

6. FARM PROFILES

6.1 Farm Size and Land Development

The total area of all sample farms was varying during survey period due to variation in the number of survey farms. In 1996 their number was 36 with the total area 311,859ha and the total irrigated area 121,397ha, in 1997 the number of sample farms was 22 with the total area 169,964ha and the gross/net irrigated area 84,040/67,635ha, in 1998 the number of sample farms was 24 with the total area 161,234ha and the gross/net irrigated area 86,678/65,072ha.

Average farm areas by republics for different years are shown in Table 6.1.

	1996	1997	1998	
			Farms	Private Farms
Total Farm Area (ha)	11283.5	9526.8	12402	52.56
Irrigated area (ha)				
Gross		4648.8	4943	
Net	5312.0	3042.5	2444	52.56
Land Development Ratio		0.49	0.40	
Irrigated Landuse Ratio		0.65	0.49	
Number of Farms	4	5	2	24
Kyrgyzstan				
	1996	1997	1998	
Total Farm Area (ha)	11082.3	11121.0	11121.0	
Irrigated area (ha)				
Gross		2837.5	2837.5	
Net	2641.3	2680.0	2355.8	
Land Development Ratio		0.26	0.26	
Irrigated Landuse Ratio		0.94	0.83	
Number of Farms	4	4	4	
Tadjikistan				
	1996	1997	1998	
Total Farm Area (ha)	4737.0	4150.5	4150.5	
Irrigated area (ha)				
Gross		2344.0	2393.5	
Net	3105.0	2140.0	2140.0	
Land Development Ratio		0.56	0.58	
Irrigated Landuse Ratio		0.91	0.89	
Number of Farms	1	2	2	
Turkmenistan				
	1996	1997	1998	
Total Farm Area (ha)	4077.7	4408.5	4437.5	
Irrigated area (ha)				
Gross	4079.5	4079.5	4180.5	
Net	2966.7	3169.5	3270.5	
Land Development Ratio	1.00	0.93	0.94	
Irrigated Landuse Ratio	0.73	0.78	0.78	
Number of Farms	2	2	2	
Uzbekistan				
	1996	1997	1998	
Total Farm Area (ha)	6053.2	6935.1	4484.5	
Irrigated area (ha)				
Gross	2304.0	4631.1	3222.8	
Net	3187.6	3387.1	2427.0	
Land Development Ratio	0.38	0.67	0.72	
Irrigated Landuse Ratio	1.38	0.73	0.75	
Number of Farms	12	12	16	

Unirrigated land of farms in Kazakhstan and Kyrgyzstan that have low land development ratio (around 0.25 – 0.40 in 1998), is used as pasture and for rainfed crops.

Privatization of land resulted in a decrease in irrigated area of former kolkhozes and sovkhoses. On the other hand the private farms have mainly irrigated arable land and land use ratio is practically 100 percent.

6.2. Cropping Pattern

The cropping pattern reflects both nature-climatic and socio-economic conditions of the region.

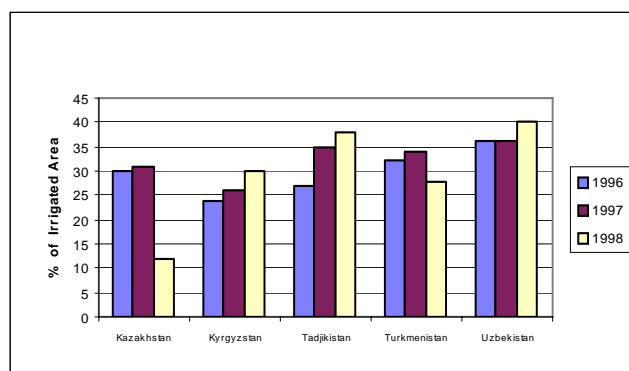
Cotton is the main crop in the region and covers 30-40 percent of the total irrigated land. This can be explained by the system of integrated agriculture developed during Soviet period. Now the cropping pattern depends on current conditions, such as:

- existence of state order for cotton and wheat;
- real benefit;
- self-sufficiency in grain;
- possibilities for marketing of agricultural production.

