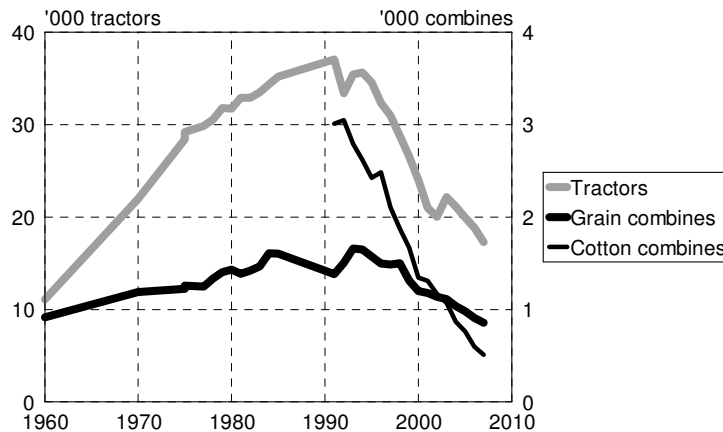


Figure 2.10. Farm machinery stocks, 1960-2007 (in thousand units).

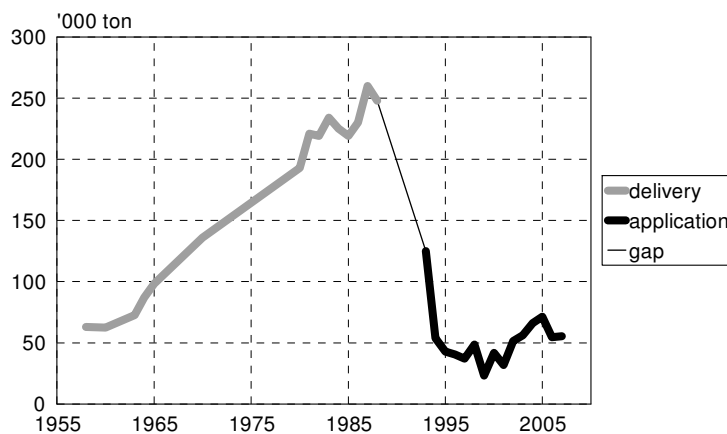


Figure 2.11. Fertilizer use 1958-2007 ('000 tons nutrient matter).

Fertilizer use

A similar downward pattern is observed for fertilizer use, although the data here are even less complete or consistent than for farm machinery. **Figure 2.11** shows two disjointed curves approximating fertilizer use in Tajikistan. The gray curve up to 1988 represents fertilizer quantities delivered to agriculture; the black curve starting in 1994 represents quantities applied by farms (enterprises up to 2000, all farms from 2001 to 2007). We clearly observe a robust increase of fertilizer deliveries during the Soviet period. In the transition period, fertilizer use appears to have dropped compared to Soviet levels, but it is difficult to make firm quantitative conclusions on this count because of inconsistent definitions of fertilizer use between the two periods. After 1994, fertilizer application seems to have stabilized at 48,000 ton on average. Given an average cropped area of 850,000 ha in this period, we estimate fertilizer application rates at around 56 kg per hectare of sown area. These rates appear to be lower than the averages in the early 1960s (around 80-100 kg/ha), and they are also much

lower than the fertilizer consumption rate in the U.S. (95 kg/ha in 1987-1988). A different set of estimates based on FAOSTAT indicates that in 2000-2002 the consumption of fertilizer in Tajikistan was on a par with the rest of CIS and the non-EU countries in Europe (around 20-30 kg nutrient matter per hectare of arable land), but much lower than in the U.S. (110 kg per hectare of arable land) or the EU-15 (210 kg per hectare of arable land).

* * *

The cumulative result of the collapse of purchased inputs and feed availability was a steep fall in agricultural production (as measured by the index of GAO – Gross Agricultural Output; see **Figure 2.4**). By 1997 agricultural production in Tajikistan had fallen to levels not seen since the early 1960s. The perception of the transition decline in the 1990s was undoubtedly all the more negative because it was preceded by decades of steady agricultural growth during the Soviet period, as the GAO index trebled between 1960 and 1988, despite the relative slowdown during Gorbachev’s rule in the 1980s.

Summarizing the discussion of outputs and resource use in post-Soviet Tajikistan, we can say that agricultural production fell largely due to the fall in production of purchased inputs. The use of purchased inputs, including farm machinery, feed, and fertilizers, seems to have undergone severe shrinkage through the mid-1990s. Livestock numbers showed a similar pattern of change; agricultural labor increased unabated, primarily due to rapid population growth; arable land declined moderately during the 1990s, while irrigation did not expand much after independence. These results are schematically summarized in **Table 2.9**.

Table 2.9. Schematic patterns of change in Tajik agriculture after 1990

Variable	Behavior through 1997
Agricultural output	Decline
Livestock	Decline
Agricultural labor	Increase
Arable land	Stable
Irrigation	Stable
Farm machinery	Collapse
Fertilizer	Apparent decline

3. Land reform legislation and changes in land tenure in Tajikistan

The record of agricultural growth in Tajikistan suggests that the motivation for agricultural and land reform did not stem from the acknowledged failure of Soviet agriculture. There was little reason for the leadership of the country to change the Soviet system based on the pre-1980 results. The motivation for reform came only after 1990, for this is when the Soviet agricultural and political systems in Tajikistan dissolved. Initial stagnation in agricultural production that began in 1980 with the general weakening of the Soviet system changed to truly dramatic declines after 1990, when hyperinflation and general transition disruptions were followed by mounting farm losses, accumulation of farm debt, and falling real wages in agriculture. The decline in GDP and agricultural production of these years was intensified by a civil war that began in May 1992 and ended with a peace accord under UN auspices in 1997.

The dissolution of the Soviet agricultural system after 1990 and the production decline pointed to the need for reform. However, the Tajik approach to this issue has been gradual and limited. Agricultural land is at the center of the reform agenda in any transition country, and in this chapter we discuss land reform policy and show how the structure of land use has changed in Tajikistan since the Soviet period.

The first legal acts on land reform and farm restructuring in Tajikistan were issued in 1992, but land reform began in earnest only in 1995, with a presidential decree allocating additional land to household plots. In parallel (1995-1996) Tajikistan moved to reorganize the traditional collective and state farms into new corporate forms in the hope that restructuring would improve productivity in a notoriously inefficient sector. When this largely cosmetic restructuring failed to produce efficiency gains, the country switched the focus of its attention to *dehkan* (peasant) farms as a model of family farming. Since 1999, *dehkan* farms have largely supplanted the corporate farms – limited liability companies, leaseholding enterprises, joint stock companies, agricultural cooperatives – as the main agricultural land users. Unfortunately, roughly one-third of the 30,000 *dehkan* farms today are organized as *collective dehkan farms*, which seem to perpetuate the *kolkhoz* form of organization despite the new name. Nevertheless, land reform efforts have irrevocably changed Tajikistan's agriculture from the Soviet dual system of large-scale farm enterprises and tiny household plots to a tripartite farm structure spanning the entire spectrum of sizes from small (though enlarged) household plots through mid-sized *dehkan* farms to remnants of large corporate farms.

3.1. Legal framework for land reform and farm reorganization⁵

Land in Tajikistan remains in exclusive state ownership (Article 13 of the Constitution, September 1999). Land cannot be privatized, but use rights in land can be transferred to individual or "private" use. The essence of land reform in Tajikistan is therefore reallocation of state-owned agricultural land among producers through the mechanism of land use rights.

⁵ This section draws in part on Jennifer Duncan, *Agricultural Land Reform and Farm Reorganization in Tajikistan*, RDI Reports on Foreign Aid and Development #106, Seattle, WA, May 2000; and Murat Aminjanov, *How Many Farms Are There In Tajikistan?* Policy Brief 3, European Commission "Support to the Development, Implementation and Evaluation of Agricultural Policy of Tajikistan" Project, Dushanbe, October 2007.

In this section we review the main land reform legislation, which is presented in chronological order in **Table 3.1**.

Land reform efforts began in 1992, with the Law “On Dehkan Farms” and the Law “On Land Reform.” The Law “On Land Reform” defined the goals of land reform in Tajikistan in terms of creating a level playing field for farms of all organizational forms and achieving higher production levels through efficient use of land. The Law “On Dehkan Farms” established the right of every citizen to create an independent peasant (dehkan) farm outside the collectivist framework, primarily from the district’s reserve land. The law called for the division of the traditional farm enterprises (*kolkhozes* and *sovkhozes*) into individual, inheritable land shares, to be certified by proper documentation. It also established the right of every member of a farm enterprise to a share in non-land assets. The Law “On Land Reform” added the requirement that farm enterprises be restructured into other organizational forms, such as dehkan farms, lease share enterprises, and agricultural cooperatives.

Table 3.1. Main legal acts relating to land reform and farm reorganization in Tajikistan

Date	Document	Title
5 Mar 1992	Law No. 594	“On Land Reform”
15 May 1992	Law No. 421	“On Dehkan (Peasant) Farm”
1 Oct 1993	Government Resolution No. 499	Organization of dehkan (peasant) farms
6 Nov 1994	Constitution of Tajikistan, Article 13	“Land ... and other natural resources are in exclusive ownership of the state...”
9 Oct 1995	Presidential Decree No. 342	Allocation of 50,000 hectares to household plots
11 Oct 1995	Government Resolution No. 621	Restructuring of kolkhozes, sovkhozes, and other agricultural enterprises
25 Jun 1996	Presidential Decree No. 522	Reorganization of agricultural enterprises
13 Dec 1996	Law No. 326	Land Code
1 Dec 1997	Presidential Decree No. 874	Allocation of 25,000 hectares to household plots
22 Jun 1998	Presidential Decree No. 1021	“On Ensuring the Right to Land Use”
15 Jul 1997	Government Resolution No. 294	State control of land use and protection
4 Feb 1999	Government Resolutions Nos. 29, 30	Simplified procedure for creation and registration of land use rights; simplified procedure for determination and registration of land shares
12 May 2001	Law No. 20	“On Land Use Planning”
12 May 2001	Law No. 18	“On Valuation of Land”
23 Apr 2002	Law No. 48	“On Dehkan (Peasant) Farms”
15 Apr 2003	Presidential decree No. 1054	“On the mechanism for settling the debts of reorganized agricultural enterprises and enterprises undergoing reorganization”
23 Dec 23 2003	Government Resolution No. 542	“On settling the debt of reorganized agricultural enterprises and enterprises undergoing reorganization”
4 Mar 2005	Approved by the President	Strategy for cotton farm debt resolution in Tajikistan
30 Jun 2006	Presidential Decree No. 1775	“Rule for reorganizing and reforming agricultural enterprises”
5 Mar 2007	Government Resolution No. 111	“Plan of measures for cotton farm debt resolution in Tajikistan for 2007-2009”

In October 1993, detailed provisions on organization of dehkan farms were approved, setting procedures for the allotment of land to a dehkan farm. Dehkan farms would be allocated land from the state reserve or from the local farm enterprise in the process of its reorganization. This resolution was the first document that operationalized the concepts of land reform in Tajikistan.

Strengthening of the extremely active sector of small household plots has always been one of the priorities of the land reform program. Household plots were increased substantially in two stages. In the first stage (October 1995) 50,000 hectares of arable land were transferred from farm enterprises to household plots, thus increasing the area of arable land in household plots from 8% to 15% of the total. In the second stage (December 1997), an additional 25,000 hectares was allocated raising the area of arable land in household plots to 18% of the total. This additional land was allocated by force of two Presidential Decrees, and it is accordingly known as “Presidential Lands” in the vernacular.

In October 1995, a new government resolution initiated the phase of reorganization of traditional large-scale farms. It called for the restructuring of unprofitable large farms into lease share enterprises, cooperatives, and dehqan farms. It also required profitable state farms to reorganize into collective farms. This decree was periodically followed over the years by similar decrees and resolutions, setting specific targets for reorganization of collective and state farms by region and thus gradually eliminating the sector of traditional farm enterprises.

The June 1996 Presidential Decree “On reorganization of agricultural enterprises and organizations” is considered by many in Tajikistan to be the fundamental document for establishing the right of individual members and workers in farm enterprises to land shares, although this appears to have been accomplished by the Law “On Dehqan Farms” back in 1992. The June 1996 Decree establishes an individual’s “unconditional right” to withdraw a land share from a farm enterprise without approval from the management. The decree reiterates the requirement in the 1992 Law “On Dehqan Farms” that all farm members receive “proper documentation” for their land shares, and that a withdrawing worker has the right to an in-kind share in non-land assets.

Land Use Certificates and Land Passports were introduced in June 1998 as the documents that confirm an individual’s right to land use. Both dehqan farmers and operators of household plots have the right to obtain these certificates. Importantly, this decree does not provide for certification of individual land share rights within enterprises. A standard example of a Land Use Certificate was published in July 1998 as part of a government resolution that also announced a schedule for the number of enterprises that must be restructured by region by September 1998, December 1998, and March 1999. This resolution called for the future promulgation of procedures on the issuance and registration of the Land Use Certificates. Two Government Resolutions adopted in February 1999 established simplified procedures for registration of land use rights and for determination and registration of land shares distributed to members of former kolkhozes and sovkhozes. These simplified procedures were intended to cut through red tape in cadastral organs.

The Law “On Land Use Planning” passed in April 2001 laid the foundations for registration and titling by introducing the procedures for surveying, mapping, and demarcation of land plots. This law, however, also retained some very strong elements of state intervention in farm production activities in the guise of land use planning. A new version of this law was passed in January 2008, but it still contains provisions that allow the government to intervene in cropping and production decisions of farms through the tools of “intra-farm” land use planning, severely restricting the property rights of the farmers and contradicting the “freedom to farm” principles.

In April 2002, the new Law “On Dehqan Farms” (replacing the 1992 law) explicitly introduced three types of dehqan farms: individual farms, family farms, and collective dehqan

farms (“partnerships”). This constituted ex-post recognition of the fairly widespread phenomenon of collective (as opposed to individual and family) dehkan farms that emerged over the years in the process of government-induced reorganization of farm enterprises. Despite the new name and the new organization procedure, the collective dehkan farms did not function differently from their collective and state farm predecessors.

The inadequate reorganization failed to improve the efficiency of collective dehkan farms compared with the traditional farm enterprises. The persistent inefficiency coupled with continued government intervention led to accumulation of debt, especially in cotton growing farms. The cotton debt problem was addressed in March 2007 by Government Resolution 111 entitled a “Plan of Measures for Cotton Farm Debt Resolution for 2007-2009”. This resolution included policy measures aimed at creating a better enabling environment for cotton producers (“freedom to farm” measures) and a call to “design procedures for farm debt resolution” by April 2007. Unfortunately, the enabling measures have not been fully enacted to this date (mid-2008) and the “freedom to farm” principles seem to have been abrogated by more recent legislation, such as the January 2008 Law “On Land Use Planning”.

3.2. Changes in farm structure and land tenure since independence

Soviet agriculture in Tajikistan, as in all other former Soviet republics, was characterized by total dominance of large collective and state farms, which controlled 99% of agricultural land and 96% of arable land in the pre-independence era. The dominance of large corporate farms began to wane when serious land reform measures began to be implemented in Tajikistan after 1995.

