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**Vulnerability to risk among small farmers in Tajikistan:  
results of a 2011 survey**

by

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# Vulnerability to risk among small farmers in Tajikistan: results of a 2011 survey<sup>1</sup>

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## Introduction

Tajikistan is judged to be highly vulnerable to risk, including food insecurity risks and climate change risks. By some vulnerability measures it is the most vulnerable among all 28 countries in the World Bank's Europe and Central Asia Region – ECA (World Bank 2009). The rural population, with its relatively high incidence of poverty, is particularly vulnerable. The Pilot Program for Climate Resilience (PPCR) in Tajikistan (2011) provided an opportunity to conduct a farm-level survey with the objective of assessing various dimensions of rural population's vulnerability to risk and their perception of constraints to farming operations and livelihoods. The survey should be accordingly referred to as the 2011 PPCR survey.

The rural population in Tajikistan is highly agrarian, with about 50% of family income deriving from agriculture (see **Figure 4.1**; also LSMS 2007 – own calculations). Tajikistan's agriculture basically consists of two groups of producers: small household plots – the successors of Soviet “private agriculture” – and dehkan (or “peasant”) farms – new family farming structures that began to be created under relevant legislation passed after 1992 (Lerman and Sedik, 2008). The household plots manage 20% of arable land and produce 65% of gross agricultural output (GAO). Dehkan farms manage 65% of arable land and produce close to 30% of GAO. The remaining 15% of arable land is held in agricultural enterprises – the rapidly shrinking sector of corporate farms that succeeded the Soviet kolkhozes and sovkhoses and today produces less than 10% of GAO (TajStat 2011)

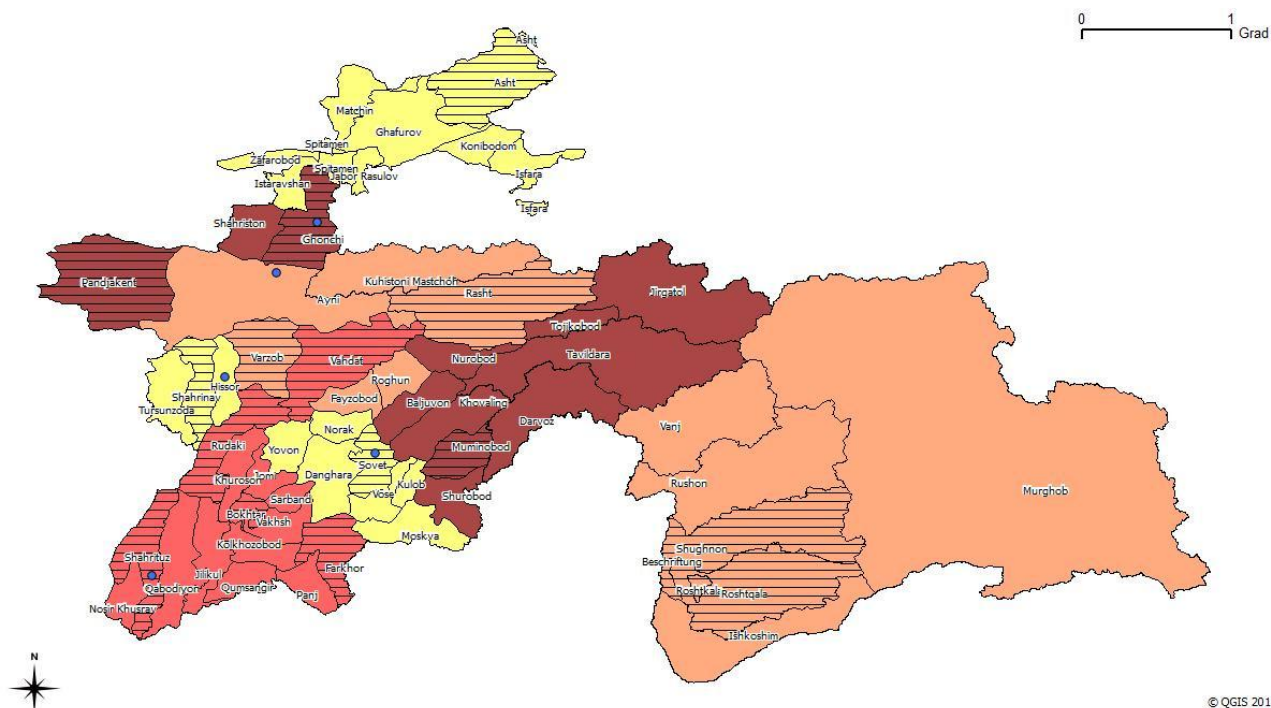
The survey conducted in May 2011 focused on dehkan farms, as budgetary constraints precluded the inclusion of household plots. A total of 142 dehkan farms were surveyed in face-to-face interviews. They were sampled from 17 districts across all four regions – Sughd, Khatlon, RRP, and GBAO. The districts were selected so as to represent different agro-climatic zones, different vulnerability zones (based on the World Bank (2011) vulnerability assessment), and different food-insecurity zones (based on WFP/IPC assessments). Within each district, 3-4 jamoats were chosen at random and 2-3 farms were selected in each jamoat from lists provided by jamoat administration so as to maximize the variability by farm characteristics. The sample design by region/district is presented in **Table A**, which also shows the agro-climatic zone and the food security phase for each district. The sample districts are superimposed on a map of food security phases based on IPC April 2011.

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<sup>1</sup> This article is based on research carried out as part of the Pilot Program for Climate Resilience (PPCR) in Tajikistan, Phase 1, Component A5, Agriculture and Sustainable Land Management (SLM), February-August 2011.

**Table A. Sample structure by oblast/rayon**

Oblast	Rayon	Number of interviews	Agro-climatic zones	Food security phases (IPC April 2011)
Khatlon	Bokhtar	8	6 (S lowlands)	2 – borderline
Khatlon	Kabodiyon	3	6 (S lowlands)	2 – borderline
Khatlon	Muminabad	8	8 (NE hills)	2 – borderline
Khatlon	Temurmalik (Sovetskii)	8	7 (SE hills)	3 – acute crisis
Khatlon	Farkhor	9	6 (S lowlands)	2 – borderline
Khatlon	Shaartuz	7	6 (S lowlands)	2 – borderline
<i>Total Khatlon</i>		43		
RRP West	Rasht	8	3 (RRP-Sughd)	4 – emergency
RRP East	Varzob	8	3 (RRP-Sughd)	2 – borderline
RRP East	Vahdat – mountains	8	5 (W hills)	2 – borderline
RRP East	Vahdat – lowland	8	5 (W hills)	2 – borderline
RRP East	Rudaki	8	5 (W hills)	2 – borderline
RRP East	Shahrinav	8	4 (W lowlands)	1 – food secure
<i>Total RRP</i>		48		
Sughd	Asht	9	1 (N lowlands)	3 – acute crisis
Sughd	Ghonchi	10	2 (S hills)	3 – acute crisis
Sughd	Penjikent	8	2 (S hills)	3 – acute crisis
<i>Total Sughd</i>		27		
GBAO	Roshtqala	11	10 (SW GBAO)	2 – borderline
GBAO	Shugnan	13	10 (SW GBAO)	2-- borderline
<i>Total GBAO</i>		24		
<b>Total sample</b>		142		



The sample included dehkan farms (DF) of different organizational forms: individual DF, single-family DF, DF based on an extended family, “collective” dehkan farms based on families without blood relations, and corporate farms (agricultural cooperatives and share companies). **Table B** shows the proportion of farms of different types in the sample. Given the sample selection process, these proportions are not representative of Tajikistan as a whole. The survey findings thus provide a descriptive picture of the situation in the districts surveyed and are not necessarily generalizable to the entire country.

**Table B. Farms of different types surveyed, by oblast (percent)**

	Tajikistan (n=142)	Khatlon (n=43)	RRP (n=48)	Sughd (n=27)	GBAO (n=24)
Individual DF	11	0	17	7	25
Single-family DF	40	42	44	37	33
Extended-family DF	24	23	23	19	33
Collective DF	17	16	12	33	8
Corporate farms	8	19	4	4	0

This paper presents a preliminary analysis of the information collected in structured face-to-face interviews with 142 respondents. The 16-page questionnaire contained 108 closed questions organized in nine thematic sections, with the respective findings organized below in 13 separate sections:

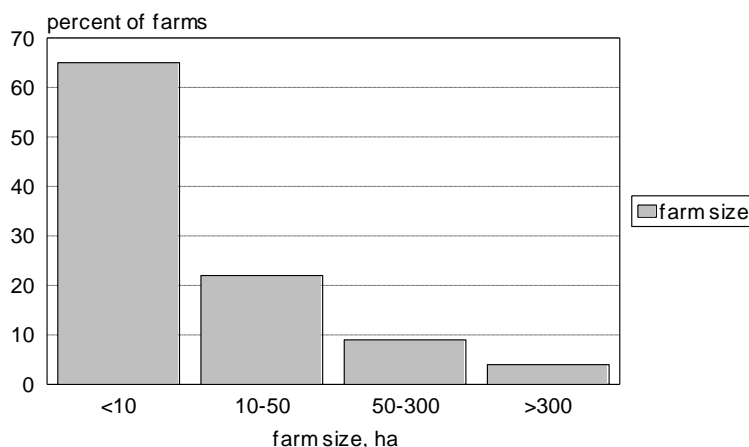
1. Land and income
2. Farm production
3. The household plot: livestock production and sales mix
4. Structure of family income
5. Family well-being and land
6. Land improvement measures
7. Cotton production and relations with investors
8. Debt and access to credit
9. Gender issues
10. Cooperation
11. Climate change and frequency of extreme events
12. Taxes, social benefits, insurance
13. Access to information and legal issues

All the results reported in what follows are based on the 2011 PPCR farm survey. Additional sources cited in the Introduction are listed under References at the end.

