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Tajikistan: An Overview of Land and Farm Structure Reforms

by

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Tajikistan: An Overview of Land and Farm Structure Reforms[1]

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Tajikistan is a highly agrarian country, with its rural population at more than 70% and agriculture accounting for 60% of employment and around 30% of GDP (**Table 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 Tajikistan's 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). The low income and the high agrarian profile justify and drive the efforts for agricultural reform in the hope of improving the population's well being.

Table 1. The importance of the agrarian sector for Tajikistan

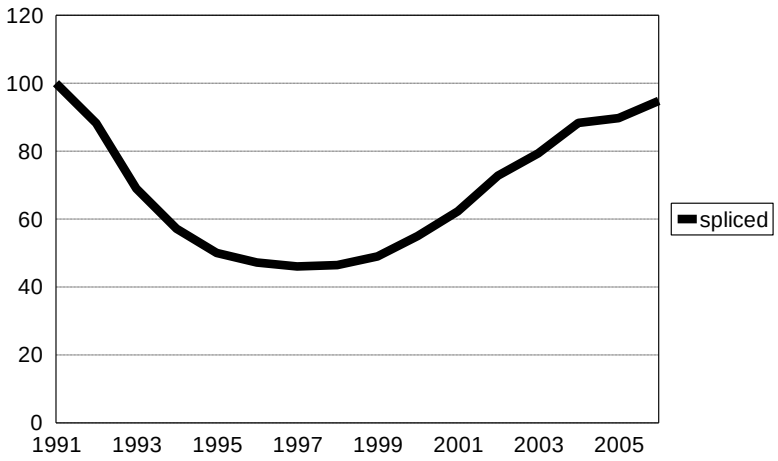
	Share of rural population	Share of agricultural employment	Share of agriculture in GDP
1995	72.6	59.0	36.7
1996	73.2	59.1	36.0
1997	73.3	63.9	32.0
1998	73.4	60.7	25.1
1999	73.5	64.3	25.4
2000	73.4	64.9	27.0
2001	73.5	66.6	26.5
2002	73.6	67.6	22.2
2003	73.5	67.6	24.2
Average	73.3	63.8	28.3

Changes in agricultural output and input use

Tajikistan's agricultural production (as measured by the index of GAO – Gross Agricultural Output) has shown remarkable recovery since 1997 following the deep transition decline after independence (**Figure 1**; data for the Soviet period show that the transition decline was preceded by decades of steady agricultural growth, as the GAO index trebled between 1960 and 1988). Today GAO is almost back to the 1991 level after more than doubling from the lowest point in 1997.

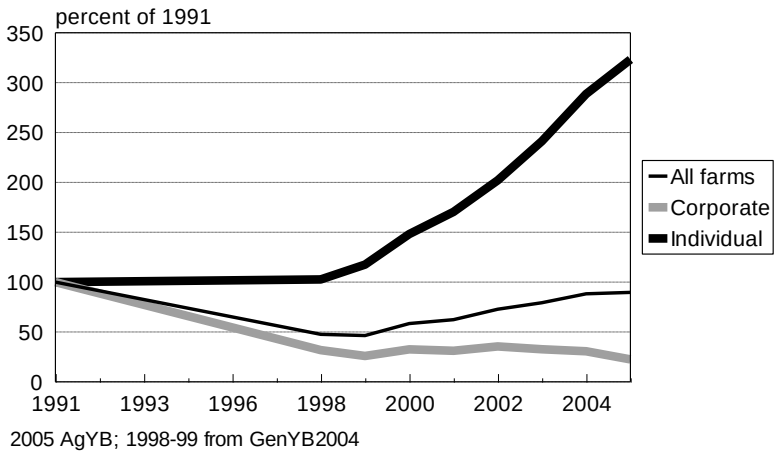
Agricultural recovery since 1997 has been entirely due to growth in the individual farm sector. **Figure 1A** breaks down the GAO growth into the two main components of Tajik agriculture: individual farms (household plots and dekhkan farms) and corporate farms (the successors of formers kolkhozes and sovkhozes). The output of corporate farms at best stabilized in 1999, and so far it has not shown any positive growth or recovery (gray curve in **Figure 1A**). The output of individual farms, on the other hand, did not decline even in the early years of transition (1991-1997) and it more than trebled between 1998 and 2005 (thick black curve in **Figure 1A**). It is this dramatic increase of production in the output sector that obviously drove up the aggregate agricultural output in Tajikistan (thin black curve in **Figure 1A**).