Figure 3.1 shows how the share of agricultural land in corporate farms – the successors of former collective and state farms – began to shrink, dropping steadily from the Soviet level of 99% to 30% in 2007. Much of this land shifted to new emergent farm structures – the so-called dehkan farms, which now control more than 60% of agricultural land, double what remains in corporate farms (between 1998 and 2007 agricultural land in dehkan farms grew from 300,000 hectares to nearly 2.6 million hectares).

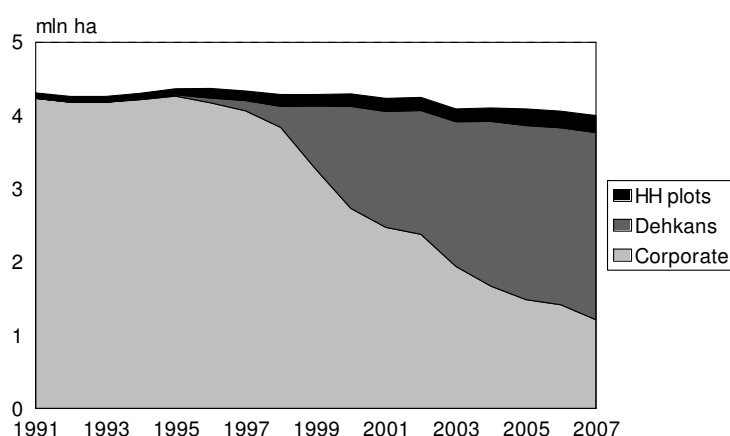


Figure 3.1. Agricultural land by farm type, 1991-2007 (million hectares). Dehkans include both family and collective dehkan farms.

The remaining 6% of agricultural land is in household plots, which have increased their share many-fold from the traditional 1% in the Soviet period. There was a doubling in the land area allotted to private household plots by Presidential Decrees in 1995 and 1997. These decrees increased land area in them from 86,400 hectares in 1993 to 130,400 hectares in 1996 and

further to 170,400 hectares in 2000.⁶ This constituted growth from less than 2% to 4% of total agricultural land in Tajikistan (**Figure 3.2**). Since 2000 land in household plots has continued to grow to 230,900 hectares by the end of 2007. This further increase implies that agricultural land in plots is 5.8% of total agricultural land. As household plots have virtually no pastures, their share in arable land is much higher than in agricultural land, nearly 20% in 2007. **Figure 3.2** illustrates the dramatic growth in the share of land controlled by the household plots, showing the increase in their agricultural land and especially their arable land holdings since 1995.

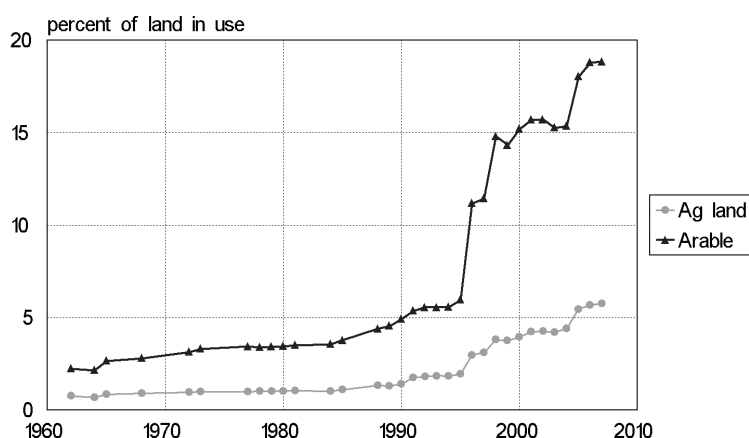


Figure 3.2. Share of household plots in land use, 1962-2007 (in percent).

Table 3.2. Estimates of the share of individual and corporate sector in land based on data of Goskomstat and the State Agency for Surveying, Cartography, and Land Use (2006)

	Agricultural land	Arable land
Total land	4 million ha	800,000 ha
Share in “enterprises” (corporate farms), %	35	20
Share in household plots, %	6	20
Share in dehkan farms, %	59	60
Estimated share in family dehkan farms (2/3 of land in dehkan farms), %	39	40
Estimate for individual sector (household plots and family dehkan farms), %	45	60
Estimate for corporate sector (enterprises and collective dehkan farms), %	55	40

Source: Calculated from information provided by the State Agency for Surveying, Cartography, and Land Use.

While household plots are true individual or family farms continuing from the Soviet period, they account for only a small part of the land in the family farm sector in Tajikistan. Many dehkan farms represented by the dark-gray wedge in **Figure 3.1** are also individual or family farms, but unfortunately not all of them. A large part of dehkan farms are in fact *collective* dehkan farms and despite the “peasant” adjective in their name they are corporate successors of former collective or state farms. To obtain a proper estimate of the importance of the *family* farm sector in Tajikistan, the dehkan farms need to be separated into *collective* dehkan farms and *family/individual* dehkan farms.⁷ Unfortunately no full statistical data exist to enable us to perform this separation. Partial information obtained from Tajikistan’s State Agency for Surveying, Cartography, and Land Use suggests that in 2004-2006 fully two-thirds of land in dehkan farms was actually held in family or individual dehkan farms, as opposed to collective dehkan farms. This land should be counted together with household plots as land in the

⁶ According to *Action Against Hunger* (2003), this so-called “Presidential Land” is usually located far from one’s private plot, since it was taken from the unused land of the collective of state farm.

⁷ By 1 January 2006 dehkan farms numbered 27,040 of which 18,300 were individual or family based and 8,740 were collective dehkan farms.

individual farm sector. It would thus seem that the individual sector in Tajikistan – including household plots and family dehkan farms – controls today more than 45% of agricultural land (and an even higher share of arable land). These estimates are summarized in **Table 3.2**.

4. The economic effects of land reform

The underlying objectives of land reform in all transition countries are to increase the incomes and the well-being of their large rural populations which rely on agriculture for a substantial part of the family budget. In every CIS transition country this has been done through improving farm productivity and encouraging growth in the agricultural sector. Thus, we begin our examination of the effects of land reform with an examination of agricultural growth.

We can distinguish four main effects of land reform in Tajikistan. The first is the recovery of agricultural production that began in 1998 and brought Tajikistan's agriculture back to pre-transition levels by 2007. Land reform was to a great degree responsible for this agricultural growth by expanding the stock of land at the disposal of household plots and dehkan farms. The lion's share of the growth in this recovery is attributable to growth of production in household plots with some growth coming from newly formed dehkan farms.

The second effect of land reform concerns the sources of growth—productivity increases as well as increases in land and livestock. Much of the growth in GAO can be attributed to productivity increases, and the majority of productivity increases has come from household plots. In sum, the main achievement of land reform has been the redistribution of land to household plots that have increased agricultural production primarily through increased productivity.

A third effect of land reform involves important structural changes in agriculture, in cropping patterns and in the sectoral structure of agriculture. Distribution of additional land to household plots and the restructuring of agricultural enterprises have necessarily resulted in a loss of control by the government over the mix of crops produced. As a result, the area sown to cotton has fallen and the area in grain and horticultural crops has increased. In addition, land reform has resulted in the near total transfer of livestock inventories to household plots.

The final effect of land reform in Tajikistan has been an improvement of rural family incomes through the increases in land in household plots and family dehkan farms. In other CIS countries where individual agricultural assets and production have increased there has been a corresponding growth in rural incomes.⁸ We observe similar changes in Tajikistan.

In Chapters 4 and 5 the economic impacts of land reform are examined through the prism of two substantially different datasets. Sections 4.1-4.3 and 5.1 rely on official statistical data from the various yearbooks published by Tajikistan's State Committee of Statistics to construct the changes induced by the reform on the sectoral level. In sections 4.2 and 5.2-5.3 the official statistics are supplemented with information from four farm-level and household-level surveys conducted in the last five years (see *Introduction* for details).

⁸ Lerman, Z. and Sedik, D. (2008), *Rural Transition in Azerbaijan* (Rome: FAO, forthcoming, 2009).

4.1. Recovery of agricultural production in Tajikistan

The recovery of gross agricultural production in Tajikistan began in 1998, and has proceeded at an annual rate of 8% from 1997 to 2007 (**Figure 4.1**). The impressive rate of agricultural growth has allowed production to rise by 113% since 1997, returning to 1991 levels by 2007. This matches the GDP growth during the same period.

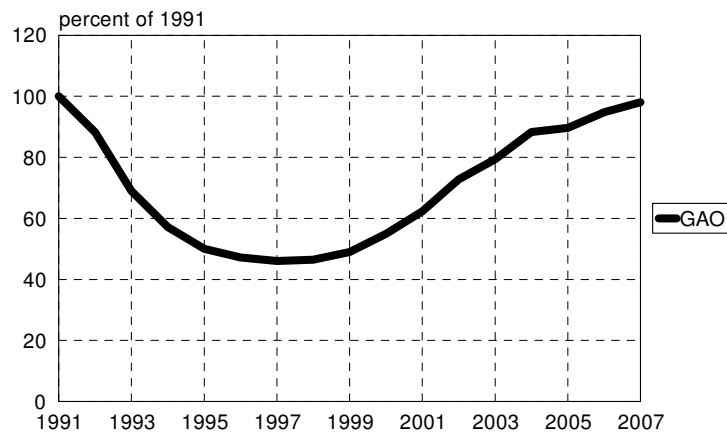


Figure 4.1. Decline and recovery of agricultural production in Tajikistan, 1991-2007 (GAO in percent of 1991; calculated in constant 2003 prices).

Growth in agricultural production has been driven exclusively by household plots and dehkan farms, shown in **Figure 4.2** by the two top gray layers. The corporate sector continued its general decline (the bottom black layer in the diagram).

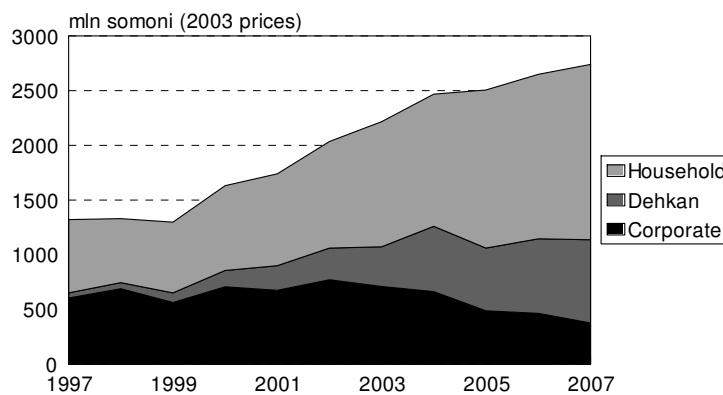


Figure 4.2. Agricultural production by farm type, 1997-2007 (million somoni in constant 2003 prices).

Figure 4.3 breaks down the GAO growth into the two main components of Tajik agriculture: individual farms (household plots and dehkan farms) and corporate farms (the successors of former kolkhozes and sovkhozes).⁹ The output of corporate farms continues to decline since 1991 and so far it has not shown any recovery (gray curve in **Figure 4.3**). The output of individual farms, on the other hand, did not decline even in the early years of transition (1991-1997) and it trebled between 1998 and 2007 (thick black curve in **Figure 4.3**). It is this dramatic increase of production in the individual sector that drove up the aggregate

⁹ Some of the dehkan farms in Tajikistan are so-called “collective dehkan farms”, and they appear to be closer to corporate farms than to individual farms. Unfortunately, there is no breakdown of statistical data between the two types of dehkan farms and they are all reported here as part of the individual farm sector.

agricultural output in Tajikistan and produced the observed recovery (thin black curve in **Figure 4.3**).

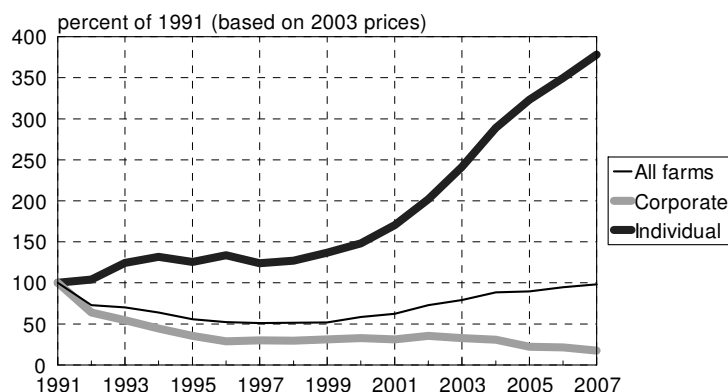


Figure 4.3. Growth of agricultural production by farm type 1991-2007 (GAO in percent of 1991, based on constant 2003 prices).

4.2. Sources of recovery of agricultural production in Tajikistan

The sources of growth in agricultural production are perhaps just as important as the growth itself. The rationale behind agrarian reform has always been the potential productivity gains from the transfer of land and other assets from collective and state farms to individual farms. Therefore, an important indicator of the success of reforms is the presence or absence of productivity increases as a source of recovery.

Land and labor productivity growth

The recovery of agricultural production in Tajikistan has been driven largely by productivity increases. Productivity can be calculated in physical units, as the number of kilograms produced per hectare (for crops) or per cow (for milk). More generally, agricultural productivity is calculated in aggregated value terms as partial productivity of land (aggregated value of agricultural output per hectare of agricultural land) and partial productivity of labor (aggregated value of agricultural output per agricultural worker, including self-employed dehkans).¹⁰ **Figure 4.4** shows the three curves that constitute the basis for value-based productivity calculations: agricultural production (gray curve), agricultural land in use (thin black curve), and agricultural labor (thick black curve). The curves span the period 1980-2007 and they are all normalized to index numbers with 1980=100, thus eliminating problems due to differences in units of measurement.

Agricultural output (GAO) has increased dramatically since 1997, while agricultural land has remained generally constant (and even declined slightly). This essentially means that the partial productivity of land increased, more than doubling (in constant prices) between 1997 and 2007 (**Figure 4.5**). Agricultural labor, unlike agricultural land, increased steadily over time, but its increase lagged behind the growth in agricultural output after 1997 and as a result the productivity of agricultural labor also increased between 1997 and 2007, although more moderately than the productivity of land.

¹⁰ More sophisticated measures rely on total factor productivity (TFP), which aggregates the partial measures into one index that allows for the entire basket of resources and inputs used in agriculture. TFP is technically difficult to calculate, however, as it requires estimation of the production function to obtain the weights for the aggregation of inputs.

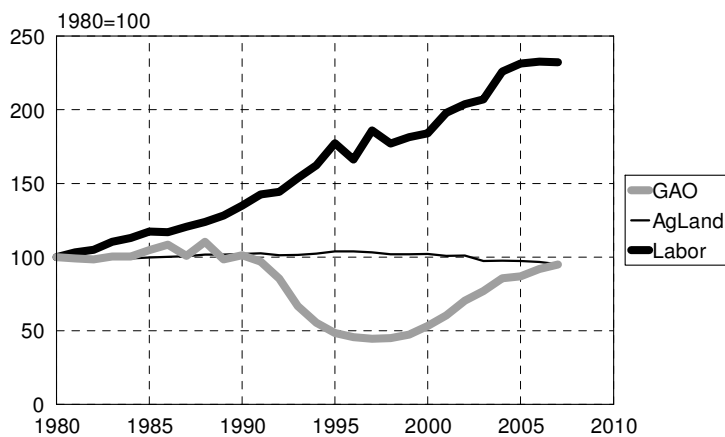


Figure 4.4. Basic data for productivity calculations 1980-2007 (index numbers in percent of 1980).