## 1. Land and income

Most farms in the survey are small, reinforcing the general impression of Tajikistan as smallholder agriculture. For 65% of the farms the size does not exceed 10 hectares (**Figure 1.1**), but there are a small number of farms ranging from 300 hectares to 3,000 hectares (less than 5% of the sample). The median farm size is just 6 hectares, but the mean size is 1,640 hectares – biased upward by the presence of a small number of large farms.

Taj survey (n=138): farm size distribution



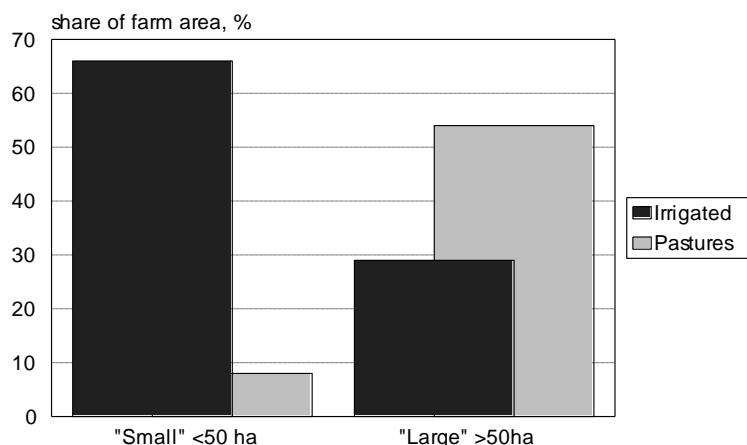
**Figure 1.1.**

**Table 1.1. Farm sizes and structure of land uses**

	All farms (n=138)	Size categories			
		<10 ha (n=90)	10-50 ha (n=30)	50-300 ha (n=12)	>300 ha (n=6)
Median size, ha	6	3	17	102	1,640
Average size, ha	92	3.9	21	133	1,691
Irrigated arable, %	62	69	57	29	28
Rainfed arable, %	14	13	20	12	11
Pastures, %	14	7	11	53	58
Perennials, %	7	9	6	4	1
Other, %	3	2	6	2	2

**Table 1.1** presents some results on farm sizes and structure of land uses. “Large” farms (from 50 ha to 3,000 ha) have a much larger share of pastures than “small” farms (up to 50 ha). “Small” farms, on the other hand, have a much larger share of irrigated arable land. The share of rainfed arable land is roughly constant at less than 15% across all size categories. **Figure 1.2** dichotomizes the land use structure for farms larger and smaller than 50 ha. The share of irrigated arable land is 66% in “small” farms and 29% in large farms; the share of pastures, on the other hand, is 8% in “small” farms and 54% in “large” farms. The difference in land use shares between “small” and “large” farms is statistically significant. It seems that farms “grow” primarily through addition of pastures.

### Structure of land use by farm size



**Figure 1.2.**

There is a distinct progression of size among farms of different organizational types: individual DF and single-family DF are the smallest (both by land area and by number of members), while collective DF and corporate farms are the largest. Dehkan farms created by groups of families linked by blood relations (“extended-family DF”) fall in the middle (**Table 1.2**).

**Table 1.2. Size progression among farms of different types (land area and number of members)**

	All farms	Individual DF	Single-family DF	Extended-family DF	“Collective” DF	Corporate farms
Total land, ha	92	6.7	8.0	56	191	510
Irrigated, ha	20	1.8	2.1	11	20	254
Rainfed, ha	11	0.5	2.1	12	37	18
Pastures, ha	54	0.4	3.3	30	110	326
Number of members	54	11	11	53	85	300

In most farms (85%) all land is contributed by members. Some lease part of their land from other dehkan farms or private landowners (6%) while the remainder (9%) either have land from other sources (such as the state land reserve) or do not know what the source of their land is. There are no notable differences in land sources across farms of different types.

Fragmentation of holdings does not appear to be a major issue. The respondent’s personal plot is divided into 2-3 parcels (2.2 parcels in family-based farms, 3.1 parcels in collective DF and corporate farms). The average distance to the farthest parcel is 2.9 km (2.2 km in family-based farms and 5.2 km in collective and corporate farms).

Farm management practices suggest that farms today are free from outside interference in their production and planting decisions. More than 85% of respondents indicate that the head of the farm or the farm members jointly decide what crops to grow and how much land to allocate to each crop; in another 10% of farms the decisions are made by the general assembly of farm members (**Table 1.3**). The role of the authorities (jamoat or hukumat) and the cotton investors is marginal among the farms surveyed. There are notable differences in decision making patterns between the category of individual and family farms on the one hand and the collective and corporate farms on the other

hand. In collective and corporate farms the decision-making process as reported appears to be quite democratic: 50% of farms report joint decision by member and 25% report decision by the general assembly of farm members. The head of farm does not appear to hold the autocratic role that anecdotal evidence assigns to the manager. In individual and family farms, on the other hand, the head of farm, who is also the head of family, plays a much more important role: the production and planting decisions are made by the head of farm (head of family) in 45% of farms in this category and another 48% report joint decision by members; the institution of the general assembly of farm members does not exist in family-based farms.

**Table 1.3. Who decides what to grow and how much land to allocate to each crop? (percent of respondents)**

	All farms (n=142)	Family-based farms (n=107)	Collective and corporate (n=35)
Head of farm (head of family)	37	44	17
Members jointly	49	48	51
General assembly of members	9	4	26
Outside agencies	4	3	6

There are pronounced differences in the procedure for distribution of output in farms of different types (**Table 1.4**). In family-based farms the entire output generally belongs to the family. In collective and corporate farms, on the other hand, the prevailing practice is allocation based on the family's share in the farm or, alternatively, allocation by the decision of the general assembly. The role of the head of farm in distribution decisions is limited and is essentially the same in farms of different types. It is noteworthy that, contrary to widespread anecdotal evidence, the practice of paying just a salary to members (without any output sharing) is highly limited.

**Table 1.4. Distribution of output in surveyed farms (percent of respondents)**

	All farms (n=142)	Family-based farms (n=107)	Collective and corporate (n=35)
Entire farm output belongs to the family	39	50	6
Family entitled to output from its membership share	27	20	49
Receive only salary	4	4	3
Head of farm decides on distribution	17	18	14
General assembly decides on distribution	11	6	29

## 2. Farm production

The farms surveyed are heavily biased toward crop production. Fully 97% of respondents report that they produce crops; among these 10% produce also fruits from perennial orchards. Farms producing fruits have more land in perennials than the rest: 6 hectares compared with 1 hectare, or 29% of total farm area compared with just 5%. Livestock production is much less widespread than crop production (27% of respondents). Among farms reporting livestock production, virtually all produce also crops or fruits: only 2 farms of 142 surveyed (one in Varzob, RRP and one in Roshtqala, GBAO) report livestock production without any crops. Processing of farm products is totally neglected, with only 4% of respondents engaged in this activity.

Farmers were asked to estimate the share of each farming activity in their total production (**Figure 2.1**). Here again plant enterprises are clear leaders: 88% of production from crops and another 3% from fruits. Livestock accounts for less than 7% of production; processing less than 2%.

There is no distinct pattern of production specialization by farm type. Thus, livestock is produced in 25%-30% of farms of different types, slightly fluctuating around the sample mean of 27%.

### Structure of farm production (n=123)

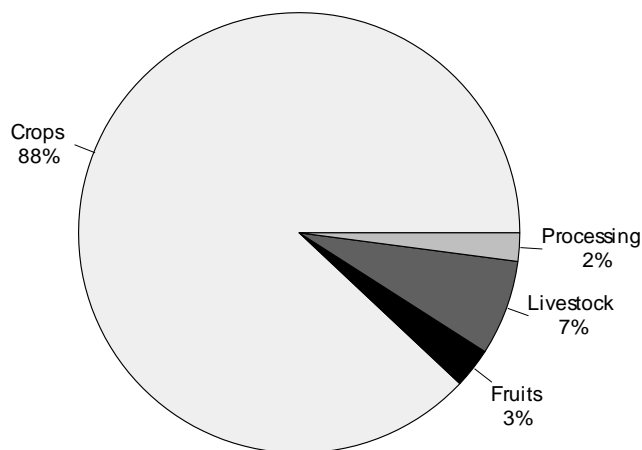


Figure 2.1.

How are the mixed farms producing both crops and livestock different from farms that produce only crops? The first difference is in the share of pastures: farms reporting livestock production have a higher share of their land in pastures and a lower share in irrigated arable land (**Table 2.1**). This differential persists in farms of all types. Second, livestock-producing farms are larger than farms that produce only crops (139 hectares compared with 69 hectares). This is consistent with the previous observations that more pastures typically implies larger farms. Third, livestock-producing farms have more members than crop-specialized farms (102 members per farm compared with only 36 members in farms that do not have livestock production). This is consistent with the general fact that livestock is a labor-intensive industry that requires more working hands.