[1] The material for this report was collected in December 2007 during a mission to Tajikistan on behalf of FAO's Regional Office for Europe and Central Asia.



Source: AgYB 2001, 2006 (constant 2003 prices)

Figure 1.



2005 AgYB; 1998-99 from GenYB2004

Figure 1A.

Agricultural production relies on three main resources: land, labor, and animals. In addition, production also depends on availability of farm machinery and purchased inputs (e.g., fertilizers), but the data for these resources are not readily accessible.

Figure 2 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 3.8 million hectare in 2006. 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.

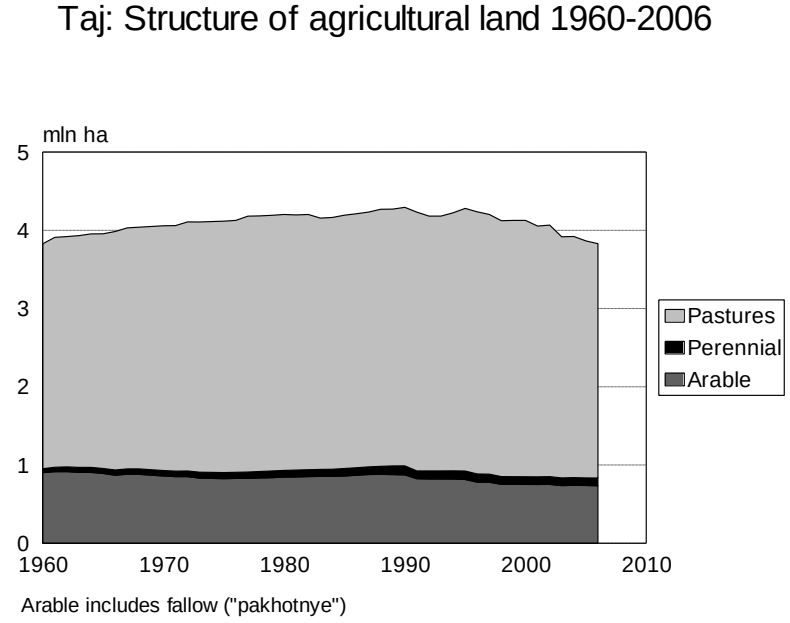


Figure 2.

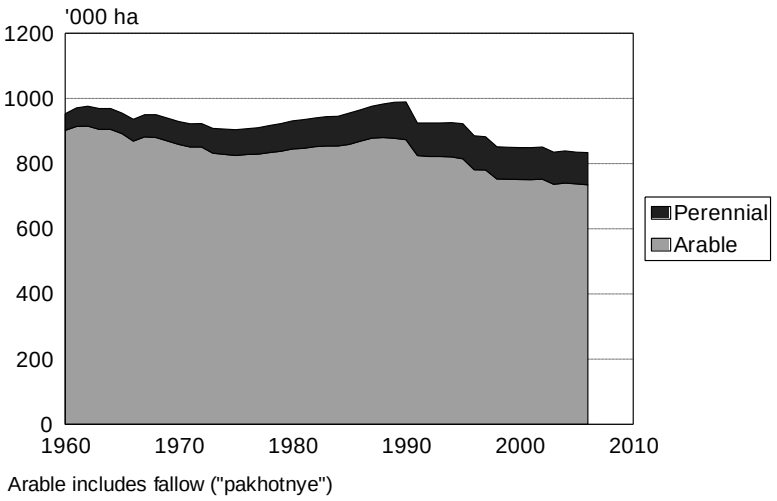


Figure 3.

The structure of cultivable land – arable land and land under orchards and vineyards – is shown separately "through a magnifying glass" in **Figure 3**. There has been a general decline in cultivable land since 1990 (from nearly 1 million hectares to 750,000 hectares in 2006), which was matched by a similar decline in pastures. The observed decline in agricultural land is thus the outcome of commensurate declines in both main components.