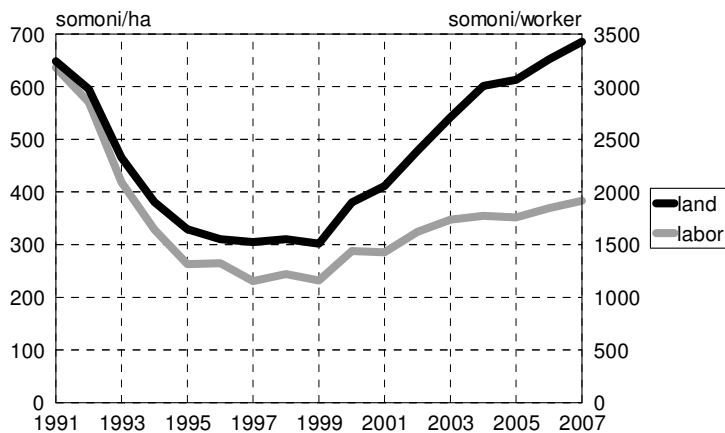


Figure 4.5. Productivity of land and labor, 1991-2007 (GAO per hectare of agricultural land and per agricultural worker, all farms, somoni per ha in constant 2003 prices).

The case for land reform and the potential yield improving effects can be seen in **Figure 4.6** which shows the huge differences in productivity of land between household plots on one side and corporate and dehkan farms on the other. Household plots – the undisputed individual farms in Tajikistan (and other CIS countries) – consistently achieve much higher levels of land productivity: agricultural land in household plots is utilized 20 to 50 times more productively than in farms of other types. Further redistribution of land to household plots could substantially increase average productivity in agriculture, thus leading to a large increase in agricultural production.

Figure 4.6 also illustrates that farms of all three types achieved increases in land productivity since 1999. While growth in agricultural production was driven entirely by the individual sector (see **Figure 4.2**), the growth in land productivity appears to be driven by farms of all organizational forms. At the same time it is noteworthy that dehkan farms are not doing better than farm enterprises on average. This puzzling result may stem from the fact that at least one-third of the dehkan farms are not individual farms at all (see **Table 3.2**): they are collective farms (partnerships) created in the process of reorganization of traditional farm enterprises and their incentives are closer to those of corporate farms than individual farms. A November 2003 FAO mission found that "... many of these [collective dehkan] farms were only cosmetically reorganized and most of the members do not have sub-certificates or even know they have a right to a portion of the land. The management structures have remained the same in many of the farms as well."¹¹ Under these circumstances we should not be surprised

¹¹ Inception Mission Report OSRO/TAJ/402/CAN, 25 June 2004.

that the productivity of dehkan farms taken as a heterogeneous group is not different from that of the farm enterprises they succeeded. Future analytical efforts should attempt to separate the performance of individual dehkan farms from collective dehkan farms.

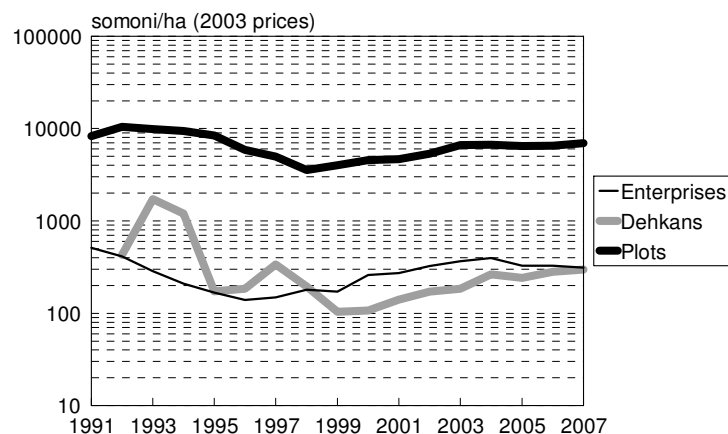


Figure 4.6. Productivity of land by farm type, 1991-2007 (GAO per hectare of agricultural land, by type of farm, somoni per ha in constant 2003 prices, log scale).

Productivity and recovery by farm type

The aggregate curves of **Figures 4.4** and **4.5** illustrate that productivity change has played a role in the recovery of agricultural production in Tajikistan. However, they leave the question of how large a role and in what type of farms unanswered. In the following section the sources of recovery of crop and livestock GAO are analyzed by farm type. Such an analysis allows us to understand the role that productivity change has played in the recovery by farm type.

This type of comparison shows that the recovery of crop production in Tajikistan was driven by productivity increases in household plots (intensive growth) and increases in sown land in dehkan farms (extensive growth). The recovery in livestock production was driven partly by productivity increases and partly by increases in inventories of animals in household plots. Dehkan farms and agricultural enterprises contributed very little to the recovery of livestock production largely because they produce only 6% of livestock output between the two of them.

Growth in crop and livestock production 1997-2006

Before analyzing the sources of recovery it is important to consider the record of crop and livestock production in Tajikistan during the period of agricultural recovery from 1997 to 2006. Since 1997 the value of crop production in Tajikistan has grown by 102% in constant prices, at a rate of 8% per year (**Figure 4.7**). By the end of 2006 crop production levels were already 30% above their levels in 1991. By 2006 household plots were producing 50% of aggregate crop output, compared with 36% in dehkan farms and 14% in agricultural enterprises.

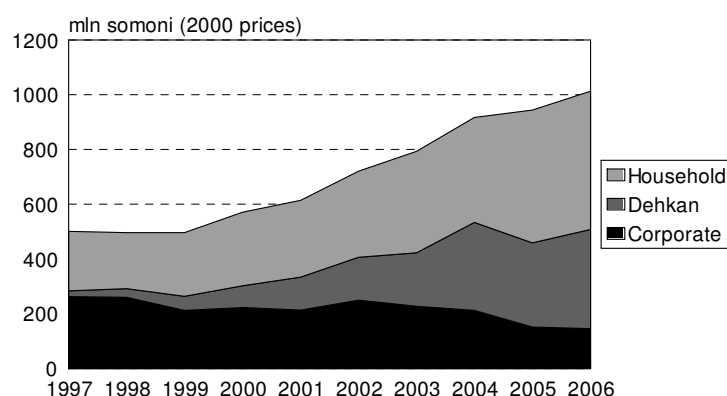


Figure 4.7. Aggregate value of crop production by sector, 1997-2006.

The aggregate value of livestock production in Tajikistan grew by 137% between 1997 and 2006, at a rate of 10% per year (**Figure 4.8**). The high growth rate of livestock production has meant that the portion of livestock production in total GAO in Tajikistan has increased from 12% in 1997 to 25% in 2006. Despite this rapid growth, by the end of 2006 livestock production levels were only 45% percent of the level of 1991. By 2006 household plots produced 94% of aggregate livestock output, while dehkan farms and agricultural enterprises produced only 3% each.

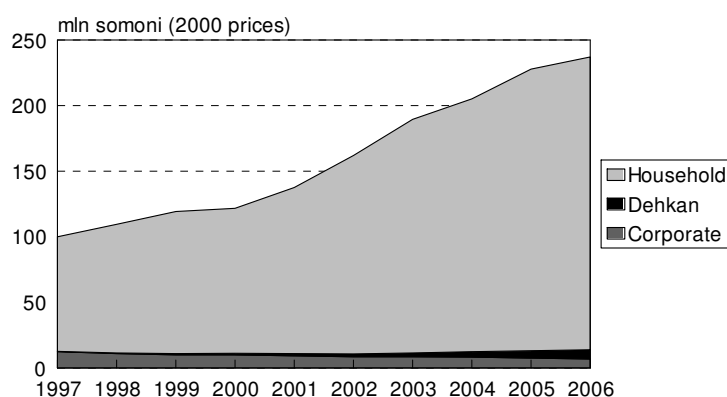


Figure 4.8. Aggregate value of livestock production by farm type, 1997-2006

Crop and livestock productivity 1997-2006

Table 4.1 gives an indication of the importance of productivity differences for crop and livestock GAO in 2006. While household plots contribute 50% of aggregate crop production, they hold only 20% of sown area. Agricultural enterprises and dehkan farms between them produce the other 50% of crop output, but control 80% of sown area. Higher land productivity in household plots explains how they can produce the same output with far less land at their disposal (see **Figure 4.6**). Household plots also achieve higher livestock productivity levels (i.e., aggregate value of livestock production in constant prices per

standard head) than dehkan farms and agricultural enterprises. Thus household plots hold 87% of livestock inventories, but produce 94% of livestock output (**Table 4.1**). The other 13% of inventories are held in dehkan farms and agricultural enterprises, which produce only 6% of livestock output.

Table 4.1. Crop and livestock production in 2006: structure of resource base and aggregate value by farm type, 2006 (%)

Variable	Sown area	Crop production	Livestock inventories	Livestock production
Total	100	100	100	100
Household plots	21	50	87	94
Dehkan farms	49	36	6	3
Agricultural enterprises	30	14	7	3

We now focus more closely on the issue of land and livestock productivity by farm type for the recovery period from 1997 to 2006. In **Figures 4.9** and **4.10** productivity is calculated by taking the aggregate value of crop and livestock production (in constant prices) per hectare of sown land and per standard head of livestock inventories, respectively. We distinguish two important issues: productivity growth and the level of productivity. Productivity growth rates for farms of different types can be compared by focusing on the slopes of the curves. Productivity levels can be compared by considering the relative levels of the productivity curves along the vertical axis (denominated in somoni per unit hectare or per standard head).

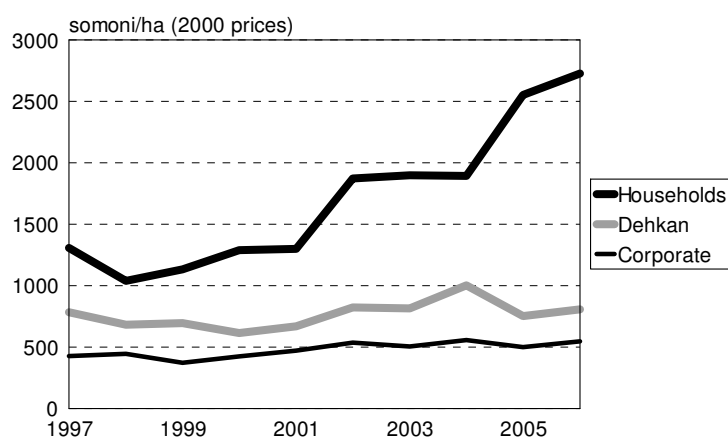


Figure 4.9. Changes in land productivity, 1997-2006.

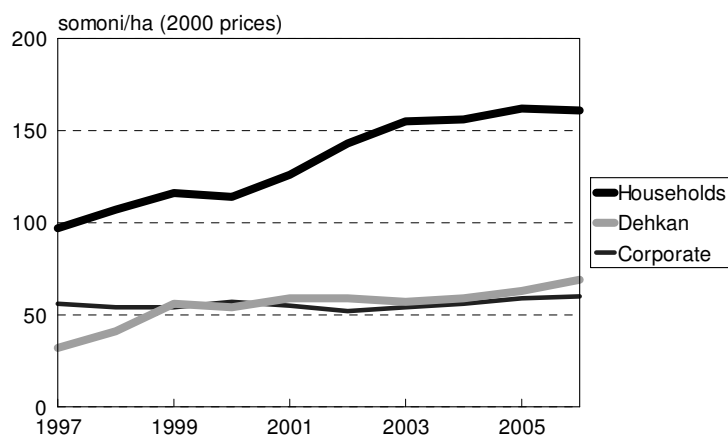


Figure 4.10. Livestock productivity 1997-2006.

Household plots show fast growth in productivity of both crops and livestock. Moreover, their productivity levels are high above those achieved by dehkan farms and agricultural enterprises over the entire period 1997-2006 (Figures 4.9 and 4.10). The virtual absence of productivity growth and its low level in agricultural enterprises are an indicator of how little these farms have changed from their predecessors, collective and state farms. Although dehkan farms show growth in livestock productivity (Figure 4.10), they remain only slightly more efficient than agricultural enterprises in both the crop and the livestock sector. In other words, there has been very little improvement compared with productivity levels in agricultural enterprises, presumably because of inadequate restructuring among collective dehkan farms.

Despite recent increases in livestock productivity in farms of all types (Figure 4.10), there is a generally low level of livestock productivity in Tajikistan. Milk yields are representative of the problem. Milk yields in Tajikistan fell dramatically between 1985 and 1997. They then recovered no less dramatically and have remained fairly constant since 2002 (Figure 4.11, gray curve). The recovery in milk yields is not directly linked to any improvements in animal nutrition, as the availability of feed crops per cow was declining both before and after 1997 (Figure 4.11, black curve). Despite recent improvement, however, milk yields in Tajikistan remain extremely low. At less than 800 kg per cow per year, they are far below the yields in Western countries and rock bottom in the CIS (Figure 4.12).

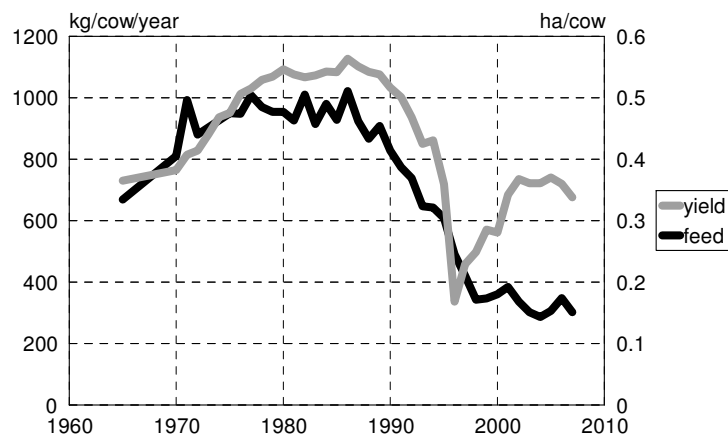


Figure 4.11. Milk yields (kg/cow/year) and availability of feed crops per cow (ha in feed crops/cow) 1965-2007.

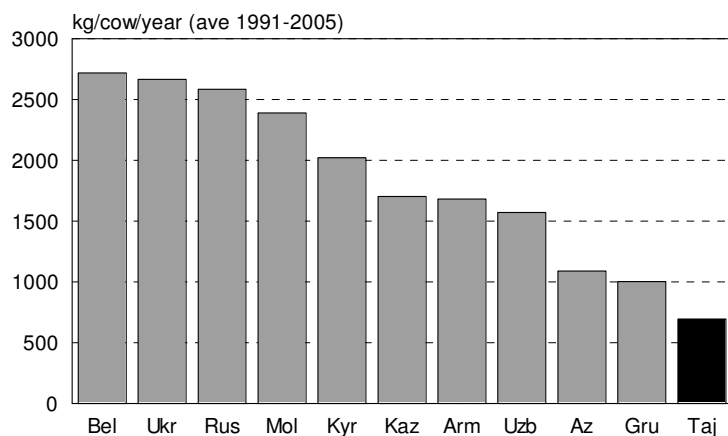


Figure 4.12. Milk yields for Tajikistan and other CIS countries (averages for 1991-2005).