**Table 2.1. Comparison of mixed crop-livestock farms with crop-specialized farms**

	Mixed farms (n=39)	Crop-specialized farms (n=103)	All farms (n=142)
Land area, ha	139	69	92
Share of pastures, %	29	7	13
Share of irrigated arable land, %	56	64	62
Number of members	102	36	54
Mean share of livestock in production, %	34	0	7

### 3. The household plot: livestock production and sales mix

Contrary to dehkan farms, the operations on the household plot appear to be biased toward livestock more than crops. Only 27% of dehkan farms have livestock operations; among household plots, on the other hand, fully 92% keep livestock. Virtually all of these household plots (98%) have cattle: 4 cows and 1 bull on average. In addition, there are 16 sheep and 6 chickens on average. Sheep are kept by less than 50% of households and poultry is curiously reported by a mere 20%. The households that keep sheep (48% of the sample) have more sheep per household than the average for all households with animals (31 sheep compared with 16), but the difference is not statistically



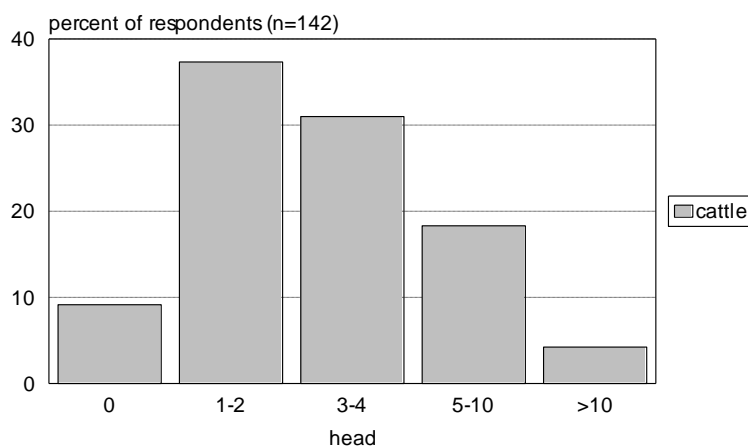
significant. The number of cattle, on the other, does not differ much between the two categories of households. As a result, the total herd is practically the same – about 7 standard head in both categories (**Table 3.1**; standard head are calculated by taking 10 sheep or goats and 100 birds equivalent to one head of cattle). Poultry, for some reason, is of marginal importance in all households. In households that actually report poultry, the average number of birds is 30 (compared with the sample mean of 6), which is quite low.

**Table 3.1. Animal headcount in households**

	All households with animals (n=131)		Households with sheep (n=68)	
	Mean, head	Median, head	Mean, head	Median, head
Bulls	1		1	
Cows	4		3	
Cattle	5	3	4	4
Sheep and goats	16	3	31	10
Chickens	6	0	10	0
All animals, st. head	6.7	4	7.5	5

The distribution of cattle (cows and bulls) and sheep and goats is shown in **Figures 3.1 and 3.2**. Less than 10% of households in the survey are without any cattle and 37% have one or two animals. On the face of it, close to 50% of households fall in the category that WFP classifies as “vulnerable” by animal headcount. This, however, is a very restrictive view of vulnerability, as it looks at a single endowment – cattle, and furthermore focuses on the household plot, ignoring the dehkan farm that may exist over the family holdings. Overall, 68% of households have between 1 and 4 head of cattle. The median headcount is 3 (compared with mean 5). Sheep and goats are kept in 48% of households only (all of these also have cattle). The median headcount is 10 sheep (compared with mean 30), with 57% of households reporting between 5 and 20 sheep.

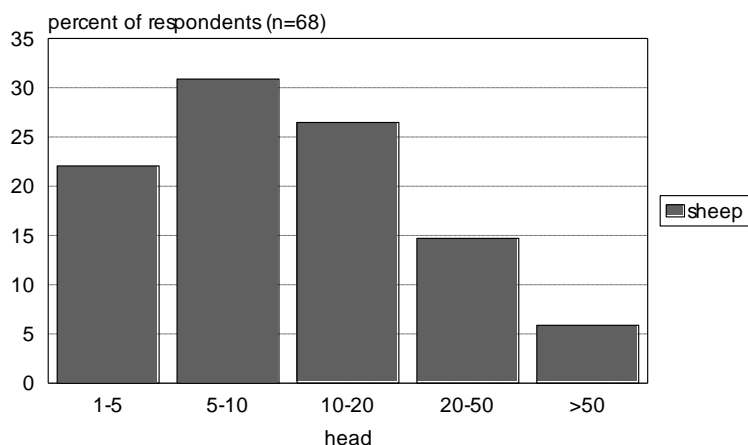
**Distribution of cattle headcount in households**



**Figure 3.1.**

Based on full sample of n=142

## Distribution of sheep and goats in households



**Figure 3.2.**

Based on 68 households (48%) reporting sheep or goats

Livestock sales represent 56% of total sales revenue from household plots, most of it from sale of live animals. Dehkan farm sales, on the other hand, are mostly crops, with livestock accounting for less than 10% of total sales revenue. Two additional notable differences between sales of dehkan farms and household plots concern cotton and fruits: household plots neither produce nor sell cotton, while in dehkan farms cotton accounts for 36% of sales revenue; fruits represent 17% of sales revenue from household plots and only 5% in dehkan farms (**Table 3.2**).

**Table 3.2. Structure of sales revenue in dehkan farms and household plots (percent)**

	Dehkan farms (n=104)	Household plots (n=57)
Cotton	36	0
Cereals	21	10
Potatoes and vegetables	30	15
Fruits	5	17
Milk	3	20
Animals	5	36
Meat	0.1	1.5

About half the households with livestock report sale of live animals. During the year, these households sell more than half their cattle inventory (4 head of cattle out of total 7) and one-third of their flock of sheep (8 sheep out of total 23). The average revenue from the sale of live animals was 3,500 somoni in 2010 (for the 60 households reporting such sales). The price per animal estimated from the survey is shown in **Table 3.3**.

**Table 3.3. Average price per animal sold (somoni)**

	Number of farms reporting full sales data (out of n=131 with livestock)	Average price per animal sold, somoni
Bulls	24	2,200
Cows	21	1,700
Sheep	22	330

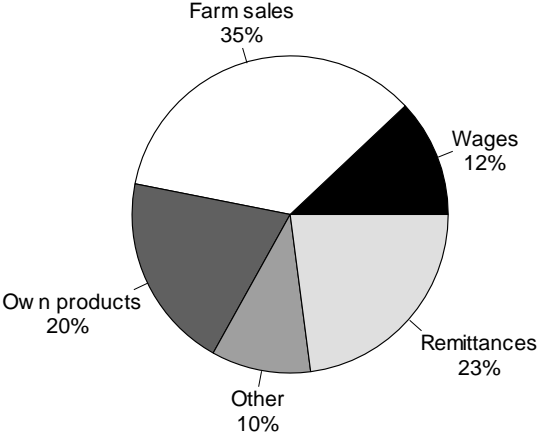
Nearly 50% of households graze their animals on jamoat’s communal pastures and another 30% graze them on dehkan farm pastures. Of the remaining 20%, most report feeding their animals “at home”, in the barn, and only 5% send their animals to graze on road verges and field stubble. Virtually all households that use communal pastures pay for grazing: the payment is 20 somoni per head of cattle and 6 somoni per sheep or goat (presumably for the entire season). The payment to dehkan farm for use of its pastures is higher (46 somoni per head of cattle, 23 somoni per head of small ruminant), but the number of responses in this category is very small, involving large errors in estimates.

Veterinary services are used universally (by 95% of households with animals). The respondents are divided evenly between state and private veterinary services. Payment for veterinary services is also universal: 95% of respondents pay regardless of whether they use state or private services. State veterinary services charge less than private services: 15 somoni per head in state services compared with 25 somoni to a private veterinarian (the difference is statistically significant at  $p=0.1$ ).

**4. Structure of family income**

More than half the family income derives from agriculture (sales and consumption of own farm products; see **Figure 4.1**). Remittances are the second most important source, contributing 23% of total income. Wages from off-farm sources contribute 12% and the remaining 10% is from pensions (5%) and non-agricultural business activities (5%). The respondents estimate that income from the household plot (in cash and in kind) constitutes about one-quarter of family income.

Structure of family income (n=134)



**Figure 4.1.**

There is considerable variability in the structure of income source across oblasts (**Table 4.1**). In GBAO income from agriculture (17%) is much lower than the average in the survey while the share of remittances is much higher than the average (50%). Since GBAO is over-represented in the sample (21 out of 134 observations, or 16% of the farms surveyed compared with just 3% of the population), its low share of agricultural income and exceptionally high share of remittances bias the overall survey means. Without GBAO, the mean share of agricultural income rises to 62% and the mean share of remittances drops to 18%.

**Table 4.1. Structure of family income (percent of total income)**

	Tajikistan (n=134)	GBAO	Sughd	RRP	Khaton	Without GBAO
Wages	12	9	12	15	10	12
Income from agriculture	55	17	51	72	58	62
Pensions	5	15	1	3	5	4
Remittances	23	50	31	8	22	18
Other income	5	9	5	2	5	4
Total	100	100	100	100	100	100

There are noticeable differences in income structure as a function of farm size (**Table 4.2**). Remittances are less important for relatively large farms: the share of remittances decreases from 24% in “small” farms with up to 50 hectares to 17% in farms larger than 50 hectares. Large farms earn a greater share of their income from agriculture (66% compared with 54% for small farms).