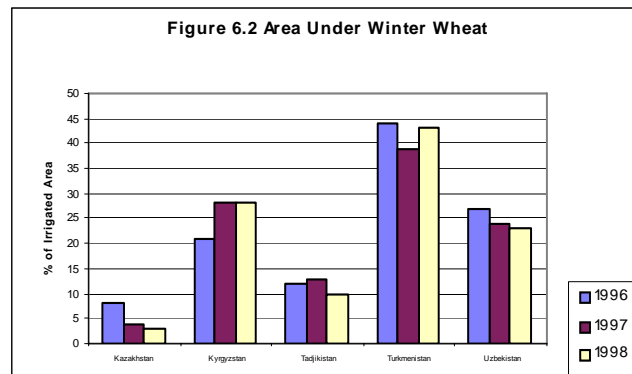
These conditions are quite different in each republic and define the cropping pattern (see Annex 1 and Figure 6.1).

Due to state order, area under upland cotton is quite big in Uzbekistan and Turkmenistan, 36-40 and 28-34 percent of total crop area accordingly (data for 1996-1998). In Tadjikistan area under cotton is markedly increased during survey period, from 27 percent in 1996 up to 38 percent in 1998 (Figure 6.1). According to estimation cotton is profitable crop in all sample farms of those three republics. In Kyrgyzstan area under cotton was increase from 24 to 30 percent during this period. This can be explained by high demand for cotton and existence of free market conditions, although high stable benefit is not achievable in all rayons. On the contrary, in Kazakhstan area under cotton was sharply decreased from 30 percent (1996) and 31 percent (1997) to 12 percent in 1998.

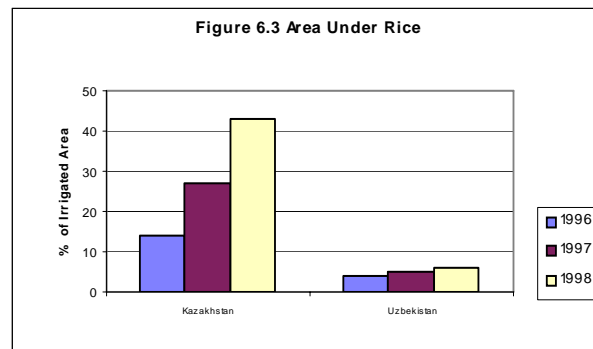
Figure 6.1 Area Under Cotton



The drive for self-sufficiency in grain in some republics is the reason for the big area under cereals. In 1996-1998 area under winter wheat was 21-22 percent of total crop area in the Central Asian region. In 1996-1998 the biggest area under this crop was in Turkmenistan (39-44 percent), the least was in Kazakhstan (3-8 percent). In some republics there are trends towards decrease of area under winter wheat (see Figure 6.2). For example, in Uzbekistan area under this crop has reduced from 27 percent in 1996 to 23 percent in 1998, in Tadjikistan from 12 to 10 percent, in Kazakhstan from 8 to 3 percent of total area under crops. Such trends are understandable taking into account the unprofitability of wheat production in those republics. At the same time area under winter wheat was increased in Kyrgyzstan, from 21 percent of total irrigated land in 1996 to 28 percent in 1997-1998.



There is significant increase of area under rice in Kazakhstan, from 14 percent in 1996 to 43 percent in 1998 (see Figure 6.3). Rice is a highly favoured crop for the Aral Sea littoral zone with shallow saline ground water table. For example, area under rice in 1996 was 14 percent of total irrigated land, in 1997 27 percent, in 1998 43 percent. The main incentives for rice production are its high farmgate price and ease of marketing.



It is necessary to note that area under forage crops is small: in Tajikistan 5-6 percent, in Uzbekistan 6-8 percent and in Turkmenistan 7-12 percent. This can be explained by sharp reduction of the national herds and flocks and decline of scientifically justified crop rotation. Refusal from crop rotation can cause reduction of land productivity in the nearest future. Crop rotation in Kazakhstan is an example of proper land use. Area under forage crops here has increased from 30 percent in 1996 up to 36 percent in 1998. Details on cropping pattern by republics in 1996-1998 see Annex 1.3.1.