Sources of crop and livestock growth 1997-2006

In this section we analyze the sources of growth of crop and livestock GAO. **Table 4.2** identifies the portion of growth of crop and livestock GAO attributable to resources. Growth in agricultural output can originate from increases in the resources utilized (so-called extensive growth) or from increases in the efficiency with which resources are employed (intensive growth). For example, the value of crop production can increase as a result of increases in sown area, increases in the productivity with which farms utilize land, or a combination of these two factors. Likewise, growth in the value of livestock production can derive from increases in livestock inventories, increases in the productivity with which farms make use of livestock (e.g., milk yields achieved by dairy farmers), or a combination of the two. The complement of the resource component given in **Table 4.2** is the contribution from increases in productivity, calculated as one-hundred minus the resource component. The decomposition is carried for the three farm types under consideration.

In considering **Table 4.2** it is important to recall that crop production made up three-quarters of total GAO in 2006, while livestock made up only one-quarter. Thus, the importance of crop production performance is three times as important for total GAO growth as that of livestock production. The decomposition in **Table 4.2** shows that 55% of growth in crop production in Tajikistan is attributable to increases in land area, while the remaining 45% can be attributed to increases in productivity. However, there are large differences in the contribution of productivity growth by farm type. Production growth in dehkan farms was due nearly exclusively to increases in area, extensive growth *par excellence*. For corporate farms 80% of changes in production were due to changes in sown area, and only 20% was due to productivity changes. While sown area in corporate farms fell by 60% in this period, crop production fell by only 40%, implying that land productivity in corporate farms actually increased by 30%.

The performance of household plots stands apart from the two other farm types for its preeminent reliance on productivity change for growth of crop production. Over one half (52%) of growth in crop production in household plots can be attributed to productivity increases.

Table 4.2. Changes in output and resources by farm type, 1997-2006 (2006/1997, times)

	Tajikistan	Corporate farms	Dehkan farms	Household plots
Crop production				
Aggregate value	2.0	0.6	17.2	2.3
Sown area	1.1	0.4	16.7	1.1
Implied productivity change	1.8	1.3	1.0	2.1
Contribution of change in resources to change in production (%)	55	78	97	48
Percent of aggregate crop production in 2006 (%)	100	14	36	50
Livestock production				
Aggregate value	2.4	0.6	25.9	2.5
Animal head count	1.4	0.5	11.7	1.5
Implied productivity change	1.7	1.2	2.2	1.7
Contribution of change in resources to change in production (%)	57	83	44	58
Percent of aggregate livestock production in 2006 (%)	100	3	3	94

The decomposition of livestock production growth in Tajikistan shows that 57% of growth can be attributed to increases in livestock inventories and 43% of growth can be attributed to increases in productivity. Once again there are substantial differences in the contribution of productivity growth by farm type. However, the contributions to overall production growth from enterprises and dehkan farms are exceedingly small, because together they account for only 6 percent of total livestock production. Growth in the household plot sector that dominates livestock production in Tajikistan was due 42% to increases in productivity and 58% to increases in livestock inventories.

Table 4.2 confirms that the majority of productivity change contributing to GAO growth has come from household plots rather than from the other two farm types. On the whole, household plots have performed quite a bit better than enterprises and dehkan farms. Fifty percent of the increases in crop production and 40% of the increases in livestock production in household plots can be attributed to increases in productivity (of land and animals, respectively). The productivity performance of agricultural enterprises in Tajikistan has been quite low for both crop and livestock production. In both sectors 80% of production changes in enterprises are due to changes in resources and only 20% to productivity changes. Dehkan farms perform no better, even worse, in crop production in which nearly 100% of changes in production stem from changes in sown land. In the livestock sector dehkan farms perform better with 66% of production increases attributable to productivity increases. However, this makes only a negligible difference for the livestock sector, since dehkan farms produce only 3% of livestock production in Tajikistan.

4.3. Structural changes in Tajik agriculture

The reforms implemented since 1990, and especially after 1998, have affected not only the structure of land tenure, but also the cropping patterns, the distribution of livestock by farm type, and the distribution of GAO between livestock and crop production.

Changes in cropping patterns

The restructuring or dissolution of collective and state farms and the establishment of individual farms necessarily entails the loss of a degree of control by the government over crop production and the mix of crops. This loss is best exemplified in changes in cropping structure. The main changes in Tajikistan as a result of land reform have been an increase in the area devoted to grains, decreases in the area of cotton and feed and an increase in the area devoted to horticultural crops.

Table 4.3. Cropping structure 1980-2007

	Total sown, '000 ha	Grains, %	Cotton, %	Horticultural crops, %	Feed crops, %
1980	763.6	25.5	40.4	4.3	28.5
1985	802.8	26.1	38.8	4.7	29.2
1990	824.2	27.9	36.8	5.9	28.0
1995	758.0	35.0	35.4	6.1	21.3
1998	827.6	49.2	29.4	6.7	10.8
2000	864.3	48.8	27.6	7.7	11.5
2003	886.9	45.6	32.1	7.6	10.8
2006	900.2	44.6	29.2	8.1	14.6
2007	891.1	44.5	28.6	9.0	14.6

Sown area in Tajikistan is heavily weighted toward cotton and wheat production. Together, these two crops occupy 73% of sown land in Tajikistan (2007; see **Table 4.3**). Cotton alone occupies 30% of sown land. Like other countries in Central Asia and Azerbaijan, Tajikistan has seen a partial switch from cotton to grain production since the late 1980s. Between 1986 and 2007 the portion of sown area in cotton in Tajikistan declined from 40% to less than 30%.

During the war (1993-1997) the area in cotton, and especially the area in feed crops, was reduced to make way for increased production of grains (primarily wheat) and other food crops (horticulture). Between 2000 and 2004 we again witnessed expansion of cotton area, while grain areas remained unchanged (**Figure 4.13**): this was made possible by an overall increase in cultivated area – see **Table 4.3**). The expansion of cotton apparently ended in 2005, when sown area in cotton resumed its fall.

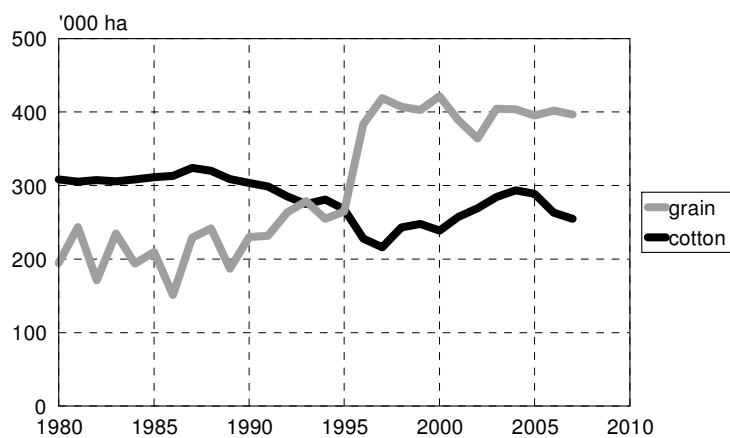


Figure 4.13. Areas sown to cotton (black curve) and cereals (gray curve), 1980-2007 ('000 hectares).

The loss of 12% in cotton area was partly responsible for the fall in cotton production of nearly half from 1991 to 2007. However, the more fundamental reason behind this fall has been a fall in cotton yields of 39%. **Figure 4.14** presents a long-term view of the cotton and grain yields since 1980. We clearly see how cotton yields tumbled from about 3 ton/ha in the 1980s to less than 2 ton/ha in recent years. There were signs of recovery in cotton yields after 1999, when they rose from 1.5 ton/ha to nearly 2 ton/ha, but the performance in 2005-2007 was again disappointing and it now remains to see if in the future cotton yields will rise to the relatively high level of 2 ton/ha or will stick at the low level of 1.5 ton/ha. Grain yields, on the other hand, recovered robustly after 1995 and today, at 2 ton/ha, they are significantly higher than during the Soviet period.

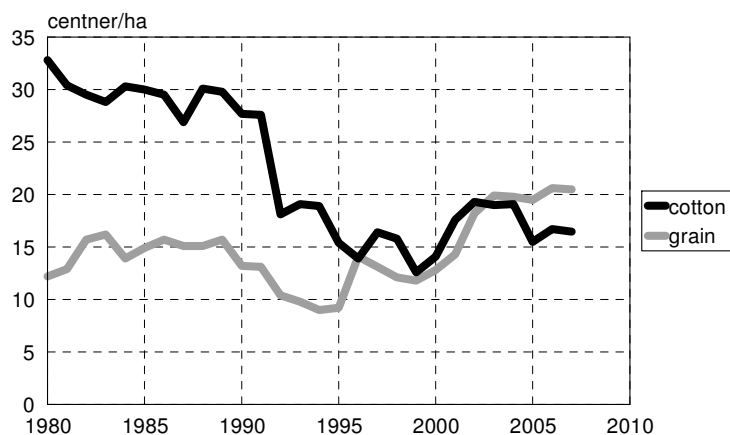


Figure 4.14. Cotton and grain yields, 1980-2007 (centner/ha). Horticultural crops (potatoes,

vegetables and melons) are typically grown in household plots – for both family consumption and sales – and their total area is quite small (this is true for all CIS countries). Nevertheless, the cotton–grain area tradeoff in Tajikistan has been accompanied by a definite increase in the area sown to horticultural crops, which boosted its share from 4%-5% of sown area in the 1980s to 8% in the 2000s. In absolute numbers the increase was even more impressive, as the area under horticultural crops expanded from 33,000 hectares in 1980 to 80,000 hectares in 2007. A careful focus on this change shows that it is probably a result of an increase in the area in household plots (**Figure 4.15**). The high positive correlation between area in horticultural crops and agricultural land in household plots (correlation coefficient 0.9 during 1980-2007) is explained by the fact that the small household plots usually specialize in production of high value added horticultural crops and livestock products, forgoing scale crops (cotton and wheat).

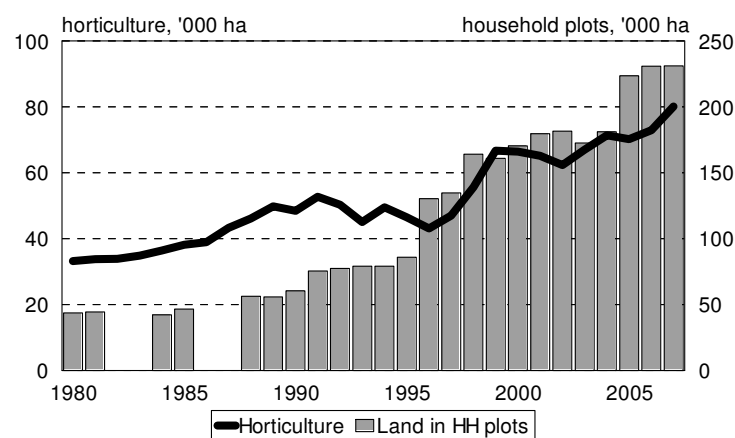


Figure 4.15. Area in horticultural crops and agricultural land in household plots 1980-2007 ('000 hectares).

The importance of horticultural crops for rural households is clearly seen from **Table 4.4**, which presents the cropping structure for farms of each type separately (averages for 2001-2007). Thus, horticultural crops account for 3% in farm enterprises, 5% in dehqan farms, and fully 23% of sown area in household plots. Households also devote more than two-thirds of their small area to cereals, mainly for feeding livestock: this efficiently compensates for their inability to grow enough feed crops on the tiny area of land in their disposal. On the other hand, household plots grow no cotton and very little other technical crops (flax, tobacco, etc.).

Table 4.4. Cropping structure for farms of different types (averages for 2001-2007)

	Total sown, '000 ha	Grains, %	Technical crops, %	Horticultural crops, %	Feed crops, %
All farms	880	44.8	34.8	7.9	12.5
Enterprises	363	34.0	46.4	3.0	16.6
Dehqan farms	324	42.7	40.0	5.1	12.2
Household plots	193	68.4	4.0	22.6	5.0

Tajikistan has a great deal of potential as a producer of horticultural crops. **Table 4.5** shows that other countries undergoing vigorous individualization of agriculture, such as Azerbaijan and Kyrgyzstan, have expanded the area under horticultural crops quite rapidly with land reform. In Tajikistan the expansion of horticulture as a reliable source of food was triggered by the war years, and the trend has continued after hostilities ceased. It is relevant to consider which types of horticultural crops are suitable for cultivation in the traditional cotton-growing areas of Tajikistan (Ferghana Valley in Sogd, Gissar Valley around Dushanbe and further

east, Kofarnihon, Vakhsh, and Yakhsu–Panj valleys in Khatlon – see **Map 2.3**), and what policy changes could enable an increase in area cultivated for horticultural crops.

Table 4.5. Horticultural crops as percent of total sown area in selected countries

	Azerbaijan	Kyrgyzstan	Tajikistan	Uzbekistan
1980	5.4	3.4	4.3	4.5
1985	5.0	3.4	4.7	4.6
1990	5.0	4.1	5.9	6.2
1995	4.0	6.7	6.1	5.8
1998	8.3	8.7	6.7	5.7
2000	13.0	9.9	7.6	5.8
2003	13.5	11.3	7.5	6.2
2005	13.5	10.8	7.8	6.1

Source: CIS Statistical Committee (2006).

Concentration of livestock in the household sector

Land reform has resulted in a larger portion of land in household plots and family dehkan farms. It has also resulted in the near total transfer of livestock inventories to household plots. The individual sector controlled most of the livestock even back in the Soviet era, when more than 60% of the herd (in standard head) was in household plots (**Figure 4.16**). In 1990, 62% of livestock was held outside of corporate farms. By 2007 the share of household plots in livestock had risen to 90% (measured in standard head). Moreover, **Figure 2.14** clearly demonstrates that the increase in livestock head count since 1995 is entirely attributable to the increase in individual sector (household plots and dehkan farms combined), which has more than offset the shrinkage of livestock in corporate farms (enterprises). It is the household component of the individual sector that continues to dominate livestock production, while dehkan farms remain but a minor player in livestock production. This situation is not unique to Tajikistan: a similarly extreme concentration of livestock production in household plots is also observed in Uzbekistan.