**Table 4.2. Structure of family income for “small” and “large” farms (percent of total income)**

	All farms (n=130)	“Small” <50 ha (n=113)	“Large” >50 ha (n=17)
Off-farm wages	12	12	11
Farm sales	35	34	43
Consumption of farm products	20	20	23
Business activities	4	4	4
Pensions	5	6	2
Remittances	23	24	17

A slightly different view of income sources is based on the perceived importance of agriculture in family income as reported by respondents according to a three-level classification: agriculture is the only income source (25% of respondents); agriculture is the main income source, but there are other sources also (52%); agriculture is not the main income source: there are other more important sources (17%). The majority of respondents thus paint a picture of diversified income sources, with agriculture as the main income-generating activity supplemented by other activities. This is consistent with the quantitative structure of income sources shown in figure and table above.

In a regional perspective (**Table 4.3**), the frequency of respondents reporting agriculture as the only income is constant across the four oblasts (25%). However, the frequency of respondents reporting that non-agriculture income plays a more important role than agriculture is dramatically higher in GBAO: 46% of respondents compared with 11% in other three oblasts. Correspondingly, GBAO is characterized by a much lower frequency of respondents who rely on a diversified income portfolio with agriculture supplemented by other activities (12% compared with 60% in other three oblasts).

**Table 4.3. Perceived importance of income-generating activities (percent of respondents)**

	Tajikistan (n=142)	GBAO (n=24)	Other three oblasts (n=118)
Agriculture is the only income source	25	25	25
Agriculture is the main source supplemented by other sources	52	17	59
Non-agricultural sources more important	17	46	11
No answer	6	12	4

**Table 4.4** shows that respondents reporting agriculture as their only income source have the largest farms (over 200 ha on average) and indeed the highest share of agriculture in their family income. However, agriculture is important across all families in the sample: it accounts for more than 20% of family income even for respondents who indicate that they rely mainly on non-agricultural sources. The share of remittances is low for families with large farms that rely mainly on agriculture for their income (9% of family income). It is correspondingly high (over 50% of family income) for families with relatively small farms whose income is derived mainly from non-agricultural sources.

**Table 4.4. Farm size and structure of family income for groups with different portfolios of income generating activities**

	Agriculture only source	Diversified agriculture and other sources	Mainly non-agricultural sources
Off-farm wages, %	10	13	9
Agriculture (sales and consumption), %	77	59	23
Business and pensions, %	4	8	16
Remittances, %	9	20	52
Mean farm size, ha	207	70	16
Median farm size, ha	7.5	5.8	3.0

## 5. Family well-being and land

Although the survey does not provide the absolute level of family income in somoni, it contains three relative well-being indicators: how do you compare your situation to the rest of the village (q103), what does your family budget buy (q105), and are you optimistic about the future (q104). Because of the small number of cases, these three indicators were transformed by dichotomizing the multiple-value answers into binary values: “better than the village average” versus “not better”; “budget allows a comfortable consumption regime” versus “the budget buys food and daily needs only”; “respondent optimistic about the future” versus “not optimistic”. The average farm size and the income structure were then estimated from the survey for each of the binary categories. The results are quite striking: all “better” well-being categories have more land than the other categories. Furthermore, in “better” well-being categories we have a significantly higher share of income from agricultural sales and a significantly lower share of income from remittances; in “poorer” well-being categories the share of income from agricultural sales is lower (less land!) and the share of remittances is higher. **Table 5.1** presents an illustration of these findings.

**Table 5.1. Farm size and income structure for various well-being categories**

	Comparison to village average (q103)		What the family can afford to buy (q105)		View of the future (q104)	
	Better than the village average	Not better	Comfortable consumption regime	Food and daily needs only	Optimistic	Not optimistic
	N=43	N=99	N=79	N=62	N=71	N=71
Mean farm size, ha	157	65	142	29	155	30
Income structure, %:						
Wages	15	10	12	12	12	12
Ag sales	<b>51</b>	<b>29</b>	<b>41</b>	<b>29</b>	<b>42</b>	<b>30</b>
Own products	10	24	19	21	20	19
Non-ag	8	10	8	11	7	12
Remittances	<b>18</b>	<b>26</b>	<b>20</b>	<b>29</b>	<b>19</b>	<b>29</b>

The observation that higher well-being is associated with more land is a new survey-based result for Tajikistan, although it has been previously established for other CIS countries. There is evidence for many CIS countries that more land in family farms and households translated into higher incomes and higher well-being. **Table 5.1** now shows that the same relationship between land and well-being (or income) is valid also for Tajikistan.

The finding concerning the share of income from agricultural sales (**Table 5.1**) provides a new proof of another land-related effect for Tajikistan: as we observe in other CIS countries, here also more land leads to a higher level of commercialization (more sales) and with it to a higher level of well-being. Thus, land has a two-fold effect: it directly increases income through production and it indirectly increases income by increasing sales, which in turn increase income.

**Figures 5.1 and 5.2** visualize the relationship between land and well-being and illustrate how the main components of family income differ for different levels of well-being.

Land endowment and well-being (n=142)

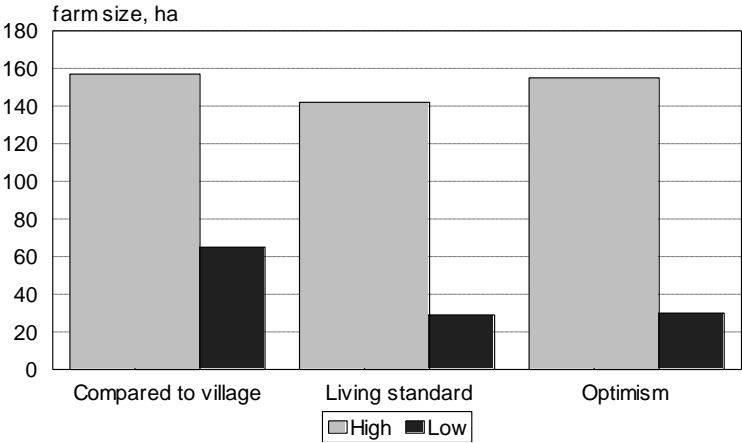


Figure 5.1.

Income structure and well-being levels

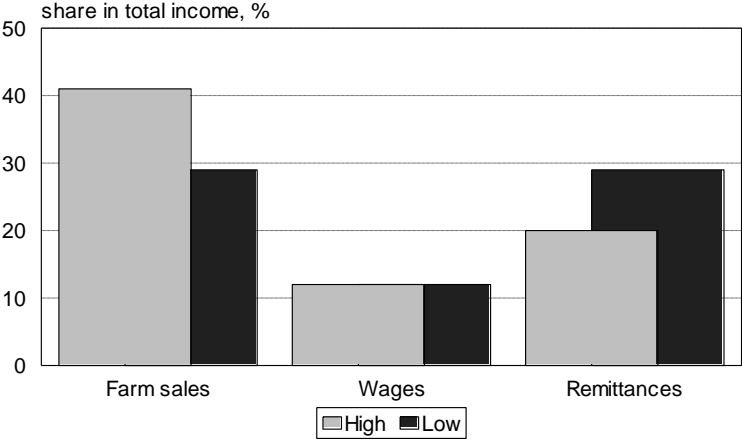


Figure 5.2.

Low: income sufficient to buy food; high: more comfortable consumption regime

## 6. Land improvement measures

Tajik farmers widely apply various measures for land improvement and prevention of soil degradation. Overall, more than 90% of farmers report using some from a range of 10 land-improvement measures. The usage frequency is significantly lower only in GBAO, where the number of respondents using land-improvement measures drops to 75% (**Table 6.1**).

**Table 6.1. Frequency of application of land improvement measures by oblast**

	Percent respondents (n=142)
Apply any measure	92
Khatlon	95
RRP	94
Sughd	100
GBAO	75

The most popular land improvement measures include attention to soil fertility by application of fertilizer and use of crop rotation (**Table 6.2**). These two techniques are actually combined in more than 50% of the cases, which implies that crop rotation – a natural fertility conserving measure – is virtually always used in conjunction with fertilizer application – an “industrial” agronomic measure. Another natural method to maintain soil fertility -- planting perennial grasses -- is also fairly popular, but in most cases it is used in combination with crop rotation, not as an independent measure. Maintenance and improvement of irrigation systems ranks third among the most widespread measures. The use of less conventional measures, such as agro-forestry techniques (shelterbelts between fields, conversion of arable land to orchards), terracing, and pasture fencing, is still marginal.

**Table 6.2. Record of land improvements: what land improvement measures have you applied? (percent of respondents)**

Measure	PPCR survey (n=142)	Helvetas survey, March 2011 (n=420)
Irrigation system improvement	36	47
Soil fertility (apply fertilizers)	87 (51% also crop rotation)	84
Crop rotation	55 (16% also grasses)	38
Sowing perennial grasses	19 (16% also crop rotation)	9 (2% with rotation)
Shelterbelts between fields	4	n.a.
Planting trees on arable land	3	9
Converting arable land to orchards	4	5
Terracing	0	2
Pasture fencing	5	0.5

**Table 6.3. Land-improvement techniques used by farms applying one measure and two-three measures (percent)**

	One measure (n=33)	Two-three measures (n=84)
Percent of all farms applying land-improvement measures	25	64
Fertilizer application	85	98
Crop rotation	9	72
Irrigation system improvement	6	42
Sowing perennial grasses		17

Most farms (64%) use 2-3 land improvement measures and only 25% report a single measure (**Table 6.3**). The single measure is basically application of fertilizer to improve soil fertility (85% of those using a single land-improvement measure), with crop rotation and irrigation system

improvement – the other two top-ranking techniques – mentioned by few respondents. Farms reporting 2-3 land improvement measures focus on the four top-ranking techniques – fertilizer application, crop rotation, irrigation system improvement, and sowing perennial grasses.