Arable agriculture in Tajikistan has always relied heavily on irrigation. Figure 4 shows how the irrigation-ready area increased from 450,000 hectares in 1960 to nearly 750,000 hectares in 2006. The share of arable land covered by irrigation networks increased over time from 50% in the 1960s to 70% in 1990. Although there has been little expansion of irrigation in absolute terms after 1990, practically 100% of arable land is irrigation-ready today due to the decline in arable areas since independence (**Figure 4**).

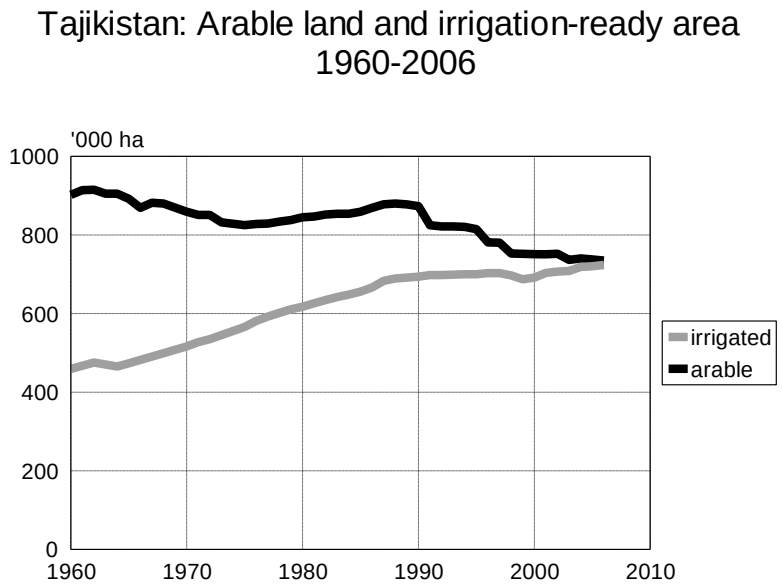


Figure 4.

Agricultural labor – the number of people employed in agriculture, including the self-employed – steadily increased since 1980, rising from 600,000 to nearly 1.3 million in 2003 (Figure 5, Table 2). The growth of agricultural labor actually accelerated after independence: between 1980 and 1990 agricultural labor grew at an annual rate of 3.0%, whereas between 1990 and 2003 it grew at 3.3% per annum. 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 of close to 3% since 1980. Rural population growth appears to be the main determinant driving the increase in agricultural labor, although the somewhat faster growth of agricultural labor (3.2% compared with 2.7% 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 below).**

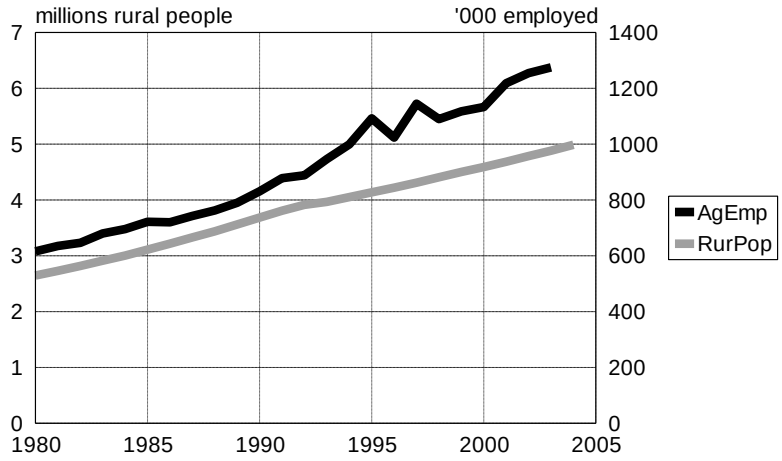


Figure 5.

Table 2. Agricultural labor and rural population in Tajikistan, 1980-2003

	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

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 6** 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.