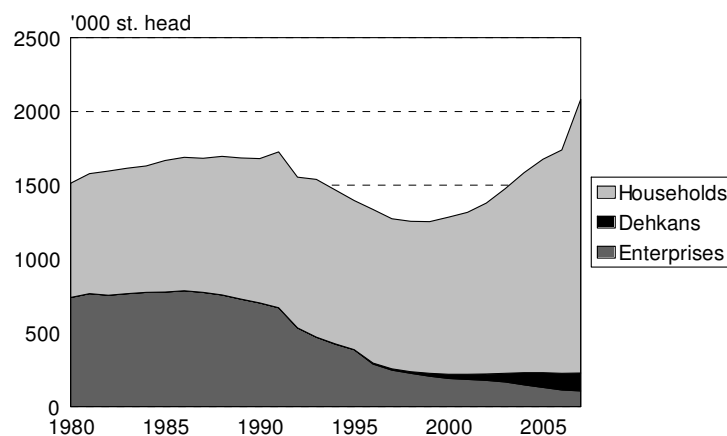


Figure 4.16. Livestock inventories by farm type, 1980-2007 ('000 standard head).

The dramatic increase in the portion of livestock inventories in household plots has not altered the sectoral structure of Tajik agriculture. It continued to be heavily biased toward crop production. Crops accounted for around 70% of GAO during most of the years from 1960 to 1990, and then rose sharply to 80%-85% of GAO between 1995 and 1999 as the decline in animal numbers (see **Figure 4.16**) adversely affected the volume of livestock production. With the recovery of livestock numbers, the share of crop production edged down to 75% of

GAO after 2000 and is now approaching again the pre-transition level of 70%. In the long term, the share of livestock production in Tajikistan’s GAO is substantially lower than in other Central Asian countries (not to mention the European CIS countries, see **Table 4.6**). Thus, agricultural production in Kazakhstan and Kyrgyzstan is generally biased toward livestock, and crops on average have accounted for less than 50% of GAO since 1980. Even Uzbekistan, with its agriculture heavily dependent on cotton like that in Tajikistan, maintains livestock production levels in excess of 40%-45% of GAO. Tajikistan appears to be an outlier because of its low livestock production.

Table 4.6. Sectoral structure of agricultural production in selected CIS countries: average livestock shares for 1980-1989 and 1992-2005 (percent)

	1980-1989	1992-2005	Direction of change since independence
<i>Low-livestock countries</i>			
Tajikistan	32	24	Down
Turkmenistan	34	36	No change, but unreliable data after 1992
Azerbaijan	32	40	Up
Uzbekistan	33	47	Up
<i>High-livestock countries</i>			
Kazakhstan	59	44	Down
Kyrgyzstan	57	50	Down
Ukraine	54	42	Down
Russia	61	48	Down

Source: CIS (2006).

Table 4.6 shows a clear convergence since 1992 between “high-livestock” countries (such as Kazakhstan, Kyrgyzstan, Russia, Ukraine) and “low-livestock” countries (Azerbaijan, Uzbekistan). After independence the share of livestock in agricultural output moved down in “high-livestock” countries and up in most “low-livestock” countries. As a result, the differences between the two groups of countries, which had been quite pronounced during the Soviet period (1980-1989), virtually disappeared by 2005. Tajikistan is the only one among the “low-livestock” countries where the share of livestock in GAO moved even further down after 1992. These trends would seem to indicate that there is ample potential for the expansion of the Tajik livestock sector given an adequate policy environment with less administrative intervention in crop production.

4.4. Land reform and family wellbeing

The ultimate goal of land reform is to improve the incomes and the wellbeing of rural families. Land has been shown in other CIS transition countries to be an important correlate of higher rural family incomes in individual farms. In Tajikistan survey data on land and family income (or well being) also show a positive correlation. Thus, it is reasonable to assume that increases in land holdings in individual farms as a result of land reform in Tajikistan have led to an increase in family incomes.

The link between land and family income relies on cross-section survey evidence showing that larger individual farms tend to have higher family incomes and higher well-being. This cross-section evidence suggests that it is quite likely that the one-off distribution of land to household plots and to family dehkan farms raised family incomes in rural areas. In this section we first examine the impact of land holdings on family income and well-being, and then proceed to analyze the role of the land market as represented by leasing transactions.

Land holdings and well-being

Already the **2003 Tajikistan LSMS** provided cross-section survey evidence that in rural households both income and income per capita increased with land holdings (**Figure 4.17**).

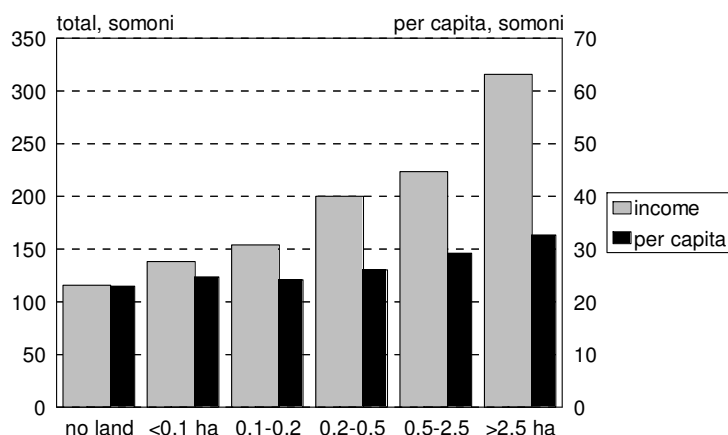


Figure 4.17. Family income and per capita income vs. land holdings (somoni). Source: TajLSMS 2003 (2,588 rural respondents).

Family wellbeing can be assessed by objective measures and by subjective perceptions. Objective measures include the absolute income in monetary terms (including the value of consumption of own products) and various physical endowments, such as land, livestock, household possessions. Unfortunately, none of the surveys used in this study (except the 2003 Tajikistan LSMS study) not contain sufficiently complete information on family incomes (although they do contain information on endowments). Subjective perceptions are represented by different questions in different surveys: the **FAO 2007-2008** survey asked respondents to assess their level of wellbeing on a three-point scale (low, medium, or comfortable); the **2007 USAID/WB** survey included qualitative assessment of the family income relative to the average income in the village and also assessment of the change in the family's financial situation during the last year.

Land and perceived wellbeing are also positively associated. For household plots, more land implies a higher level of wellbeing (**Table 4.7**). There is a similar general relationship between land and wellbeing for family dehkan farms, but it is not statistically significant due to the smallness of the sample. There is no relationship between the size of the livestock herd and the perception of wellbeing in the **FAO 2007-2008** survey. If anything, households and dehkan farms with more cattle seem to be characterized by a low level of wellbeing.

Table 4.7. Land and wellbeing*

Level of wellbeing	Household plots (n=352)	Family dehkan farms (n=117)
Low	0.52 ha	8.2
Medium	1.00 ha	9.9
Comfortable	2.32 ha	9.8
	Signif. Anova, Wilcox	No signif. Differences

*Effective number of observations reduced by data cleaning.

Source: FAO 2008.

The **2007 USAID/WB** survey supplements these results by providing data for both family dehkan farms and collective dehkan farms. There is a clear relationship between the subjective perception of family income and the cultivated area in farms of both types (**Table 4.8**). The main conclusion is that among families that cultivate land (in farms of both types

combined) 20% feel that their income is below the village average, compared with only 6% among families with cultivated land. Correspondingly, 40% of families cultivating land feel that their income is higher than the village average, compared with only 23% for families without cultivated land.

On a quantitative scale, families with income above the village average cultivate more land than families with income below the average. There is also a positive association between the number of livestock and the perception of family income: families with income higher than the average have more livestock than families with income lower than the average (**Table 4.8**).

Table 4.8. Land and relative family income

	Income higher than average	Income equal to average	Income below average
Cultivate land*			
Yes	39	55	6
No	23	57	20
Mean cultivated area, ha**	12	10	9
Mean number of animals, st. head^	3.3	2.5	1.6

*Differences between “yes” and “no” statistically significant by chi-square test.

**Differences in land area across income categories statistically significant by nonparametric Wilcoxon test.

^Differences in number of animals across income categories statistically significant by t-test.

Source: 2007 USAID/WB.

Regression analysis of the **2003 Tajikistan LSMS** data show that land reform has probably had a positive impact on family income through making more land available to rural households. The results of a multivariate regression analysis modeling family consumption expenditure (as a standard proxy for family income) on a list of human capitals and physical capitals shows that family expenditure (in somoni) increases with the increase of land holdings and family size (**Table 4.9**). This implies that, for a given family size, more land leads to more income. Land leasing also has a positive effect on income in this regression model: families leasing land have higher incomes than the rest (controlling for the other variables). Additional human capital variables indicate that consumption expenditure increases with years of schooling and age of the household head: education and experience have a positive impact on family income. A new physical capital variable – households without any machinery – show that access to farm machines has a positive impact on consumption expenditure. These effects are statistically significant at the 0.1 level; no significant differences are observed in total expenditure between rural and urban households in the survey.

Table 4.9. Determinants of household consumption expenditure*

Dependent variable: Total consumption expenditure	Coefficient	t-value
<i>Human capital:</i>		
Family size	0.4832	19.35
Age of household head	0.2386	6.02
Years of schooling of household head	0.2212	6.75
<i>Physical capital:</i>		
Plot size, sotki	0.0469	3.61
Household does not lease in land (relative to households leasing land)	-0.0789	-2.17
Household without any machinery (relative to households with machinery)	-0.1706	-3.61
Intercept	3.6776	17.96
Number of observations	2146	
R-square	0.346	

*Logged continuous variables, rural families only. Source: TajLSMS 2003.

We saw earlier in this chapter that land reform is largely responsible for the recovery of agricultural production and that the main driving force behind the recovery is productivity growth in household plots and dehkan farms. The cumulative evidence from the various cross-section surveys cited in this section indicates that land holding is positively correlated with various measures of family and/or per capita well-being. The more land held by families, the higher is the measure of welfare. This survey level evidence suggests that distributive land reform directly contributes to increasing incomes or well-being in rural families.

Land leasing, farm size, and family income

Given the positive effect of farm size on family income or wellbeing, it is important to look at mechanisms that allow adjustment of farm sizes. Normally farmers increase their land holdings through market mechanisms, which in all countries include not only buying and selling of land, but also land leasing. The **FAO 2007-2008 survey** shows that farms that lease land command on average a larger area than farms that do not lease land.

Table 4.10. Effect of leasing on farm size

	HH plots		Family dehkan farms	
	N	Mean farm size, ha	N	Mean farm size, ha
All farms	356	1.67	134	22.3
Leasing based on sources of land:				
Without leasing	299	0.65*	130	18.5
With leasing	57	7.00*	4	144.1
Leasing based on lease payments:				
Without leasing	216	0.65**	103	20.5
With leasing	140	3.23**	31	28.4

*Differences significant by both parametric and non-parametric tests (t-test and Wilcoxon).

**Differences significant only by the parametric t-test.

Source: FAO 2008.

To demonstrate the direct impact of land leasing on farm size in Tajikistan, we dichotomized the farms in the **FAO 2007-2008 survey** into those with leased land and those without leased land. The analysis was carried out separately for household plots and for family dehkan farms using two indicators of leasing for classification: one indicator explicitly took into consideration the responses on area leased from various sources (the state, the local farm enterprise, and private individuals); the other indicator relied on the presence of lease payments. Although the two classifications widely differed in the number of responses in lease/no lease categories (see **Table 4.10**), the mean areas are quite consistent. In all cases farms that lease land command on average a larger area than farms that do not lease land. The differences are statistically significant for household plots, but not for family dehkan farms (where the sample is much smaller). Even the apparently huge difference between 18.5 ha for dehkan farms without leased land and 144.1 ha for dehkan farms with leased land (based on land sources) is not statistically significant, because the category of farms with leased land includes only 4 respondents. Still, the results for household plots show with sufficient confidence that leasing is indeed used as a mechanism for farm size adjustment (similarly to the situation in other CIS countries).

These results are consistent with the findings of the **2003 Tajikistan LSMS**, which provides more reliable estimates as fully 18% of respondents (434 out of 2380) report leasing land. In this earlier survey, land leasing increases the average plot size from 0.20 hectares to nearly 1 hectare (**Table 4.11**).

Table 4.11. Average land holdings for rural households with and without leased land*

	All sample	Ha	No leasing	Ha	With leasing	Ha
“Own” land	2323	0.19	1946	0.20	377	0.16
Leased land	434	0.13	0	0	434	0.74
Total used	2380	0.32	1946	0.20	434	0.90

*Excluding respondents with zero land (10% of the rural sample).

Source: TajLSMS 2003.

Sources of land

Sources of land can be validly estimated in the **FAO 2007-2008 survey** only for a small subsample – 177 out of 356 household plots and 69 out of 135 family dehkan farms. According to survey data, land in **household farms** are primarily leased from farm enterprises, held in use right from the state and leased from other individuals. **Family dehkan farms** tend to hold land in possession or use right from the state.

Among **household plots**, almost two-thirds of the land is leased from the farm enterprise (which includes collective dehkan farms) and interestingly 12% is reported as leased in the form of land shares from other individuals (**Table 4.12**). The rest is in use rights (or possession) or the state. **Family dehkan farms** basically rely on use rights (and possession) from the state: 68 of the 69 respondents do not report any other sources of land. One single family farmer reporting huge holdings (568 hectares; other reported data in the survey are consistent with this number) leases everything in the form of physical plots from individuals. The holdings of this large farmer are divided into 10 parcels and the distance to the most remote parcel is 15 km. The next smaller farm reports 264 hectares split into 12 parcels (6 km to the most remote parcel), but unfortunately no information on sources of land is given (**Table 4.12**).

Table 4.12. Sources of land

	HH plot (n=177)	HH plots up to 50 ha (n=174)	Family DF (n=69)	Family DF up to 100 ha (n=65)
Total land, mean	2.7 ha	0.8 ha	25.8 ha	11.9 ha
Median	0.2 ha	0.2 ha	8.6 ha	7.7 ha
Range	0.03-160 ha	0.03-20 ha	0.84-568 ha	0.84-68 ha
All sources (mean)	100%	100%	100%	100%
Possession from state	7.8	24.0	32.2	40.4
Use rights from state	12.5	38.5	34.3	57.9
Lease from state, municipality	3.3	10.0	0	0
Lease from enterprise	63.6	23.8	0	
Lease plots from individuals	0.5	1.5	32.8 (1 case only!!!)	0
Lease land shares from individuals	11.7	0.4	0.1	0.2
Other	0.6	1.8	0.6	1.5

Source: FAO 2008.

Leasing and family income

Since leasing markedly increases the land holdings, we hypothesize on the basis of the previous results that households that lease in land should report higher income than

households that do not lease land. This hypothesis is confirmed by the regression results in **Table 4.9**, where households that do not lease land have a statistically significant *negative* coefficient (i.e., family expenditure lower than for families that lease land, controlling for all other variables). An easily visualized confirmation of this hypothesis is provided by the survey data presented in **Table 4.13**: both total income and income per capita are higher in households with leased land than in households without leased land (but only the difference in total income is statistically significant). In both cases the data are from the 2003 Tajikistan LSMS, as the only source with consistent income and expenditure information, and they apply to household plots, not dehkan farms.

Table 4.13. Income for rural households with and without leased land (somoni)

	All sample	No leasing (n=2202)	With leasing (n=436)
Total income	168	159	212
Income per capita	25	25	27

Note: The difference in total income between the two categories of households is statistically significant at $p=0.01$. The increase in per capita income from 23 somoni to 33 somoni across the six land size categories is not statistically significant.