6.3. Labour Resources

The employment pattern on the survey farms are shown in Table 6.2. The main categories of employees are labourers (81 percent), mechanics and drivers (7 percent) and management staff and brigadiers (3 percent). In 1998 the average sample farm employed 6034 men and women on a permanent basis and 541 seasonal employees. Variation in number of employees can be explained by privatization. This is the reason for significant reduction of number of labourers in sample farms. For example in Kazakhstan the average sample farm employed 1319 labourers. With the beginning of privatization and creation of private farms in 1998 the number of labourers has reduced down to 681. After almost complete fragmentation and creation of small private farms the number of labourers reduced down to 47 labourers per farm in 1999. As a result of privatization farm machinery was distributed between private farmers. This caused the reduction of number of mechanics and drivers, because private farmer himself can drive his tractor. Naturally load per private farm's labourer (ha) is increasing. Similar situation can be observed in Turkmenistan, where in 1998 self-sustained brigades and tractor/machinery pools were created and this caused the increase of load per tractor and per driver. The process of privatization is going slowly in

Tadjikistan and Uzbekistan, the private farms (shirkats, brigades) operates within state owned economic environment. Despite complete fragmentation of state farms in Kyrgyzstan from legal point of view, in fact they exist as new farmers associations with common machinery pool. So there is no significant changes in employment pattern within the farms in those republics.

Table 6.2 shows the area of irrigated crop per employee in each category. Overall levels of employment per farm and per hectare are quite high by international standards. They reflect the strategy of agricultural development in CAR. Besides, this situation can be explained by the absence of alternative economic activities in rural communities and historical tradition of local population to live close to his parents place.

6.4. Crop Husbandry

Crop husbandry issues are discussed in details in Chapter 8. This chapter provides data on the use of agrochemicals by the whole farm.

The main fertilisers used in the farms were ammonium nitrate, ammonium sulphate and single superphosphate. More wide range of fertilisers was available for use on farms in Uzbekistan. In addition it was used amofos, nitroamophos, nitrophoska. Data in Table 6.3 show that the main plant nutrient in all republics was nitrogen.

During all survey period only nitrogen fertilisers were used in Turkmenistan and Kyrgyzstan. Of total fertilisers applied in the other republics 85-95 percent were nitrogen and 15-5 percent phosphorus fertilisers. This pattern was practically the same by all years of observations. Potassium fertilisers were applied in Uzbekistan only with 2, 4 and 6 percent of total amount by years of observations 1996, 1997 and 1998 accordingly.

Monitoring has revealed the problems with plant protection system. The sample farms had no enough supply of pesticides and biological control agents (only 10-12 percent), herbicides (25-30 percent), insecticides (60-70 percent) of quantity applied for. The main chemicals used in sample farms were BI-58, Decis, Talstar, Arrevo, Basargan, Landox, Granstar.

In the condition of privatization and creation of private farms the plant protection service should be retained, probably in the form of consulting centres. Most of farmer have little knowledge in this area. During monitoring the use of ineffective chemical for the specific case was recorded as well as procurement of chemicals with expired date of use, thus increasing the cost of production.

Table 6.2 Employment Patterns on Farms																				
Republics	Kazakhstan				Kyrgyzstan				Tadjikistan				Turkmenistan				Uzbekistan			
Categories	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999
<i>Average employees per farm</i>																				
Management staff	60	45	2	2	39	39	38	30	65	50	54	67	35	48	8	10	31	29	22	28
Brigadiers	22	18	2		20	22	20	31	26	15	15	23	17	22	12	14	42	39	25	27
Drivers	47	25	6		40	36	37	35	57	36	31	38	25	28	5	4	30	21	24	24
Other	281	0			15	30	30		0		94		37	48	16	27	13	91	58	
Labourers	1319	681	47	9	1831	1463	1469	3270	1312	1292	1393	1540	1018	1228	1172	1003	1064	983	833	835
Seasonal workers	215	559	0						38	0			526	0		0	741	546	541	477
Specialists		9	9			14	18	14			35				4	3		12	17	11
<i>Irrigated Crop Area per Employee (ha)</i>																				
Management staff	89	67	109	8	67	70	62	84	48	43	40	42	86	66	409	890	106	116	113	126
Brigadiers	239	230	286		130	125	119	81	119	143	143	122	183	147	284	636	79	86	128	132
Drivers	113	121	273		66	74	64	72	54	59	69	74	123	113	727	2225	111	161	133	150
Other	19				176	179	157				46		81	66	204	330	263	94	222	
Mechanics	124	24	46	15	36	36	32	50	19	24	25	27	49	63			26	29	30	31
Labourers	4	4	8	1	1	2	2	1	1	2	2	2	3	3	3	3	3	2	3	4
Seasonal workers	8	3							82				1				2	1	1	2
Specialists		716	666			766	135	180			122				818	2966		574	257	396