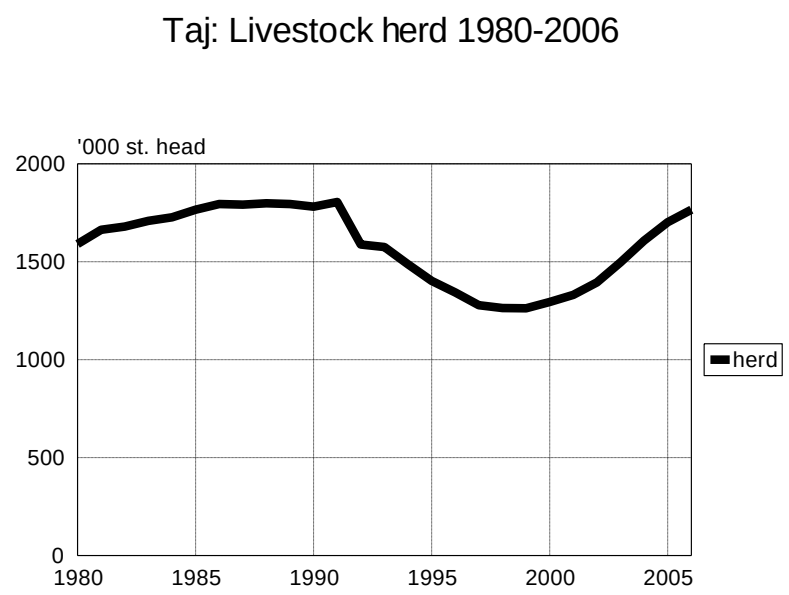


Figure 6.

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 6A**). The level of feed harvested has also fallen sharply and in 2006 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 nearly 400,000 hectares (more than 10%) in pastures since 1990-1995 (see Figure 2) indicate sharp contraction of the feed base for both cattle and sheep.

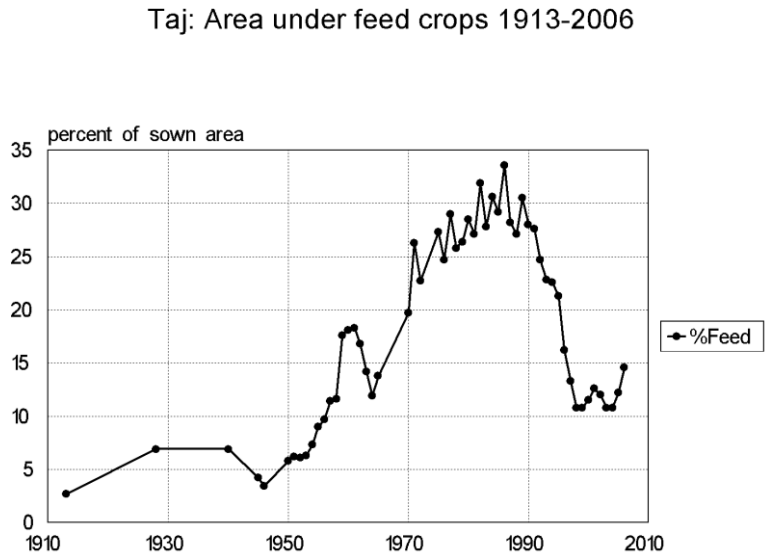


Figure 6A.

Farm machinery inventories literally collapsed after 1990 following decades of robust growth in the Soviet era (**Figure 7**). The number of tractors shrank from 37,000 in 1991 to 19,000 in 2006; the number of grain harvesters dropped from a high of 1,500-1,600 in the early 1990s to 900 in 2006; and the number of cotton harvesters skidded from 3,000 in 1991 to less than 600 in 2006.

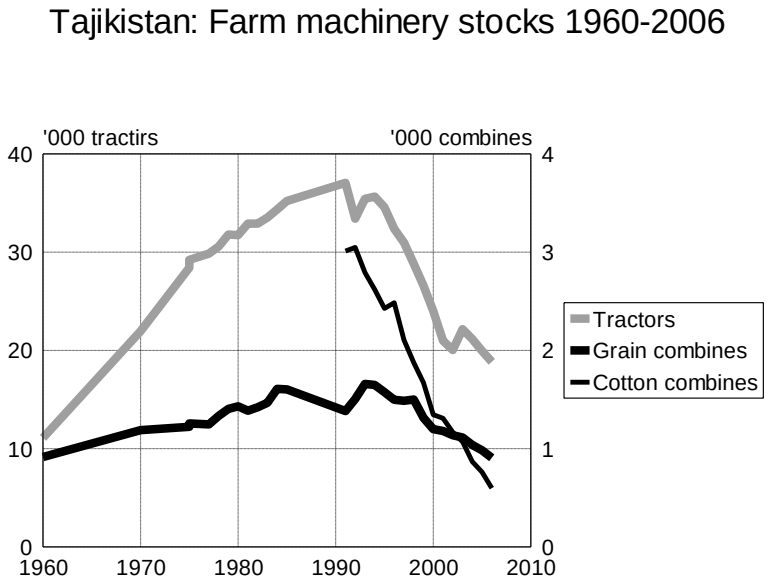


Figure 7.