Source: TajLSMS 2003.

The results of this section cumulatively point to a positive impact of land reform on household incomes. The impact is associated with two facets of land reform: increase of family holdings through distribution or allocation of land to rural households and emergence of options for land market transactions as reflected in the incidence of land leasing among rural respondents. Both factors – more land and options for land leasing – are seen to raise family incomes (and to a certain extent also per capita incomes).

5. The limitations of land reform and their effects

For all its achievements—the recovery of agricultural production, the increase in land and livestock productivity, the structural changes in crops and livestock and the positive effects of additional land on family incomes—the Tajik land reform still has a number of key limitations that restrict its beneficial effects. These limitations of land reform have been at the center of concern of the government and donors for a number of years now, because many believe that land reform has not lived up to its potential in Tajikistan.

The first major limitation of land reform in Tajikistan is that it is incomplete. There is still a large portion of agricultural land occupied by unreformed farms. Thirty five percent of agricultural land still remains in agricultural enterprises and an additional twenty percent remains in collective dehkan farms, according to the State Agency for Surveying, Cartography, and Land Use. We saw one of the consequences of this limitation in the last chapter. Agricultural enterprises and dehkan farms have far lower land productivity than household plots, which lowers the overall gross agricultural output of the country. A further consequence of the incompleteness of land reform is the financial crisis in Tajik agriculture. Agricultural enterprises and collective dehkan farms currently face a debt crisis caused by a lack of profits and continued bank lending regardless of credit-worthiness. Though the debt crisis is best documented for farms growing cotton, it is a general problem of enterprises and collective dehkan farms. The experience of other countries that have gone through such a debt crisis is that the accumulation of farm debt eventually demonetizes the rural economy. No agricultural enterprise is able to conduct normal buy and sell farming operations when it is burdened by overdue debt.

A second major limitation of the land reform is that managers of agricultural enterprises and dehkan farms are often compelled to plant cotton. Dehkan cotton farmers have much less freedom of decision than other dehkan farms, regardless of the specific organizational form. Hukumat intervention is quite pervasive for cotton growers and virtually nonexistent for other farms. Administrative interference lowers overall incentives and as a consequence cotton-growing farmers make lower profits and achieve lower family incomes.

A third major limitation of the land reform is that managers of farms often have few choices for financing cotton sowing and marketing. In the **FAO 2007-2008 survey**, practically all cotton growers among family dehkan farms (90%) signed forward contracts for cotton with non-bank financial agents who advance inputs for sowing in exchange for a share of the harvest and the exclusive right to gin and market the cotton. The combination of hukumat interference in farm sowing decisions to promote cotton and the monopsonistic position of so-called “futurists” in finance and marketing of cotton make the cotton production system in Tajikistan particularly onerous and often unprofitable for farms.

5.1. The financial crisis in Tajik agriculture

The unreformed sector of agriculture, agricultural enterprises and collective dehkan farms, currently face a debt crisis, which has been caused by a combination of two factors typical of such situations in many countries: (a) the inability of the farms to make a profit under current conditions and (b) continued bank lending regardless of reduced payment capacity and lack of credit-worthiness. Information on the financial state of these farms is scarce, though, according to official figures, the number of corporate farms reporting losses increased from

27% in 1997 to 51% in 2001 (Sel'skoe khoziaistvo respubliki Tadjikistan, 2002). Thus, the financial performance of agricultural enterprises has clearly deteriorated over time. In aggregate they have run net losses since 1998, with the one exception of 2001 (15Years, pp. 478-479). Nevertheless, bank lending to agricultural enterprises increased every year since 1991, so that their share in total bank debt in the economy rose from less than 10% in 1991-93 to more than 60% in 2002-05 (15Years, pp. 473-474). Almost the entire bank debt in farms (more than 95%) is short-term debt for working capital financing. In addition to short-term bank debt farms are also indebted to input suppliers, which have accounted for more than one-third of farm debt in recent years. Thus, in 2005, farms owed 500 million somoni in accounts payable to suppliers on top of 750 million somoni that they owed to the banks (15Years, p. 485), approximately 400 million US dollars.

The debt crisis is best documented for farms growing cotton, the so-called cotton debt issue. Although cotton is grown also in family dehkan farms and in some cases even on household plots, the cotton debt issue has been primarily analyzed for collective dehkan farms and the remaining farm enterprises.

The system for funding the cotton crop was set by Presidential Decree 369 in September 1998. It was designed with the objective of alleviating the working-capital difficulties of cotton-growing farmers. Private investors ("futurists") were to conclude tripartite contracts with a farm and with Agroinvestbank. The contracts were to specify what inputs they were to supply to farms and the amount of cotton they would receive for their services. Agroinvestbank supplied the funds with which the inputs were to be purchased and in return was given the monopoly right to allow cotton to be exported, presumably in order to ensure that all debts to it were paid.¹² It has been repeatedly argued that "investors" grossly overcharged farmers for financing and inputs delivered, and underpaid for cotton received. These pricing problems combined with intrinsically inefficient production led to steady increase of indebtedness.

The debt of cotton farms to private investors increased from less than \$50 million in 1999 to \$400 million in the end of 2007 (**Figure 5.1**). In addition, farms have debt to the budget, tax authorities, and for utilities. According to the National Bank of Tajikistan, this non-investor debt totaled approximately \$62.2 million as of January 2006, but only after the government had written off \$38.5 million in December 2003 under government resolution 542.¹³ In total, the farm debt to investors and non-investor creditors accumulated by January 2006 was about equal to the total amount the World Bank and the Asian Development Bank, taken together, had lent and given Tajikistan since they began operations in the country.

The ongoing transformation of large enterprises into much smaller dehkan farms and the statutory practice of allocating the original farm debt to newly created subunits has led to rapid dispersion of indebtedness across the farming sector: the number of cotton farms in debt increased from 600 (large) farms at the end of 2004 to more than 20,000 (much smaller) farms in the beginning of 2008.¹⁴

¹² In 2003, the procedure was changed so that farms could deliver seed cotton rather than cotton lint to the investors and the Agroinvestbank's monopoly role was eliminated. At the same time Agroinvestbank was reorganized and its cotton debt holdings were moved to the newly created non-bank financial institution "KreditInvest." None of this change the essentials of the system.

¹³ EuropeAid Project on Support to the Development, Implementation and Evaluation of Agricultural Policy of the Republic of Tajikistan, "Notes for a Strategy for the Agricultural Sector of Tajikistan" (processed, 2007), pp. 29, 49, 50.

¹⁴ Natalia Shagaida, personal communication.

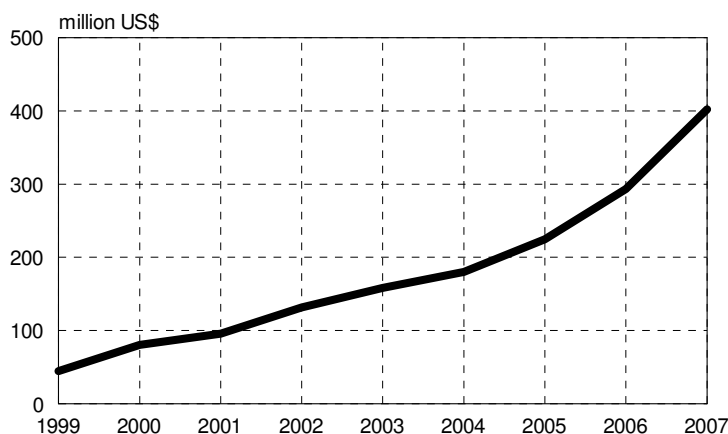


Figure 5.1. Debt of cotton-growing farms to investors, 1999-2007. Source: Don Van Atta (Columbia paper), based on data from IMF (1999) and National Bank of Tajikistan (2000-2007).

Cotton farms – primarily collective dehkan farms, but also many of the remaining farm enterprises – suffer from inefficiency due to inadequate reorganization. This in itself is a major reason for lack of profitability and inevitable rise in indebtedness. Moreover, the government’s insistence on setting targets for cotton production (so-called “state orders”) deprived Tajik farmers of freedom of choice in decisions involving the product mix on their farms and locked them into a rigid cropping and production pattern. Charged with the responsibility of meeting state orders for cotton, district authorities (hukumats), in addition to enforcing cotton sowing targets, began to demand that farmers accept financing by private “investors” outside the banking system in the guise of alleviating working capital problems. The dehkan farmers had to comply with these “recommendations” because the hukumats have the power to confiscate land for “irrational” use (which includes non-compliance with state orders).

Several decrees and resolutions have addressed the problem of cotton farm debt since 2003 (**Table 5.1**), proposing to no avail debt settlement mechanisms, appropriate accounting techniques, and timetables for debt rescheduling and repayment. The growing farm debt problem stimulated the government of Tajikistan to issue Government Resolution 111 entitled a “Plan of Measures for Cotton Farm Debt Resolution in the Republic of Tajikistan for 2007-2009.” This resolution included policy measures aimed at creating a better enabling environment for cotton producers, such as a provision prohibiting district authorities from confiscating land for use “not according to purpose” and provisions guaranteeing no interference in farmers’ freedom to farm. The document also called for the “design [of] procedures on farm debt resolution” by April 2007.

Table 5.1. Cotton debt resolution decrees

Date	Document	Title
April 15, 2003	Presidential decree No. 1054	“On the mechanism for settling the debts of reorganized agricultural enterprises and enterprises undergoing reorganization”
December 23, 2003	Government Resolution No. 542	“On settling the debt of reorganized agricultural enterprises and enterprises undergoing reorganization”
March 4, 2005	Approved by the President	Strategy for cotton farm debt resolution in Tajikistan
June 30, 2006	Presidential Decree No. 1775	“Rule for reorganizing and reforming agricultural enterprises”
March 5, 2007	Government Resolution No. 111	“Plan of measures for cotton farm debt resolution in Tajikistan for 2007-2009”

It is sometimes argued that the farm debt problem is at least one of the factors responsible for the decline in areas cropped to cotton and in total cotton harvest (**Figure 5.2**). Contrary to the agricultural sector as a whole or to wheat as a specific commodity, cotton production did not fully recover after 1997. Unless the debt crisis is resolved and cotton farms are allowed to reach profitability through proper reorganization, the area under cotton will probably continue to decrease.

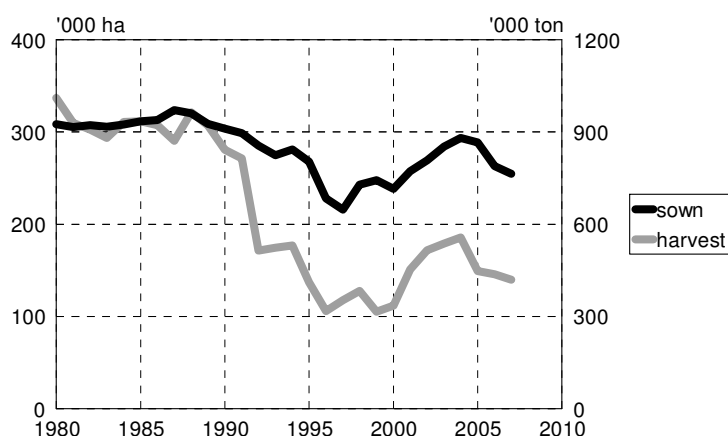


Figure 5.2. Areas in cotton (‘000 hectares, black curve) and cotton harvest (‘000 tons, gray curve), 1980-2007.

The cotton farm debt constitutes a political crisis for the government, because the entire sector has been driven deeper into debt by the banks’ insistence on lending to cotton farms regardless of a lack of credit-worthiness. This crisis will persist, as it does in other transition countries, until systemic measures are adopted aimed at returning lending decisions to a banking sector that is concerned with credit-worthiness, dropping political interference in sowing decisions, eliminating barter contracts, restructuring corporate farms and releasing more land to individual farms. The enabling measures outlined in Government Resolution 111 have not been fully enacted and no procedures to resolve the problem of farm debt have been issued so far. In fact, many of the provisions of Resolution 111 are effectively abrogated by the latest version of the Law “On Land Use Planning” passed in January 2008. An interventionist streak runs through the entire law indicating that the government intends to continue its intervention in farm-level production decisions through the tools of land use planning.

5.2. Administrative Interference and “Freedom to Farm”

The “freedom to farm” issue, i.e., the need to allow farmers to choose freely what crops to plant on their land without intervention from the authorities, can strongly contribute to halting the accumulation of further cotton debt. In response to international insistence, “freedom to farm” was addressed explicitly in Government Resolution 111 (March 2007) related to measures for cotton debt resolution and farm surveys make it possible to explore the extent to which “freedom to farm” is practice in the Tajik countryside.

Two questions in the **2007 USAID/WB survey** covering both collective and family dehqan farms had a bearing on this issue:

D3: Do you **AGREE** or **DISAGREE** (in four gradations) to the following statement: “In most cases, dehkans in our raion are free to decide how they use their land”.

E9: Who makes the decision about what you grow on most of the land where you work?

Table 5.3. “Freedom to farm” perceptions among dehqan farmers (DF)

Do you agree with the “freedom to farm” statement?	Collective DF	Family DF	Who makes the cropping decisions?	Collective DF	Family DF
Agree entirely	29	33	Myself and my family	50	45
Agree somewhat	47	37	Farm manager	37	41
Disagree somewhat	12	14	Local authorities	10	13
Disagree entirely	7	10	Others	0	0
No answer	5	5	No answer	3	1

Source: 2007 USAID/WB survey.

Dehqan farmers as a whole overwhelmingly claim that they have freedom to farm, and only a small minority (10%) think otherwise. Around 10% of all respondents in both collective and family farms disagree entirely with the “freedom to farm statement” (Table 5.3). This matches the 10% of respondents who claim that the local authorities dictate the cropping program. On the other hand, 50% of respondents in both categories say that they make the cropping decisions (absolute “freedom to farm”) and another 40% say that the farm manager makes the decision (relative “freedom to farm”). This roughly matches the 70% of respondents who agree in varying degree with the “freedom to farm” statement. A full cross-tabs analysis of the two “freedom to farm” questions (for farms of both types) shows that among the dehkans reporting that they themselves make the cropping decisions (48% of the combined sample) fully 90% agree in varying degree with the “freedom to farm” statement. It seems that the responses to the two questions are in fact consistent.

Table 5.4. “Freedom to farm” perceptions for cotton-growers and other dehkans

Who makes the cropping decisions?	All dehqan farms		Collective DF		Family DF	
	Cotton growers (26%)	Other dehkans (74%)	Cotton growers (20%)	Other dehkans (80%)	Cotton growers (34%)	Other dehkans (66%)
Myself and my family	14	60	3	63	25	55
Farm manager	56	32	69	28	43	39
Local authorities	28	5	25	6	30	4
Others	0	0	1	0	0	0
No answer	2	3	2	3	2	1

Source: 2007 USAID/WB.