## 7. Cotton production and relations with investors

Only 25% of the surveyed farms grow cotton and less than half of them (12% of all farms) maintain relations with investors. There are no cotton growers among individual farms in the survey, but for all other farm types the percentage of cotton growers and the percentage of those using investors increases from one-family farms to corporate farms (**Table 7.1**).

**Table 7.1. Frequency of cotton growing farms and farms using investor services in the survey**

	All farms (n=142)	Individual (n=16)	One-family (n=57)	Extended- family (n=34)	Collective (n=24)	Corporate (n=11)
Grow cotton	25	0	12	32	42	64
Use investors	12	0	4	12	21	55

There is no other obvious characterization of farms that work with investors: farm sizes and the quantity of harvest are not significantly different between farms that use investor services and the rest.

Among those who use investor services 76% are satisfied with the timeliness of input deliveries but only 53% are satisfied with the prices that investors charge for inputs.

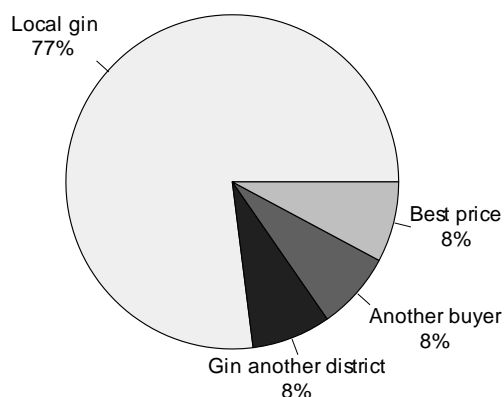
The relations with investors appear to be rigidly binding: among farms that work with investors 82% report that they are obliged to sell their cotton to the investor in return for inputs. Only 3 farms (18%) purchasing inputs from investors are free to sell their cotton elsewhere.

A total of 26 farms report selling their cotton to alternative buyers. These include 23 farms that do not work with investors and 3 farms that are not committed to sell to investors. Three-quarters of the “free” farms (20 farms) sell to the local ginnery (which is often controlled by the investor); the rest are equally divided between selling to a ginnery in another district, selling by contract to another buyer, and selling ad hoc to a buyer offering the best terms (just 2 respondents in each of the three groups). See **Figure 7.1**. Farmers who sell their cotton through alternative channels report higher satisfaction with prices received: the satisfaction rating is 58% for respondents who are “free” to sell to any buyer compared with 47% of those who sell to investors (the difference is not statistically significant).

A small number of farmers (12, or one-third of all cotton growers) indicate that ginneries in other districts may pay higher prices for cotton. However, half of these farmers report that investors block them from selling in other districts and another 20% say that the jamoat or the hukumat prohibit sales in another district. Finally, 20% say that it is too costly to transport the cotton to another district.



## Cotton sales to alternative buyers (n=26)



**Figure 7.1.**

Farms that do not use investors (or do not sell their cotton to investors) naturally have to look for alternative sources to finance their working capital need. However, even farms that maintain relations with investors sometimes resort to external financing, although to a smaller extent than farms not using investors (**Table 7.2**). Informal credit (borrowing from relatives, friends, and neighbors) is the most popular source of financing (36% of all cotton growing farms, 44% of farms that do not use investors). It is followed by own funds and formal borrowing from banks and microfinance institutions, which are reported by virtually the same percent of respondents.

**Table 7.2. Recourse to alternative financing sources for working capital**

	All cotton growing farms (n=42)	Farms that use investors (n=17)	Farms that do not use investors (n=25)
Credit from banks, micro-finance organizations	29	18	36
Informal credit (friends and relatives)	36	24	44
Own funds	31	6	40

## 8. Debt and access to credit

Only 16% of farms surveyed report that they carry debt. Of these, 39% inherited their debt during reorganization, while 48% indicate that this is new debt created by current operations. In 13% of farms the existing debt is a mixture of inherited and new (**Table 8.1**). Family-based farms have a lower frequency of debt (12%) than collective and corporate farms (29%; the difference is statistically significant). The origins of debt are also significantly different between family-based and collective farms: inherited debt accounts for 70% of total debt in collective and corporate farms compared with only 15% in family-based farms; new debt created by current operations is 30% in collective and corporate farms compared with 62% of total debt in family-based based (which also have 23% mixed inherited and new debt – not reported at all in collective and corporate farms).

Cotton growing contributes to debt accumulation: the frequency of debt among cotton growing farms is 20%, compared with 9% in farms that do not grow cotton.

For one-third of farmers the nearest financial institution is located in the village; for another 42% it is within 10 km from the village; the remaining 25% have to travel more than 10 km to get to a financial institution.

**Table 8.1. Farm debt (percent of respondents)**

	All farms	Family-based farms	Collective and corporate
Farms with debt (n=23)	16	12	29
Of these:			
Farms with inherited debt	39	15	70
Farms with new debt	48	62	30
Mixture of inherited and new	13	23	--

One-third of farmers indicate that they took a loan at some point in the past. The incidence of borrowing in family-based farms is significantly lower than in collective and corporate farms: 25% in individual, single-family, and extended-family farms compared with 57% in collective and corporate farms. The uses of these loans are presented in **Table 8.2**.

**Table 8.2. Borrowing and uses of credit (percent of respondents)**

	All farms	Family-based farms	Collective and corporate
Farms with debt	33	25	57
Of which for the following uses:			
Production costs	66	59	75
Purchase of animals	11	19	0
Purchase of machinery	13	11	15
Consumption	2	4	0
Education	11	15	5
Ceremonial	6	7	5
Other (migration, tax arrears)	4	4	5

There is a higher tendency among borrowers to take short-term loans than long-term loans. There is practically complete separation between short- and long-term borrowers in the survey, with only one respondent reporting both short- and long-term loans. Both the principal and the interest rate for short-term loans are smaller than for long-term loans (**Table 8.3**). The interest rate charged on loans is roughly double what the respondents perceive as an acceptable rate (11% per annum).

**Table 8.3. Credit terms reported by borrowers (averages for farms that borrow)**

	Frequency, % (out of n=47 borrowers)	Loan amount, somoni	Term	Annual interest rate
Short-term loans	57	9,300	7.5 months	19
Long-term loans	38	26,400	2.1 years	23

Collateral had to be provided by 75% of those who took loans. The different forms of collateral are listed in **Table 8.4**.

Only 15% of respondents complain of difficulties in receiving credit. For all of them complex procedure is the main complaint, although a small number of respondents also mention high interest rates and transportation costs. Among those who have never applied for credit (55% of respondents), 30% indicate that they do not need credit at all, 40% claim they are deterred by high interest rates, and 22% are put off by complex bank procedures.

**Table 8.4. Loan collateralization (percent of farms that borrow)**

	All farms that borrowed (n=47)	Family-based farms (n=27)	Collective and cooperative (n=20)
Provided collateral	75	78	70
Of which:			
Farm production	3	0	7
Livestock	29	29	29
House, farm buildings	60	48	79
Tractor, farm machinery	11	5	21
Car	20	24	14
Jewelry	3	0	7
Certificate of land use rights	11	19	0

### 9. Gender issues (based on n=132 cases with consistent numbers for men and women)

Overall, the number of women in surveyed farms is slightly higher than the number of men (**Table 9.1**). In individual and single-family dehkan farms, however, the situation is reversed: in these farms the number of men is higher than the number of women. It is only in multi-family farms (extended-family and collective dehkan farms) and corporate farms that we observe more women than men, presumably because of fewer internal constraints on the availability of migrant labor. The proportion of farms with a female head is fairly constant across different farm types at about 18%. It is slightly higher only in corporate farms, but this group is very small (total of 11 farms) and the result is statistically unreliable.

**Table 9.1. Gender composition of farm members**

	All farms (n=132)	Individual DF (n=14)	One family DF (n=56)	Extended family DF (n=33)	Collective DF (n=20)	Corporate (n=9)
Number of families	14	1.5	1.2	18	44	32
Members	34	2.0	5.5	53	87	63
Men	15	1.7	3.0	26	36	22
Women	19	1.2	2.5	27	51	41
Woman head	18%	19%	16%	18%	17%	28%

More than one-third of respondents report that women do not make any decisions on the farm (**Table 9.2**). This percentage of women without decision power is particularly high in individual DF (56%) and strikingly low in corporate farms (18%), where the proportion of female heads is relatively high. The main areas where women make decisions are land use planning (what and when to sow) and sale of farm products. In these areas again individual farms have very low women participation, while corporate farms allow much higher participation of women in decision making. Women make livestock decisions in 20% of all farms, but their share in farms that actually have livestock production is much higher (44% of livestock-producing farms). There seems to be a tangible link between women and livestock production in Tajikistan.