A similar downward pattern is observed for **fertilizer use**, although the data here are even less complete or consistent than for farm machinery. **Figure 8** 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 2006). 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), but meaningful comparison requires corresponding numbers for other countries (preferably market economies).

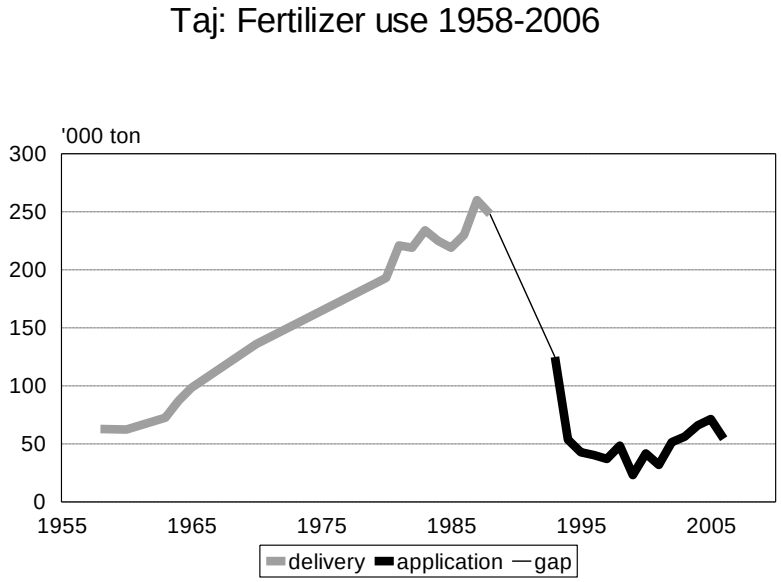


Figure 8.

Summarizing the discussion of outputs and resource use in post-Soviet Tajikistan, we can say that agricultural production recovered in 1997 after an initial transition decline; 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. The use of purchased inputs, including farm machinery and fertilizer, seems to have undergone severe shrinkage since the mid-1990s. These results are schematically summarized in **Table 3**.

Table 3. Schematic patterns of change in Tajik agriculture after 1990

Variable	Early 1990s	Late 1990s-2000s	2006 relative to 1991
Agricultural output	Decline	Recovery	Close to 1991 level
Livestock	Decline	Recovery	Back to 1991 level
Agricultural labor	Increase	Increase	50% higher than 1991
Arable land	Decrease	Decrease	15% below 1991
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

Changes in farm structure and land tenure since independence

The changes in output and resource use are taking place against the backdrop of ongoing agrarian reforms. Agricultural land is at the center of the reform agenda in any country, and we will now show how the structure of land use has changed since the Soviet period.

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.

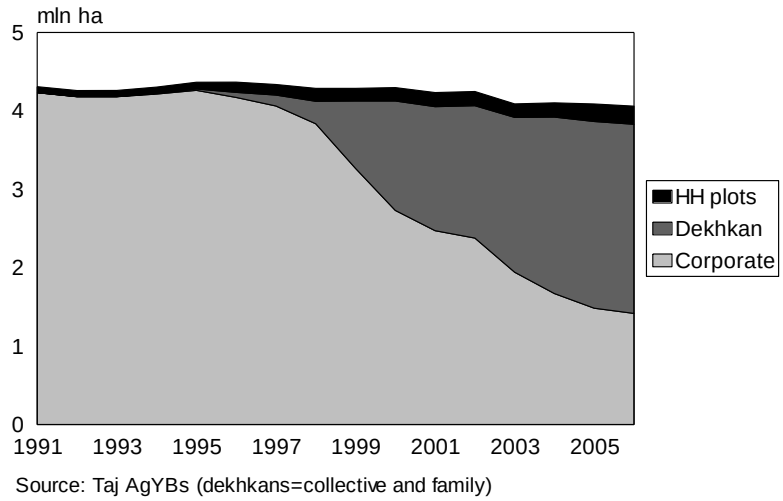


Figure 9.