However, this overall picture masks significant differences in decision making patterns between cotton growers and other dehkans. *Cotton growers have much less freedom of decision than other dehkan farms*, regardless of the specific organizational form. *Hukumat intervention is quite pervasive for cotton growers and virtually nonexistent for other farms*. Among cotton-growing dehkan farms, only 14% have freedom of decision, whereas in 56% of the farms the decision is made by the manager and in a staggering 28% of the cotton-growing farms the local authorities (the hukumat) directly intervene in planting decisions (**Table 5.4**). This is in a striking contrast with the decision making process in other dehkan farms, where 60% make the decisions themselves and the hukumat intervenes in only 5% of the cases.

The pattern is basically the same when the dehkan farms are split into collective and family farms. The only difference is the relatively high proportion of family farms reporting that the decision is made by the “farm manager”. If we recall, however, that in family farms the “farm manager” is in most cases the head of the family, we should combine the first two “family” categories into one: among family farms we get “family” decisions in 68% of cotton growers and in fully 94% of other farms.

Among cotton growing farms the incidence of hukumat intervention is higher in Khatlon than in Sogd. The **2008 ADB Small Farmers survey** looked primarily at cotton-growing farms, which reported that hukumat intervened in cropping decisions in 72% of the cases. The intervention rate was higher in cotton-rich Khatlon (77%) than in the relatively more diversified Sogd (66%; the difference is statistically significant by chi-square test). Still, the share of land cropped to cotton was roughly the same regardless of hukumat intervention: slightly more than 70% or about 35 hectares. In Khatlon hukumat intervention did not seem to produce a significant effect on land allocation, whereas in Sogd farms without hukumat intervention allocated less land to cotton (**Table 5.5**).

Table 5.5. Hukumat intervention in cropping decisions by oblast

	Hukumat intervenes in cropping decisions, % of respondents	Land under cotton, %		Land under cotton, ha	
		With hukumat intervention	Without hukumat intervention	With hukumat intervention	Without hukumat intervention
All sample	72	74	71	33	37
Khatlon	77*	76	80	20	59
Sogd	66*	72*	65*	48*	22*

*Differences between categories statistically significant.

Source: ADB Small Farmers, March 2008.

Respondents in the **2008 ADB Small Farmers survey** did not reveal a strong tendency to reduce the areas under cotton if allowed freedom from hukumat intervention, though the reasons for such puzzling behavior are not clear. In an appropriately selected subsample of responses, the share of area under cotton would drop from 73% – the actual figure in 2007 – to 58% as the intended future figure. In terms of hectares, the drop is from 34 hectares under cotton per farm in 2007 to 31 hectares in case of freedom of choice – a decrease of less than 10% in cotton cropping (**Table 5.6**).

Table 5.6. Actual and intended cotton cropping (based on 167 farms with consistent land data)

	Actual 2007	Desired if free to choose
Area under cotton, ha	34	31
Share of land under cotton, %	73	58

Source: ADB Small Farmers, March 2008.

One consequence of constrained sowing decisions for farmers is that their farming incomes should also be constrained as a result. In fact, evidence from the **2007 USAID/WB survey** supports this conclusion: cotton cultivation tends to reduce the probability of reaching a higher income in a survey sample of dehkan farmers. This conclusion holds when analyzing the survey data using multivariate regression analysis. Multivariate analysis modeling family income levels as a function of various endowments produces a statistically significant *negative* coefficient for area cropped to cotton: adding 1 hectare to area in cotton reduces the probability of reaching income “better than village average” by 1.8%. Other endowments – cultivated land area, herd size, and number of possessions – have statistically significant *positive* coefficients. The likelihood of achieving incomes better than the village average *increases* with the increase in the main endowments (cultivated land area, herd size, number of possessions) and *decreases* as the area cropped to cotton becomes larger. In a sense, this is econometric evidence of the negative effect of cotton growing on family income, but unfortunately it relies on fairly weak data.

This conclusion is not discernible in a simple univariate analysis of family income levels versus cotton growing on its own. There is no simple relationship between cotton growing and the perception of family income in the **2007 USAID/WB survey (Table 5.7)**. The likelihoods of being in the “high income” and the “low income” category are practically the same for cotton growers and for farms that do not grow cotton. The differences in share of land under cotton between “high income” and “low income” groups are statistically not significant (and furthermore they go in different directions for collective farms and family farms).

Table 5.7. Cotton growing and family income

	Income higher than average	Income equal to average	Income below average
Grow cotton			
Yes	39	55	6
No	35	58	7
Share of land in cotton, %			
Collective dehkan farms	21	24	30
Family dehkan farms	28	27	19
All dehkan farms	24	26	25

Source: 2007 USAID/WB.

5.3. Financing and marketing cotton: survey findings for family dehkan farms

A third major limitation of the land reform is that managers of farms often have few choices for financing cotton sowing and marketing. Cotton growers are often obliged to sign forward contracts for cotton with non-bank financial agents who advance inputs for sowing in exchange for a share of the harvest and the exclusive right to gin and market the cotton. This problem has often been stressed for agricultural enterprises and collective dehkan farms. However, the issue cuts across all farm types.

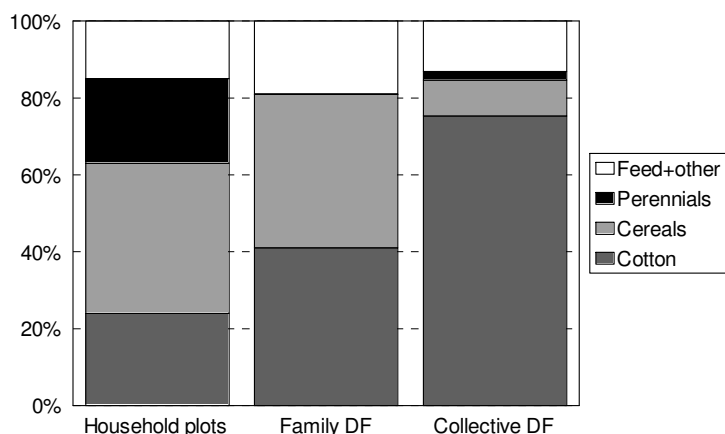


Figure 5.3. Cropping pattern in household plots and dehqan farms (DF). Source: FAO 2007-2008 survey for households plots and family dehqan farms; 2007 USAID survey for collective dehqan farms.

The importance of cotton is the highest for the relatively large collective dehqan farms, which have 75% of their land in cotton (2007 USAID/WB survey; average farm size about 20 hectares). It is lower for family dehqan farms, which allocated 40% of their cultivated area to cotton (2007 USAID/WB survey, FAO 2007-2008 survey; average farm size less than 10 hectares) and lowest for the small household plots, which report about 25% of land in cotton (FAO 2007-2008 survey; average plot size less than 2 hectare). The cropping pattern for farms of the three types is shown in Figure 5.3. These shares should be taken only as rough estimate for comparison purposes, since they are derived from two different surveys. The 2007 USAID survey provides information on collective dehqan farms, while the FAO 2007-2008 survey is the source of information on family dehqan farms and household plots. Nevertheless, the general tendency is supported by the assessment of experts as well, who claim that collective dehqan farms and agricultural enterprises tend to have a higher portion of sown area in cotton.

Throughout the rest of this section we present the findings for family dehqan farms covered by the FAO 2007-2008 survey and the 2008 ADB Small Farmers survey.

Sources of finance for family dehqan farms

In the FAO 2007-2008 survey, practically all cotton growers among family dehqan farms (90%) sign forward contracts for cotton deliveries, and again practically all of them sign up with futurists (Table 5.8). Farmers typically contract to deliver all their cotton to the client (over 80% of farmers with contracts). On average, contract payments are evenly divided between cash and payment in kind (52% of contract value paid in cash, 48% paid in kind).

Table 5.8. Forward contracts among cotton-growing family dehqan farms

	Respondents	Percent
Cotton growers (47% of all sample)	64	100%
Sign forward contracts	57	89%
Contracts with futurists	53	83% (91% among those reporting client, n=58)
Contract a disadvantage	43	67%
Disadvantage among those with futurist contracts (n=53)	38	72%

Source: FAO 2008.

In the 2008 ADB Small Farmers survey, farmers predominantly rely on financing from investors (“futurists”), who financed (sometimes in combination with other sources) about

70% of the production costs for the 2007 cotton harvest. Commercial banks contributed another 12% of production costs, while 14% was self-financing (**Table 5.9**). Most farmers (233, or 72% of the respondents) use a single source of financing, which in more than half the cases is the investor (**Table 5.9**). Self-financing is the second-ranking source, reported by 30% of farmers who finance from a single source.

Table 5.9. Cotton financing sources in 2007

Financing source	Share of 2007 production costs financed from this source, % (n=323)	Farmers resorting to this source, % (n=323)*	Farmers financing from a single source, % (n=233)
Investors	68	62	54
Banks	12	14	11
Self-financing	14	46	30
Other	6	9	5
Total	100	--	100

*Numbers add up to more than 100% because farmers use multiple sources of financing.

Source: 2008 ADB Small Farmers survey.

For farmers with a *single source of financing*, investors are the leading source contributing 71% of production costs, with commercial banks trailing far behind with a 15% share (**Table 5.10**). Among farmers with *two sources of financing*, investors retain their dominant role (59% of production costs), but it is self-financing that emerges as the second most important source (30% of costs). Banks are in third place with an 8% share for this of farmers with diversified financing.

Table 5.10. Share of production costs financed from different sources (percent of 2007 cotton harvest)

Financing source	Farmers financing from a single source (n=176)	Farmers financing from two sources (n=72)	Farmers financing from three sources (n=8)
Investors	71	59	69
Banks	15	8	4
Self-financing	8	30	15
Other	6	3	12
Total	100	100	100

Source: 2008 ADB Small Farmers survey.

In general, larger farms have to turn to investors at least for part of their financing, while the smaller farms rely on self-financing. Among farmers with a single source of financing in the **2008 ADB Small Farmers survey (Table 5.11)**, those with least land (11 hectares under cotton) rely on self-financing, while those with most land (46 hectares under cotton) finance through investors (the differences between the two extreme groups are statistically significant). The same general tendency is observed when we compare the area in all farms that use investor financing (whether as a single source or as one of multiple sources) with the area in all farms that use self-financing: the average land under cotton in investor-financed farms is 44 hectares, while the average land under cotton in self-financed farms is 20 hectares (bank-financed farms fall in the middle with 40 hectares).

Table 5.11. Relationship between financing modes and land

	Area in cotton, ha	Total cropped area, ha
Single financing source	33	48
Multiple financing sources	36	64
For farms with a single financing source:		
Investor	46*	64*
Bank	30	39
Self-financed	11*	19*
All financing sources:**		
Investor	44	67
Bank	40	76
Self-financed	20	33

*Difference between investor-financed and self-financed farms statistically significant by both Anova and Wilcoxon tests.

**Differences cannot be tested for statistical significance because of data structure.

Source: 2008 ADB Small Farmers survey.

Satisfaction rating of investor financing among family dehkan farmers

In the **FAO 2007-2008 survey**, about 70% of family dehkan farmers consider forward contracts a disadvantage. In the **2008 ADB Small Farmers survey**, the satisfaction rating of investor financing is mixed. Among the 201 respondents who reported using investor financing in 2007, 40% are dissatisfied, while 30% are satisfied and 30% are undecided. The complaint that investors charge excessive prices for the inputs supplied is the single main reason for dissatisfaction: 79% of dissatisfied respondents cite this factor. The next significant complaint (63% of dissatisfied respondents) is that the investors pay below market price for cotton. Two other reasons – production inputs not delivered on time and cash is not paid during cotton picking – are cited by about half the respondents (**Table 5.12**).

Table 5.12. Reasons for dissatisfaction with investor financing in 2007

	Dissatisfied with investors*	Prices charged for inputs too high**	Prices paid for cotton too low**	Inputs not delivered on time**	Cash not paid during picking**
Percent of respondents	41	79	63	51	45

*Percent of 201 respondents who used investor financing in 2007.

**Percent of 82 respondents who expressed dissatisfaction with investor-based financing in 2007.

Source: 2008 ADB Small Farmers survey.

The relatively poor experience with investors as a source of financing has triggered a shift in plans for the future. Although only 140 respondents in the **2008 ADB Small Farmers survey** specified their financing plans for 2008 (compared with 323 farms in 2007), there is an obvious expectation of being able to reduce dramatically the share of financing from investors while increasing bank financing and financing from own sources (**Table 5.13**). Thus, farmers wish to reduce the share of cotton crop financed by investors from nearly 70% to 37%, while increasing the share of banks and self-financing from about 30% in 2007 to 60% in 2008. There seems to be a good chance that the farmers will be able to accomplish, at least partially, this shift to non-investor financing as two-thirds of respondents indicated that they were not instructed by the *hukumat* to enter into an agreement with a specific investor. It is noteworthy that practically the same frequency of “no intervention” replies is observed even among the farmers who receive binding instructions from *hukumat* regarding the allocation of area to cotton (a large majority of 72% of respondents).

Table 5.13. Share of production costs financed from various sources: 2008 expectations and 2007 situation

Financing source	Share of 2008 production costs to be financed from this source, % (n=140)	Share of 2007 production costs for matching farms, % (n=136)	Share of 2007 production costs for all farms, % (n=323)
Investors	37	66	68
Banks	30	8	12
Self-financing	30	21	14
Other	3	5	6
Total	100	100	100

Source: 2008 ADB Small Farmers survey.

Debt levels and repayment capacity for family dehkan farms

In contrast to the debt crisis in collective dehkan farms and agricultural enterprises, debt does not appear to be a problem for family dehkan farms. Actual debt levels could be estimated only for a sample of 135 family dehkan farmers in the **FAO 2007-2008 survey**. Among these, less than 30% report that they have any farm debt. Most of these “indebted” farmers (31 out of 39) are cotton-growers, and their mean debt is significantly higher than the mean debt of other family dehkans (**Table 5.14**). The debt to futurists represents nearly 70% of total debt averaged over all cotton-growing farms. Less than half the cotton-growing farms have debt to futurists, however, and in these farms futurists account for virtually the entire debt.

Debt levels of 23,000 somoni per farm or even 42,000 somoni in the relatively small number of family dehkan farms (15) reporting debt to futurists are not unacceptably high compared to other farm performance measures in the survey (**Table 5.15**). Rough estimates of farm net income obtained by subtracting reported production costs from the value of production or even from sales revenue indicate that these farms generate sufficient surplus to repay their debt within less than a year. Still, the debt-to-sales measure shows that farms with debt to futurists are more indebted than the average farm: their debt levels run at 6 months of sales compared with only 4 months of sales on average.

Table 5.14. Total debt and futurist debt in family dehkan farms

	All dehkan farms with debt (n=39)	Cotton-growers (n=31)	Other farms (n=8)
Total debt, somoni	22,960	28,150*	2,850*
Share of debt owed to futurists	68%	69%	--
Percent of farms indebted to futurists (n=15)	39%	45%	
Share of debt owed to futurists in farms indebted to futurists (n=15)	86%	86%	--

*Difference statistically significant by t-test.

Source: FAO 2008.