**Table 9.2. What farm decisions are generally made by women? (percent of respondents)**

	All farms (n=142)	Individual DF (n=16)	One family DF (n=57)	Extended family DF (n=34)	Collective DF (n=24)	Corporate (n=11)
Women do not make any decisions	35	56	39	26	33	18
Land use planning	45	12	44	53	46	73
Sale of farm products	34	12	30	35	42	64
Livestock management	20 (all farms) 44 (livestock farms)	25	21	21	12	19
What farming activities to adopt	14	12	16	9	8	36
Processing	14	12	7	24	17	18

Second row: q25\_1 plus cases with missing sum (no decisions across);

## 10. Cooperation

More than 50% of respondents cooperate with other farmers in various farming activities. Cooperation is reported across all farm types, ranging from a high of more than 60% for collective DF and corporate farms to a relative low of 47% for single-family farms (**Table 10.1**).

**Table 10.1. Cooperation rates across farms of different types (percent of respondents)**

	All farms (n=142)	Individual DF (n=16)	One-family DF (n=57)	Extended-family DF (n=34)	Collective DF (n=24)	Corporate (n=11)
Joint activities with other farmers	53	50	47	53	63	64
Membership in a formal association	44	57	42	53	37	18
DF association	25	44	25	29	17	9
Water users association	28	25	30	32	25	18

The most widespread area of cooperation is machinery pooling – joint use of farm machinery for cultivation and other purposes (48% of respondents; see **Figure 10.1**). Sharing of transport (for shipments to the market or for delivery of farm inputs) and cooperation in marketing or in input purchasing are each reported by more than 10% of respondents. Processing is the least popular activity for cooperation, reported by just 5% of respondents. Some respondents also mention cooperation in consulting and exchange of experience, but their number is very small (less than 2%), presumably because these options were not listed explicitly but left to the respondents discretion as part of the “other” category.

Most of the farms that report joint farming activities with others are also members of a formal association (75%). Membership in a formal association generally implies membership in a water users’ association (65% of association members), membership in an association of dehkan farms (58%), or membership in both (23%).

### Participation in joint farming activities (n=142)

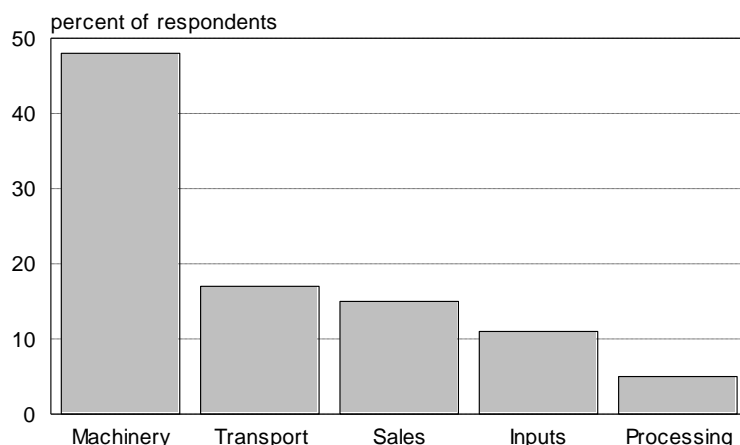


Figure 10.1.

The satisfaction rating of dehqan farm associations among their members is very low: 70% of respondents who are members in DF associations report that the association does not help at all (Figure 10.2). Some assistance is provided with machinery for field works and with seeds; assistance with sales, consulting, and training is reported very infrequently.

### Performance rating of dehqan associations by members (n=62)

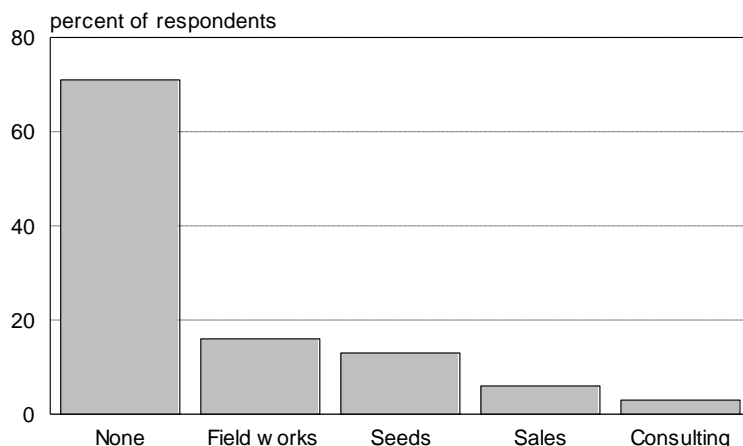


Figure 10.2.

## 11. Climate change and frequency of extreme events

Regarding climate change characteristics (Table 11.1), there is consensus on three attributes: the frequency of pests and plant diseases has increased, the vegetation period has become longer, and there is less precipitation and less snow cover. Consistently with the view of less precipitation, most respondents perceive a higher frequency of droughts and periods of excessive heat (Table 11.2). Strong winds and sandstorms are also perceived to have increased to a certain extent. The frequency of mudslides, floods, and frosts is generally not perceived as having increased. A surprising result in

**Table 11.2** is the general ignorance of the respondents as to the state of the glaciers: 74% have no opinion on the subject of glacier melting.

**Table 11.1. Climate change characteristics: last 10 years (percent of respondents)**

	Observed	Not observed	Not sure
Vegetation period: shorter	18	<b>25</b>	57
Vegetation period: longer	<b>37</b>	8	55
Precipitation: less	<b>68</b>	13	19
Precipitation: more	14	<b>44</b>	42
Snow cover: less	<b>67</b>	11	22
Snow cover: more	9	<b>44</b>	47
Penetration of saline water into the soil	20	22	<b>58</b>
Increased frequency of pests and plant diseases	<b>63</b>	8	29

**Table 11.2. Frequency of extreme events: last 10 years (percent of respondents, sorted by decreasing “confidence”)**

	Increased	Unchanged	Decreased	Not sure
Droughts	<b>78</b>	8	7	7
Periods of excessive heat	<b>58</b>	16	6	20
Strong rains	23	25	21	31
Strong winds	<b>35</b>	20	10	35
Strong snowfall	11	11	<b>41</b>	37
Periods of excessive cold	12	25	24	39
Mudslides	18	19	20	43
Strong hail	13	19	<b>25</b>	43
Floods	7	<b>25</b>	19	49
Strong sandstorms	<b>23</b>	9	7	61
Avalanches	10	6	11	73
Melting of glaciers	9	6	11	74

## 12. Taxes, social benefits, insurance

Practically every farm pays taxes, which is basically the unified tax (88% of respondents) and the social tax (77%). Many respondents (30%) report paying both the unified tax and the land tax (**Table 12.1**). In these cases the land tax presumably applies to the household plot (“presidential land”), not the dehkan farm, where land tax is incorporated in the unified tax. Local taxes – retail sales tax, transport tax, and property tax – are reported less frequently, with the retail sales tax at the top of the ranking with 42% of respondents.

**Table 12.1. Frequency of tax payers among the surveyed farms (percent of respondents)**

	All farms (n=142)	Family-based DF	Collective/corporate types
Pay taxes	88	86	94
Unified tax	88	86	94
Land tax	32	31	34
Social tax	77	72	91
Retail sales tax	42	37	57
Transport tax	15	10	31
Property tax	11	7	26

Overall, farms of different types show the same tax payment rate, with slightly higher payment rates among corporate farms (**Figure 12.1**). Significant differences are only observed in case of the social tax and local taxes: collective DF and corporate farms show a higher tendency to pay these taxes

than family-based DF. This proves again the common truth that it is easier to collect taxes from large formal organizations than from family farms.

Frequency of tax payments by farms of different types  
(n=142)

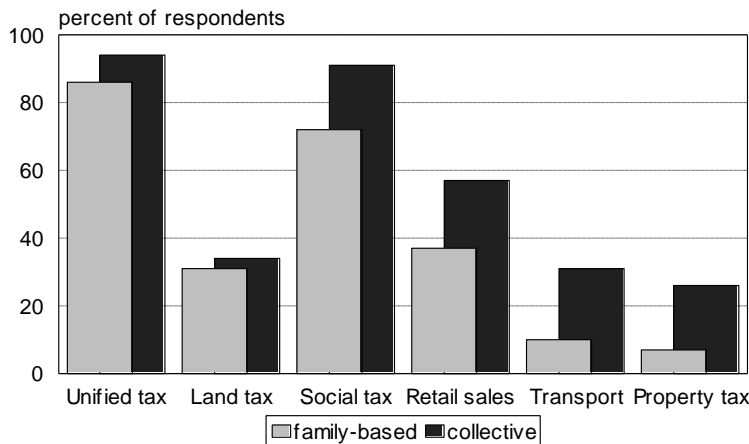


Figure 12.1.

The situation with social benefits appears to be dismal. Only 20% of respondents report that farm members are entitled to receive at least one of a range of five social benefits (other than pension) and 27% report that members are entitled to a pension – either from the state or from the dehkan farm (Table 12.2). In all cases the entitlement rate is significantly higher among members of collective and corporate farms (Figure 12.2). While these low figures may reflect partial misunderstanding of the question (e.g., some respondents may have thought they were being asked about benefits they actually receive, not benefits to which members are entitled in general), the results overall point to low awareness of and low access to social benefits among rural people.