Figure 9 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 35% in 2006. Much of this land shifted to new emergent farm structures – the so-called dekhkan farms, which now control close to 60% of agricultural land, substantially more that what remains in corporate farms. The remaining 5%-6% of agricultural land are in household plots, which have increased their share many-fold from the traditional 1% in the Soviet period. Since household plots have virtually no pastures, their share in arable land is much higher than in agricultural land, approaching a respectable 20% in 2006. **Figure 10** 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.

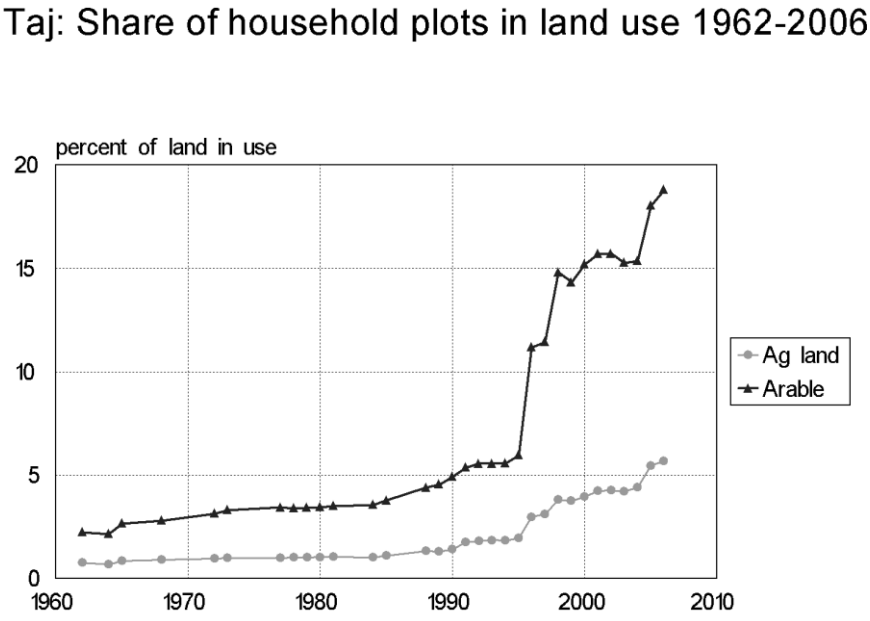


Figure 10.

While the 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 of the dekhkan

farms represented by the dark-gray wedge in Figure 9 are also individual or family farms, but unfortunately not all of them. A large part of dekhkan farms are in fact *collective* dekhkan 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 dekhkan farms need to be separated into *collective* dekhkan farms and *family/individual* dekhkan farms. Unfortunately no official statistical data exist to enable us to perform this separation. Partial information obtained from the Tajikistan State Land Committee suggests that fully two-thirds of dekhkan farms are in fact family or individual dekhkan farms, and their land should be counted, together with household plots, as land in the individual farm sector. It would thus seem that the individual sector in Tajikistan – including household plots and family dekhkan farms – controls today more than 45% of agricultural land (and an even higher share of arable land). These estimates are summarized in **Table 4**.

Table 4. Estimates of the share of individual and corporate sector in land based on Goskomstat and Goskomzem data (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 dekhkan farms, %	59	60
Estimated share in family dekhkan farms (2/3 of dekhkan farms), %	39	40
Estimate for individual sector (household plots and family dekhkan farms), %	45	60
Estimate for corporate sector (enterprises and collective dekhkan farms), %	55	40

The reforms implemented since 1990, and especially after 1995, have affected not only the structure of land tenure, but also the distribution of the livestock herd across farms of different types (**Figure 11**). ompared with the situation in 1990 when only 62% of livestock was held outside of corporate farms. The individual sector controlled most of the livestock even back in the Soviet era, when more than 60% of the herd (in standard head) were in household plots. By In 2006 the share of household plots in livestock had risen to 90% (measured in standard head). Moreover, **Figure 11** clearly demonstrates that the increase in livestock head count since 1995 is entirely attributable to the increase in the individual sector, which has more than offset the shrinkage of livestock in corporate farms (enterprises).