Tabel 5.15. Debt and repayment capacity in family dehkan farms

	All farms with debt (n=39)	Farms with debt to futurists (n=15)
Mean debt, somoni	23,000	41,800
Debt to futurists, somoni		36,000
Revenue from farm sales, somoni	63,800	83,300
Value of production (crops and livestock), somoni	69,900	85,600
Production costs (incl. hired labor), somoni	12,100	16,400
“Profit” based on value of production	57,500	77,300
“Profit” based on sales revenue	49,300	65,600
Debt-to-sales, months to repay	4.3	6.0

Source: FAO 2008.

It should be stressed that these relatively optimistic findings have been obtained for a small sample of *family* dehkan farms. The debt of *collective* dehkan farms is not included in the analysis. Further research along these lines for both family and collective dehkan farms is obviously indicated.

6. Conclusions

The “Presidential Lands” decrees of 1995 and 1997 and the series of legislative acts on the formation of dehkan farms were watershed policy changes leading to the recovery of agricultural output in Tajikistan. Before these changes growth of agricultural output in Tajikistan followed the pattern typical of CIS countries--intense growth in the Soviet period through 1980, stagnation during the 1980s and a transition decline from 1991 to 1997 caused by the disintegration of the Soviet agricultural system. Agricultural growth was restored only after the peace accord in 1997 and the beginning of land redistribution to household plots in 1995.

Land reform has had significant achievements in Tajikistan.

The main achievement of land reform in Tajikistan has been the rapid recovery of agricultural production since 1997. The achievements of this recovery are shown in **Table 6.1** below. Agricultural output and livestock inventories have been restored to their 1991 levels, and crop production in 2006 was 30% higher than its level in 1991.

Table 6.1. Schematic patterns of change in Tajik agriculture after 1990

Variable	1990-97	1997-2006	2006 relative to 1991
Agricultural output	Decline	Recovery	Close to 1991 level
Livestock	Decline	Recovery	Inventories back to 1991 level, production at 45% of 1991 level NEED 2007 PROD
Crops	Decline	Recovery	30% higher than 1991 NEED 2007 DATA
Agricultural labor	Increase	Increase	50% higher than 1991 NEED 2007 DATA
Arable land	Stable	Stable	Unchanged
Irrigation	Stable	Stable	Unchanged
Farm machinery	Collapse	Collapse	60% of 1991 for tractors and grain combines; 20% of 1991 for cotton combines
Fertilizer	Apparent decline	Stable	Apparently less than 1991

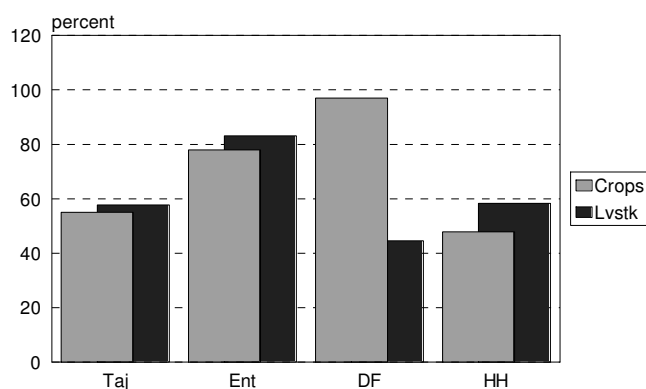
Perhaps even more impressive has been the predominant role of productivity growth in the recovery of agricultural production in Tajikistan. The rationale behind agrarian reform has always been the potential productivity gains from the transfer of land and other assets from collective and state farms to privately owned farms. Therefore, an important indicator of the success of reforms is the presence or absence of productivity increases as a source of recovery.

In terms of productivity growth and relative levels of productivity, household plots now dominate agriculture in Tajikistan. We saw in **chapter 4** that most of the growth in GAO can be attributed to productivity increases, and the lion’s share of productivity increases has come from household plots. **Figure 6.1** illustrates the point by showing the portion of recovery growth attributable to resources (land and inventories) for crop and livestock production. For crops (75% of total agricultural production in 2006) 45% of growth in household plots was attributable to increases in sown land, so that 55% can be attributed to productivity growth. Compare this to the record for agricultural enterprises and dehkan farms, where only 3 to 20 percent of growth was attributable to productivity increases. In the livestock sector 40% of the recovery of production in household plots can be attributed to productivity growth.

The productivity figures of **chapter 4 (Figures 4.9 and 4.10)** illustrated the dominance of household plots in Tajikistan in terms of the levels of land and livestock productivity and the lack of progress in enterprises and dehkan farms. Productivity levels in household plots are 3 to 5 times higher than those in enterprises and dehkan farms, which are practically indistinguishable. The lack of productivity progress of agricultural enterprises and dehkan farms are a sign of the failure of efforts to reform agriculture through restructuring collective farms along these lines. The more successful model of reform in Tajikistan has been the redistribution of land to household plots.

The land reform has also most likely led to an improvement of rural family incomes through increases in land in household plots and family dehkan farms. In **chapter 4** it was demonstrated that cross section surveys of rural households show a clear relationship between family income and cultivated area in both types of individual farms.

Figure 6.1. Share of GAO recovery (1997-2006) attributable to resources, by farm type (enterprises, dehkan farms and household plots).



However, land reform has not lived up to its potential, because . . .

Despite these undeniable achievements, Tajik agriculture has achieved far less than other CIS countries with more successful land reforms. In this respect the Tajik land reform has been a disappointment. There appear to be three reasons why land reform has not lived up to its potential in Tajikistan. First, the recovery of agriculture is built on a relatively tiny base in terms of land resources; second, Tajikistan has retained a large role for administrative intervention in farm decision making; third, the failure to follow through on land reform has prevented the government from attending to the longer term needs of agriculture, rural development and natural resource management.

. . . the recovery of agriculture is built on a tiny resource base,

Despite producing 61% of agricultural output, household plots hold less than 6% of agricultural land in Tajikistan and less than 20% of arable land (2007). This implies that 80% of sown land is still held in farms that have far lower productivity, representing a huge loss of potential production. If dehkan farms and agricultural enterprises in Tajikistan had achieved the same level of productivity as household farms agricultural production in the country would have been 114% higher in 2006 (**Table 6.2**). If dehkan farms and agricultural

enterprises had achieved only half the productivity level as household farms agricultural production in Tajikistan would have been 37% higher.

Table 6.2. Comparison of actual GAO and potential GAO with productivity levels of household farms, 2006 ('000 somoni)

Gross agricultural output	Total	Total potential compared to actual	Household farms	Dehkan farms	Agricultural enterprises
Actual 2006 production	3,659,306	100	2,237,937	948,859	472,510
2006 production with productivity levels in dehkan farms and enterprises at <i>half</i> the level of household farms	5,027,475	137	2,237,937	1,742,770	1,046,768
2006 production with productivity levels in dehkan farms and enterprises at the level of household farms	7,817,013	214	2,237,937	3,485,540	2,093,536

Calculations by the authors based on actual 2006 GAO figures.

A comparison of the situation in Tajikistan with the one in Azerbaijan gives an appreciation of the potential connection between land reform and GAO. Only 2% of sown land is held in corporate farms (2005) in Azerbaijan, so that land productivity found in individual farms is practically the same as for the entire sector. Just as in Tajikistan, in Azerbaijan a similar gulf exists between the productivity of land (here shown in physical output per ha rather than value of production per ha) in individual farms (primarily household plots) and agricultural enterprises (**Figure 6.2**). But, unlike in Tajikistan, land in Azeri agricultural enterprises was transferred to individual farms quite rapidly between 1995 and 2000. The portion of sown land in individual farms rose from 2-3% in 1991 to 98% after 2000. This transfer caused aggregate crop yields to rise from the level of agricultural enterprises to that of individual farms. The rise in aggregate yields drove a robust recovery of crop production. **Figure 6.2** illustrates the transition of aggregate crop yields in Azerbaijan (thin black line) from near the level of agricultural enterprises (thick grey line) to that in individual farms (thick black line).

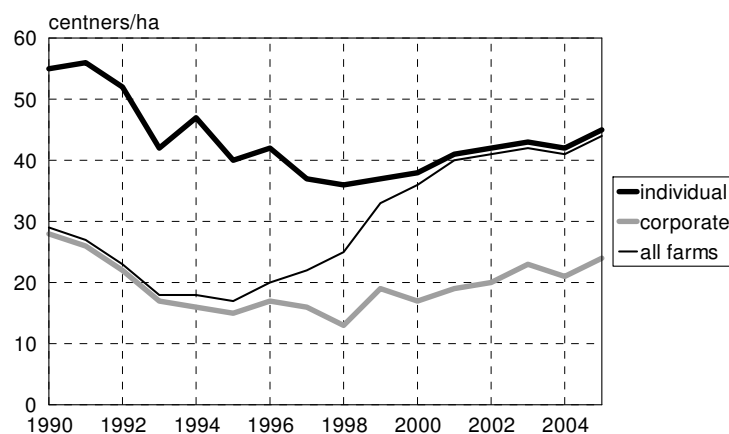


Figure 6.2. Aggregated crop yields for individual and corporate farms in Azerbaijan, 1990-2005 (centners/ha). Source: aggregations based on Statistical Committee of Azerbaijan (various years).

This extraordinary rise in yields was the result of the “double yield increase” effect combining the impact of the transition from corporate to individual farms as well as the overall increase in yields in both sectors since 1998-99. As the share of individual farms in cropped land increased from 2-3% in the early 1990s to 98% after 2000, the aggregated yield curve was pushed up from the lower level corresponding to yields in corporate farms to the higher level corresponding to yields in individual farms. This “farm type” effect bridging over the vertical distance between the yields curves for corporate and individual farms was further augmented

by the overall increase of yields observed after 1999 in both sectors. This “double yield increase” effect was the basis for the recovery of crop production in Azerbaijan. Such a “double yield increase” has not occurred in Tajikistan because of the small portion of sown land transferred to household plots.

Lost production potential due to low productivity is not the only cost of the limited land reform in Tajikistan. A further consequence of the incompleteness of land reform is the financial crisis in Tajik agriculture discussed in **chapter 5**. Agricultural enterprises and collective dehkan farms face a debt crisis caused by a lack of profits and continued bank lending regardless of credit-worthiness. Though the debt crisis is best documented for farms growing cotton, it is a general problem of enterprises and collective dehkan farms. The experience of other CIS countries that have gone through such a debt crisis (including Moldova, Ukraine, Kazakhstan and the Russian Federation) is that the accumulation of farm debt eventually demonetizes the rural economy. No agricultural enterprise is able to conduct normal buy and sell farming operations when it is burdened by overdue debt.

. . . government administration has retained a large role for intervention in farm decision making and regionalized financing and marketing monopsonies . . .

A second reason why the Tajik land reform has not lived up to its potential is that the government administration has retained a large degree of control over farm level decision making, financing and marketing in the cotton sub-sector. *Ad hoc* intervention is most evident in the direct intervention of the hukumat in planting decisions. Evidence from the **2007 USAID/WB survey** indicates that hukumat intervention is quite pervasive for cotton growers and virtually nonexistent for other farms. Among cotton-growing dehkan farms only 14% believe they have the freedom to make their own planting decisions and in 28% local authorities (the hukumat) directly intervene. This is in a striking contrast with the decision making process in other dehkan farms, where 60% make the decisions themselves and hukumats intervene in only 5% of the cases.

In the area of financing and marketing cotton managers of farms often have very few choices. Cotton growers are often obliged to sign forward contracts for cotton with non-bank financial agents who advance inputs for sowing in exchange for a share of the harvest and the exclusive right to gin and market the cotton. In the **FAO 2007-2008 survey** of family dehkan farms practically all cotton growers signed forward contracts for cotton deliveries, and practically all of them signed up with futurists. In the **2008 ADB Small Farmers survey** family dehkan farmers predominantly relied on financing from investors (“futurists”), who financed about 70% of the production costs for the 2007 cotton harvest. The majority of farms in the **FAO 2007-2008 survey** using such arrangements considered such contracts a disadvantage primarily because investors charge excessive prices for the inputs supplied and pay below market price for cotton.

Administrative intervention in farm sowing decisions and regional financing and marketing monopsonies are holdovers from Soviet planning and are not compatible with market agriculture. The administrative controls on cotton sown area, as well as the monopsonistic position of “futurist” financiers cause farm returns to raising cotton to be less than they could be. Evidence from the **2007 USAID/WB survey** presented in **chapter 4** suggests that cotton cultivation tends to lower family incomes in a survey sample of dehkan farmers. Limited returns are an important factor in the continued fall in cotton yields and production. Other crops without heavy administrative intervention, including wheat, have shown increasing

yields in the past few years. Amongst the major crops, only cotton yields have fallen so dramatically (**Figure 4.14**).

If the policy goal of the government is to support the production of cotton as a source of export revenues a more effective policy would be to

- halt administrative intervention in cotton sown areas;
- eliminate the monopsonistic position of futurists in cotton financing, ginning and marketing; and
- create competitive markets for financing, ginning and marketing cotton in Tajikistan.

If necessary, in the future, the state could offer tax or subsidy incentives to farms for cotton production, regardless of organizational form. However, the first and more important steps are to eliminate administrative intervention and the monopsonistic position of futurist financiers in cotton production.

... and failure to follow through on land reform has prevented the government from attending to the longer term needs of agriculture and the rural population.

The third reason why the land reform in Tajikistan has not lived up to its potential is that the failure to follow through on land reform has prevented the government from attending to the longer term needs of agriculture, rural development and natural resource management. Land reform is a basic first step toward the construction of a viable, sustainable agriculture that can be an adequate source of rural livelihoods in Tajikistan, though there are many further steps that will be necessary. The failure to take the first and most basic step preserves an underperforming agriculture, keeping the rural population on the brink of food insecurity, agriculture particularly susceptible to natural disaster and government without adequate tax revenues from the sector. The government's concern with emergencies and basic livelihoods is shared by the donor community in Tajikistan. Most foreign aid in Tajikistan directed toward the rural sector is in one way or another aimed at ensuring the basic livelihoods for the population, rather than attending to the longer term needs for agriculture, rural development and natural resource management.

Land reform by itself is not sufficient to ensure the development of a viable and sustainable agriculture in Tajikistan, nor is it sufficient to ensure sustainable rural livelihoods. There are many other complementary steps to be taken to ensure these development goals. However, failure to ensure that the first steps are taken in Tajikistan has unfortunately hindered serious consideration of further steps. Ultimately, this is the important role of land reform that remains unfulfilled in Tajikistan.

FAO Regional Office for Europe and Central Asia
Policy Studies on Rural Transition

2009-3	<i>Agricultural Recovery and Individual Land Tenure: Lessons from Central Asia.</i> Zvi Lerman and David Sedik
2009-2	<i>The Feed-Livestock Nexus in Tajikistan: Livestock Development Policy in Transition.</i> David Sedik
2009-1	<i>Agrarian Reform in Kyrgyzstan: Achievements and the Unfinished Agenda.</i> Zvi Lerman and David Sedik
2008-1	<i>The Economic Effects of Land Reform in Tajikistan.</i> Zvi Lerman and David Sedik



Regional Office for Europe and Central Asia
Food and Agriculture Organization of the United Nations
34 Benczur ut.
1068 Budapest, Hungary

Telephone: +36 1 461 2000

Fax: +36 1 351 7029

<http://www.fao.org/world/Regional/REU>