Table 12.2. Perceived entitlement to social benefits among farm members (percent of respondents)

	All farms (n=142)	Family-based DF (n=107)	Collective/corporate types (n=35)
Pension	27	22	40
Other social benefits	21	14	43
Including:			
Sick leave	16	7	43
Maternity leave	17	10	37
Childcare allowance	13	7	34
Disability allowance	4	3	9

Perceived entitlement to social benefits among farm members (n=142)

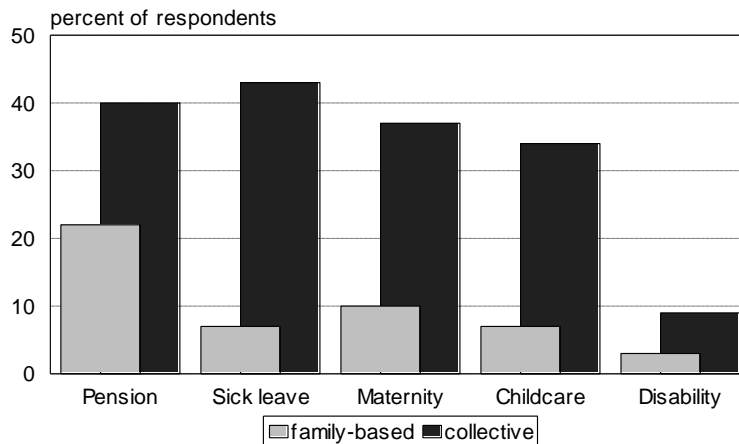


Figure 12.2.

Insurance is not a common risk-reducing tool among Tajik farmers. Only 27% of respondents carry any type of insurance (Table 12.3). The most popular approach is to insure the harvest (16% of respondents) and the vehicles (12%). Deviating from the pattern observed for taxes and social benefits, harvest insurance is more frequent among family-based dehqan farms (17% compared with 14% for collective and corporate farms). Other forms of insurance are more frequent in collective and corporate farms (Figure 12.3). There is negligible awareness of the need to insure immovable property or take out personal insurance (health and life).

Table 12.3. Insurance among surveyed farms (percent of respondents)

	All farms (n=142)	Family-based DF (n=107)	Collective/corporate types (n=35)
Carry any type of insurance	27	28	26
Harvest	16	17	14
Vehicles	12	9	20
Immovable property	5	4	9
Health and life	4	4	6

Insurance practices among farm members (n=142)

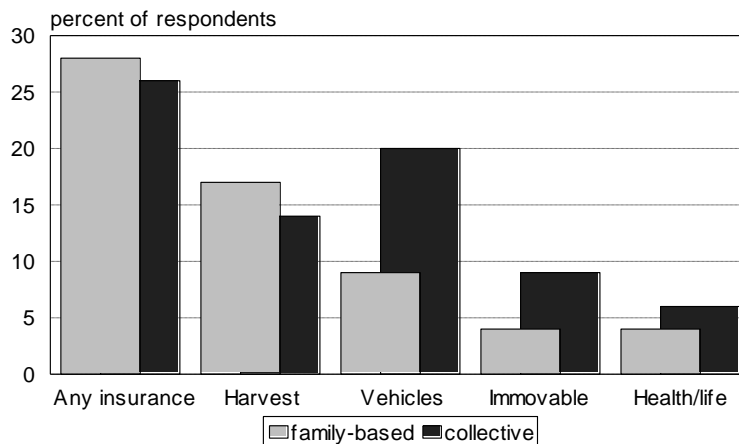
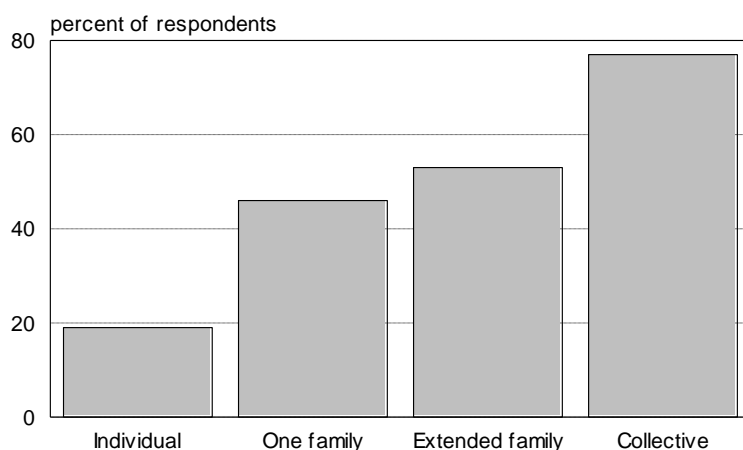


Figure 12.3.



Collective and corporate farms are more likely to have an accountant (77%) than family-based farms (44%). See **Figure 12.4**. Among family-based farms, there is an increasing progression from individual DF (19% with an accountant) to one-family DF (46%) to extended-family DF (53%). These trends may suggest that increasing organizational complexity makes the need for an accountant more obvious.

Farms employing an accountant (n=142)



**Figure 12.4.**

More than 75% of respondents have a work book (same proportions for family-based and collective farms), although there are indications that in some cases the work book is associated with an alternative place of work (school, military service), not the dehkan farm. The work book is generally kept at home, especially in family-based farms. In collective and corporate farms there is a higher tendency to leave the work book in the office or in the care of the farm head (**Table 12.4**).

**Table 12.4. Availability of a work book among farm members**

	All farms (n=142)	Family-based DF (n=107)	Collective/corporate types (n=35)
Have workbook	76	77	74
Kept at home	54	58	40
Kept in the office	20	16	34

**Table 12.5. Why people do not create dehkan farms? (percent of respondents)**

	All farms (n=142)	Family-based DF (n=107)	Collective/corporate types (n=35)
Shortage of machinery, inputs	59	62	49
High taxes	50	51	46
Complex, non-transparent process	27	27	26
Too expensive	56	52	69
Outside interference	16	13	26
No farming experience	27	27	26
Difficulties with documents	20	22	14
No social protection	25	25	23
Other	4		

A glimpse into institutional difficulties of dehkan farming is provided by a question that explored the views concerning reluctance to set up an independent farm (**Table 12.5**). Shortage of machinery

and inputs, including water, is at the top of the list, identified by 59% of percent as an obstacle. It is followed high costs and high taxes (56% and 50% respectively). All other factors are considered less serious obstacles. Members of family-based DF generally have a more severe view of the difficulties faced than members of collective farms, except on two counts: more members of collective farms view the separation procedure as costly and many more members of collective farms are deterred by prospects of outside interference (investors, authorities). In both instances, these concerns are probably fueled by the specific experience of collective DF members as distinct from members in family-based farms.

### 13. Access to information and legal issues

**Table 13.1** lists the respondents' answers to a series of 17 questions about their rights that were read to them by the interviewers. More than 50% of respondents knew their rights in 7 out of the 17 areas listed. The knowledge rate was particularly high (more than 70%) in the important areas of independence ("you are the owner of your production and revenue") and freedom to farm ("you are free to decide what crops to grow"). Most people also knew about security of tenure and their right to withdraw with a plot of land. There is less confidence in issues relating to business activities (such as entering into contracts and agreements or erecting service buildings) and less common legal points (compensation for indivisible joint property). There is glaring ignorance about the right to social benefits (which is consistent with the results on social benefits in the previous section, see **Table 12.2, Figure 12.2**).

**Table 13.1. Legal rights perceived by members of dehkan farms**

	Percent of yes answers (n=142)	Helvetas survey (Mar2011)
<b>A. High awareness issues</b>		
You are the owner of your production and revenue	70	51
You are free to decide what crops to grow	78	27
You may withdraw with your land share to create a dehkan farm	59	19
You may exit with your land share regardless of consent of other members	58	16
You have the right to receive compensation if your land is taken away	55	44
You may transfer your land use rights to another person	54	11
You have the right to receive an equivalent plot if your land is taken away	53	35
<b>B. Medium awareness issues</b>		
You may conclude contracts and agreements for conducting entrepreneurial activity	47	15
You are free to enter into any contracts or agreements	42	
You may construct service buildings on your land	38	26
You may buy, lease, or accept into temporary use the assets of other persons or organizations	37	11
<b>C. Low awareness issues</b>		
You have the right to receive insurance payments after a natural disaster	28	
You may mortgage your land use rights	24	11
You are entitled to choose or express preference as to what plot to receive on exit	24	9
You are entitled to compensation when joint property cannot be divided	21	9
You are entitled to receive social benefits for sickness, maternity, childcare, etc.	18	
You may use the underground minerals and deposits on your land	10	10

Farmers show considerable thirst of knowledge: most of the legal topics relating to the activity of dehkan farms aroused the interest of more than half the respondents (**Table 13.2**). Farmers showed relatively less interest in questions of termination, liquidation, and reorganization of a dehkan farm

and in contracts used for dehkan farm activity. Additional issues that were noted in respondents' comments include information on social benefits and social insurance. Only one respondent noted that "all the necessary information is available", and he was offset by another respondents who bluntly indicated that "information on all topics" was needed.