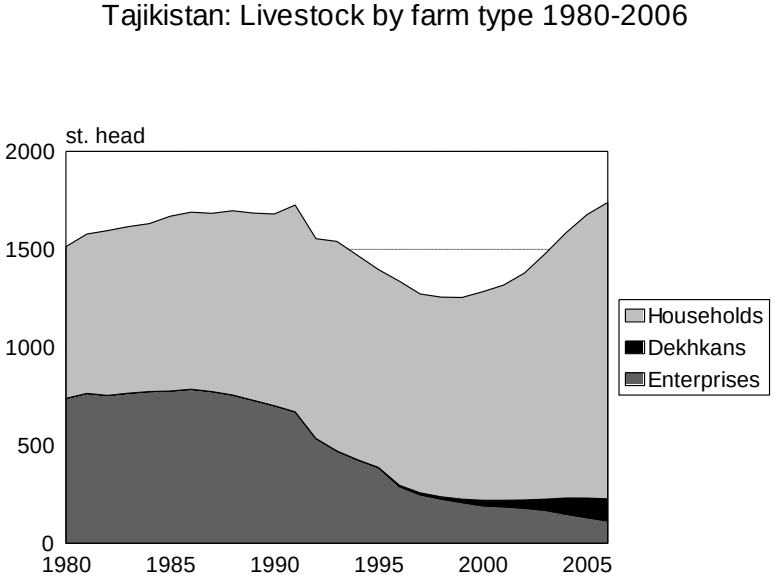


Figure 11.

The dramatic increase in the share of individual farms in land use and in livestock may have contributed to the overall growth in agricultural labor, which was previously observed to exceed the growth in the rural population (**Figure 5**). Individual farms act as a "labor sink", attracting relatively more labor than corporate farms. The growth of the individual sector may thus account for at least part of the growth in agricultural labor. Proper regression analysis should be carried out to check this conjecture.

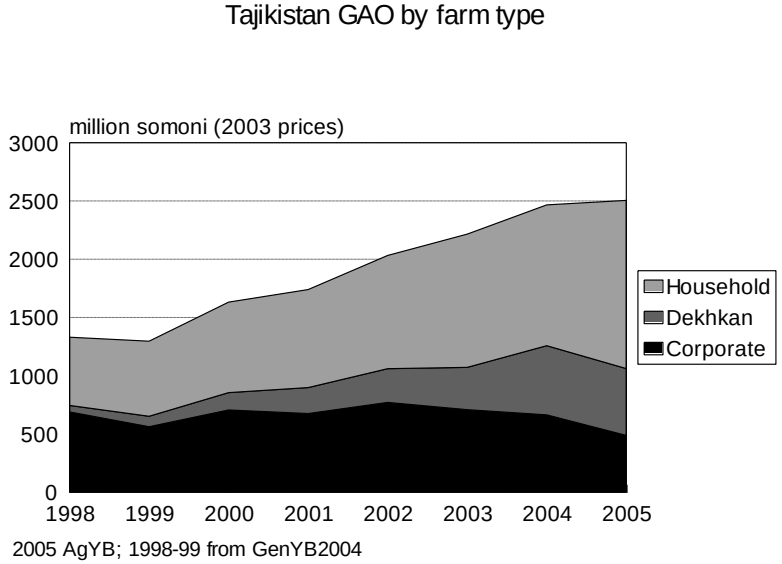


Figure 12.

The increase of land and livestock in the individual sector after 1995 is also linked to the recovery of agricultural production. **Figure 12** clearly shows that the growth of agricultural output since 1998 is directly attributable to growth in the individual sector – household plots and dekhkan farms (the two top gray layers in the diagram), while the corporate sector continued its general decline (the bottom black layer in the diagram). The link between individualization of farming and agricultural growth has already been demonstrated for several countries in CIS. We can attempt to verify this link more rigorously by estimating production functions from time series of farm inputs and outputs.

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