Table 6.3 Use of Different Fertilisers (percent of total fertiliser use)

Fertiliser	Kazakhstan				Kyrgyzstan				Tadjikistan				Turkmenistan				Uzbekistan			
	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999	1996	1997	1998	1999
Ammonium nitrate	15	22	28	100	55	97	100	100	33	85	79	85	100	100	100	54	47	45	49	13
Ammonium sulphate	80	57	72		45	3											16	10	8	11
Urea									67		1						9	12	20	13
Single Superphosphate	5	10								8	9					46	5	5	3	1
Double Superphosphate																	2	0		
Monoammonium phosphate (Amofos)										7	0	15					9	13	13	36
Diammonium phosphate											2						1	6	0	
Potassium chloride											9						0	1	1	1
Potassium sulphate																	0		1	1
Compound																	6	1		
Glukanat																	6	1	3	5
Nitroammophos		11																3	3	17
Nitrophoska																		2		

Positive experience of use of biological control agents should be orientated on the use of integrated pest management system and restoration of ecologically sustainable system of pests and diseases control. Mainly biological control agents were used in the sample farms of Kazakhstan and Uzbekistan with overall availability by the region 10-15 percent.

It is necessary to note that monitoring has revealed some misconduct of recommended crop operations. The main reasons for this are the following:

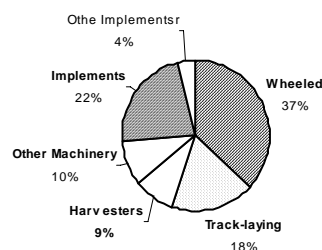
1. Lack of machinery and its poor technical condition that caused untimeliness of crop operations;
2. Improper use of imported machinery and lack of necessary training in its use led to the bad land preparation;
3. Problems with plant protection system: lack of pesticides and its poor quality led to pests outbreak;
4. Lack of necessary assortment of fertilizers;
5. Poor quality seeds.

6.5 Farm Machinery

Study of availability, technical condition and use of machinery in the sample farms was accomplished.

Average distribution of different type of machinery by the region is shown in Figure 6.4. In general 37 percent of all available farm machinery are wheeled tractors, 18 percent are track-laying tractors, 96 percent are harvesters and 22 percent are implements.

Figure 6.4 Distribution of Machinery by Types



The data on availability of operating machinery are shown in Table 6.4. The number of wheeled tractors is bigger than track-laying tractors in all republics. So this difference in the farms of Kyrgyzstan and Tadjikistan is threefold, that of in other republics is 1.5-2 times as much.

On average farms of Uzbekistan and Kyrgyzstan are better equipped with machinery as compared with other republics, but nonetheless the availability of operating machinery, wheeled tractors and harvesters in particular, is several times less than normative values, recommended by the ministries of agriculture during soviet times.

For example, according to the norms (see [WUFMAS Report, 1997](#)) 40 wheeled tractors, 25 track-laying tractors and 23 harvesters are required per 1000ha of cotton. Presently, the actual number of the above machinery per 1000ha of cotton is 8.7, 7.8 and 2.1 respectively, i.e. the availability and load per unit are close to the international standards. Trends in the availability of machinery by survey years are shown in Figures 6.5-6.7 (Annex I 6.2), where it is clear that there is no changes in the availability of machinery in Uzbekistan. The availability of wheeled tractors in the farms of Kyrgyzstan was improved, but the number of harvester went down. This can be explained by land privatization and sharp reduction of cotton harvesters use. Overall machinery supply in Tadjikistan and Turkmenistan is low and there is a trend of further reduction of number of machines. In the farms of Turkmenistan in 1998 the number of wheeled tractors was only 1.52 unit/1000ha, track-laying tractors 0.34 unit/1000ha, harvesters 0.34 unit/1000ha (see Table 6.4).

The rest of machinery was handed over to separate machinery pools and can be used by farmers on the lease basis.