**Table 13.2. Topics on which more information is desired by respondents**

	Percent of yes answers (n=142)
Law of Dehkan Farms, rights and obligations of a dehkan farm	68
Land and land use in Tajikistan	56
Contracts used by dehkan farms for their activity	35
Financial accounting and taxation of dehkan farms	65
Inheritance law	49
Turning to courts of law	51
Termination, liquidation, and reorganization of a dehkan farm	39
Other issues	4

Land conflicts are generally referred to the jamoat chairman or the district land committee (**Table 13.2**). Head of dehkan farm and oblast authorities (the hukumat) are less popular options for conflict resolution, although turning directly to the police ("law enforcement organs") is surprisingly reported as an option by 42%. Recourse to Legal Aid Center or lawyers is reported by less than 10%, but this obviously depends on the actual spread of LACs in the area of the survey – a topic that requires further examination. Traditional mediation methods, such as turning to a respected elder in the village, play a marginal role today. The high priority of the jamoat chairman and the district land committee on our list matches the results of the recent Helvetas survey (March 2011); however, the low priority of the dehkan farm head (ranked fifth in our survey) is in contrast to the results of the Helvetas survey, where the dehkan farm head is preferred by 82% of farm members as the option for resolving land conflicts.

**Table 13.2. Who do you turn to resolve a land conflict?**

	Percent of yes answers (n=142)	Helvetas survey (March 2011)
Head of dehkan farm	26	82
Jamoat chairman	63	30
A respected person in the village (an elder, the local mullah, etc.)	6	
Oblast government (hukumat)	31	8
District land committee	52	27
Legal Aid Center	9	6
Private consultant or lawyer	9	
Police	42	
Other (association, "among ourselves")	2	

Nearly half the respondents (46%) are of the opinion that the legal and administrative environment has improved as a result of the land reform in the last two years. **Table 13.3** lists the dimension in which improvements are identified. Only irrigation receives a poor score for no improvement in the last two years.

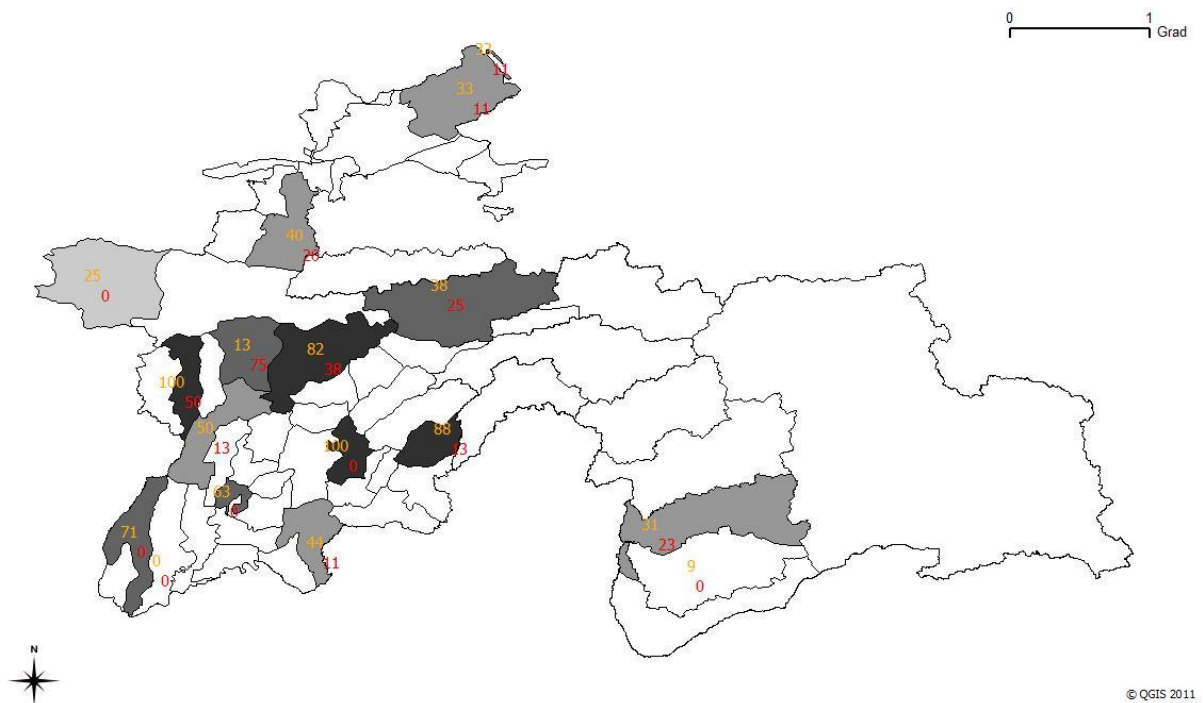
Farmers receive training and practical information mainly from international organizations and local NGOs (51% of respondents), but also from the state extension and consulting service (19%). Overall, 62% of farmers access this information channel (**Table 13.4**). A much smaller proportion of farmers (22%) have actually worked with international organizations, benefitting mainly from seed

and fertilizer distribution programs. Within this group, 41% of farmers received both seeds and fertilizers and another 38% received seeds only; only one respondent received fertilizer without seeds. Overall, 80% of farmers working with international programs benefited from distribution of inputs. Another important benefit from international organizations is obviously participation in trainings and workshops, reported by 47% of farmers working with international organizations (or 11% of all farmers).

**Table 13.3. How has the legal-administrative environment improved in the last two years?**

	Percent of yes answers (n=142)
Better legal-administrative environment overall	46
Easier to obtain a certificate of land use rights	24
Greater freedom in choosing what crops to grow	42
Fewer administrative obstacles	30
Better irrigation	7

The training and consultation numbers are additionally broken down by district in **Table 13.4**. This breakdown is used as the basis for the spatial picture presented in **Map 13.1**.



The gray shades indicate the percentage of people who received “any training”:

- Black 88-100 (4) >80
- Dark gray 70 75 75 63 (4) 61-80
- Medium gray 46 56 60 50 44 (5) 31-60
- Light gray 25 (1) 10-30
- White 0 9 (2) <10

The red figures indicate the percentage of people who received training from a state agency, the yellow the percentage of people who received training from international organizations.

**Table 13.4. Distribution of training and consultation activities by district (percent of respondents)**

Districts	q47: Did you receive any training or advice in agricultural activities?					q49: Did you work with international organizations? How did they help?					
	Number respondents	Any ag training, extension advice	State extension, advisory service	Private organizations	International organizations	Number respondents	Worked with international organizations	Fertilizer	Machinery	Seeds	Training
All sample	142	62	19	3	51	142	22	10	1	18	11
<b>GBAO</b>	<b>24</b>	<b>29</b>	<b>13</b>	<b>8</b>	<b>21</b>	<b>24</b>	<b>8</b>	<b>4</b>	<b>0</b>	<b>8</b>	<b>4</b>
Roshtqala	11	9	0	0	9	11	0	0	0	0	0
Shugnon	13	46	23	15	31	13	15	8	0	15	8
<b>RRP</b>	<b>48</b>	<b>81</b>	<b>40</b>	<b>2</b>	<b>60</b>	<b>48</b>	<b>23</b>	<b>13</b>	<b>0</b>	<b>21</b>	<b>10</b>
Varzob	8	75	75	0	13	8	25	13	0	25	0
Vahdat	16	94	38	0	82	16	6	6	0	6	6
Rasht	8	75	25	13	38	8	63	25	0	63	25
Rudaki	8	50	13	0	50	8	38	25	0	25	25
Shahrinav	8	100	50	0	100	8	0	0	0	0	0
<b>Sughd</b>	<b>27</b>	<b>44</b>	<b>11</b>	<b>0</b>	<b>33</b>	<b>27</b>	<b>26</b>	<b>11</b>	<b>4</b>	<b>19</b>	<b>11</b>
Asht	9	44	11	0	33	9	11	0	0	0	0
Ghonchi	10	60	20	0	40	10	30	20	0	30	20
Penjiket	8	25	0	0	25	8	38	13	13	25	13
<b>Khatlon</b>	<b>43</b>	<b>70</b>	<b>5</b>	<b>2</b>	<b>67</b>	<b>43</b>	<b>28</b>	<b>9</b>	<b>2</b>	<b>21</b>	<b>14</b>
Bokhtar	8	63	0	0	63	8	13	13	0	13	0
Kabodien	3	0	0	0	0	3	0	0	0	0	0
Muminabad	8	88	13	0	88	8	63	25	0	63	13
Temurmalik	8	100	0	0	100	8	63	13	0	25	50
Farkhor	9	56	11	0	44	9	0	0	0	0	0
Shaartuz	7	71	0	14	71	7	14	0	14	14	14

## References

- IPC (2011). “Tajikistan – Phases of Food Insecurity April 2011”, IPC – Integrated Food Security Phase Classification.
- Lerman, Z. and Sedik, D. (2008). *The Economic Effects of Land Reform in Tajikistan*. Policy Studies on Rural Transition 2008-1, FAO Regional Office for Europe and Central Asia.  
[http://www.fao.org/fileadmin/user\\_upload/Europe/documents/Publications/Policy\\_Studies/Tajikistan\\_en.pdf](http://www.fao.org/fileadmin/user_upload/Europe/documents/Publications/Policy_Studies/Tajikistan_en.pdf).
- LSMS (2007). *Tajikistan – Living Standards Measurement Survey 2007*, World Bank.  
<http://microdata.worldbank.org/lsms/index.php/catalog/18>
- TajStat (2010). *Agriculture in Tajikistan 2010*, statistical yearbook, State Agency of Statistics, Dushanbe.
- World Bank (2009). *Adapting to Climate Change in Europe and Central Asia*, World Bank, June 2009.
- World Bank (2011). *Mapping Vulnerability to Climate Change* [by Rasmus Heltberg and Misha Bonch-Osmolovskiy], World Bank, Policy Research Working Paper 5554, January.

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