Table 6.4 Availability of Machinery
(unit/1000ha)

	1996	1997	1998
Wheeled Tractors			
Kazakhstan	4.86	5.10	35.68
Kyrgyzstan	11.36	10.41	9.80
Tadjikistan	7.89	5.25	7.76
Turkmenistan	5.98	4.29	1.52
Uzbekistan	8.17	9.02	8.70
Track-laying Tractors			
Kazakhstan	3.41	3.68	31.01
Kyrgyzstan	4.21	4.74	4.29
Tadjikistan	2.42	3.90	2.31
Turkmenistan	3.10	1.28	0.34
Uzbekistan	4.52	3.95	7.82
Harvesters			
Kazakhstan	2.68	3.00	12.58
Kyrgyzstan	2.48	2.15	2.11
Tadjikistan	0.24	1.28	0.99
Turkmenistan	0.82	0.64	0.34
Uzbekistan	2.17	2.14	2.10

Shares of operating, repairable and derelict farm machinery are shown in Figures 6.8-6.12.

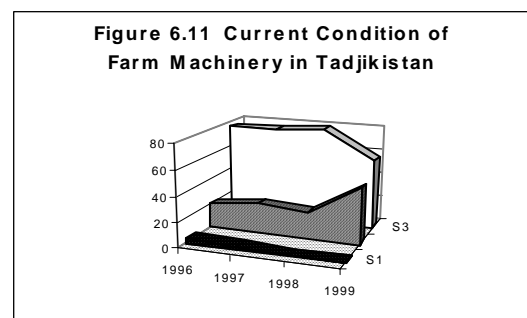
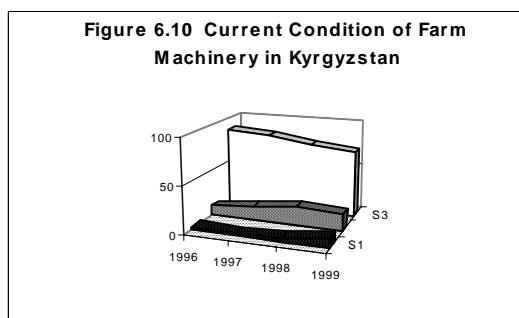
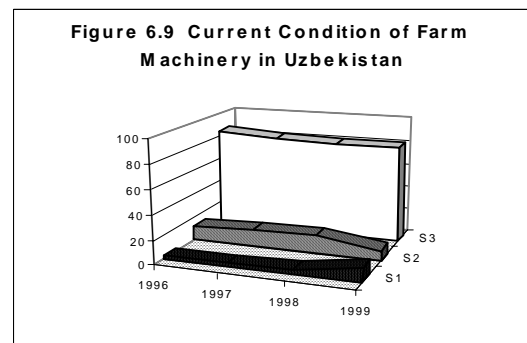
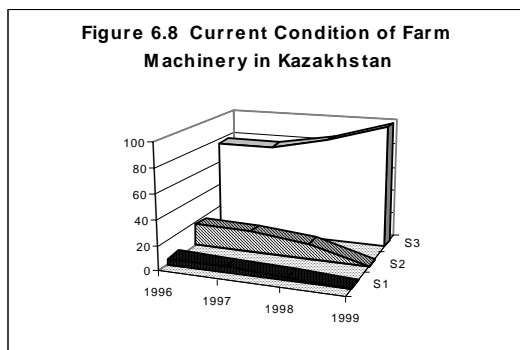
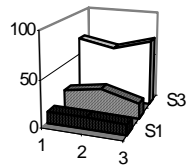


Figure 6.12 Current Condition of Farm Machinery in Turkmenistan



S 1 - derelict

S 2 - repairable

S 3 - operating

Number of derelict machinery was increased by 7 percent in the farms of Uzbekistan, but number of operating ones remains the same. Part of operating machinery (around 15 percent) has become non-operating, but repairable in Kyrgyzstan and Tadjikistan. In Kazakhstan the significant increase of number of machinery is related with survey farms privatization. While subdividing the availability of machinery was increased in those farms and it was reflected in the overall picture in the republic. But further special analysis of these trends in all republics is required.

6.6 Drainage System

All information on drainage system of sample farms was presented in WUFMAS Report 1997. The situation with drainage is still the same, so the drainage system is not discussed in this report.