"UTILIZATION OF LOW QUALITY WATER FOR HALOPHYTIC FORAGE AND RENEWABLE ENERGY PRODUCTION", ICBA PROJECT, SUPPORTED BY USAID AND NSF, SCIENCE PARTNERSHIPS FOR ENHANCED ENGAGEMENT IN RESEARCH (PEER) AID-OAA-A-11-00012

Report

Socio-economic survey of the Shurkul Lake's area, Kushkupir, Khorezm, Uzbekistan

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1. Summary

Socio economic survey of the selected village/mahalla was undertaken in the framework of the ICBA project entitled "Utilization of low quality water for halophytic forage and renewable energy production" supported by USAID and NSF, Science Partnerships for Enhanced Engagement in Research (PEER) AID-OAA-A-11-00012, and carried out in collaboration with the International Center of Agricultural Research in the Dry Areas (ICARDA), Regional Office for Central Asia and the Caucasus (ICARDA-CAC).

The survey was conducted stepwise and included data collection (structured interviews); data arrangement (cleaning/entry); data processing (statistical and graphical analyses); and description of findings.

In total 27 households living in the immediate vicinity to the lake have been randomly selected during transect walks and interviewed. The report summarizes the main findings of the socio-economic survey with regards to general information about the surveyed households; livestock practices; opinion on access and availability of fodder; household's sources of fuel for heating and cooking; access to fuel sources; crop cultivation practices; perception of households on the vegetation around the lake; household income structure; household expenditure structure.

2. Background

2.1 The Khorezm region of Uzbekistan and Kushkupir district

Khorezm is a 680,000 ha large administrative region located in the lower reaches of the Amudarya river in north-western Uzbekistan (Figure 1). Khorezm is located in the semi-desert zone (41-42°N latitude and 60-61°E longitude) and is surrounded by the Kizylkum and Karakum deserts. The mean annual temperature is about 13°C, the mean temperature during the coldest month January is approximately -2°C with absolute daily minimums as low as -28°C. Summers are hot, with mean monthly temperatures in July reaching about 30°C and daily extremes as high as 47°C. The long-term average annual precipitation is 100 mm, in some years amounting to only 30-40 mm (Glazirin et al. 1999). Most precipitation falls in November-March, which is outside the crop-growing season. The annual potential evapotranspiration amounts to about 1,500 mm.

The soils are mainly loamy and clayey-loamy, but are highly stratified, mixed with sandy and sandy-loamy soils and are potentially susceptible to wind erosion. Khorezm's soils typically have low natural fertility (Akramkhanov, et al. 2012). All topsoils in the region suffer from soil salinization to a lesser or greater degree, which requires leaching (up to three times in winter and early spring) to flush the salts from the soil. Forkutsa et al. (2009) cited the analyses by Ministry of Agriculture and Water Resources that classified 55% of the irrigated lands in Khorezm as slightly saline (2-4 dSm-1), 33% as medium saline (4-8 dSm-1) and 12% as highly saline (8-16 dSm-1). Salinity is made worse by an irrigation system that is only about 30% efficient and a poor drainage system which needs substantial improvements (Tischbein, et al. 2012). Furthermore, the results of the ZEF/UNESCO Khorezm project showed that 34% of the agricultural land in Khorezm can be classified as marginal and not suitable for conventional crop production. These areas, scattered throughout the region, are prone to further degradation and should therefore be considered for rehabilitation. Marginality of land depends by the location within the irrigation system of Khorezm (Conrad et al. 2007), i.e., the further away from water

intake points, the higher the general occurrence of marginal land. The marginality increases with the distance from irrigation water intake points.

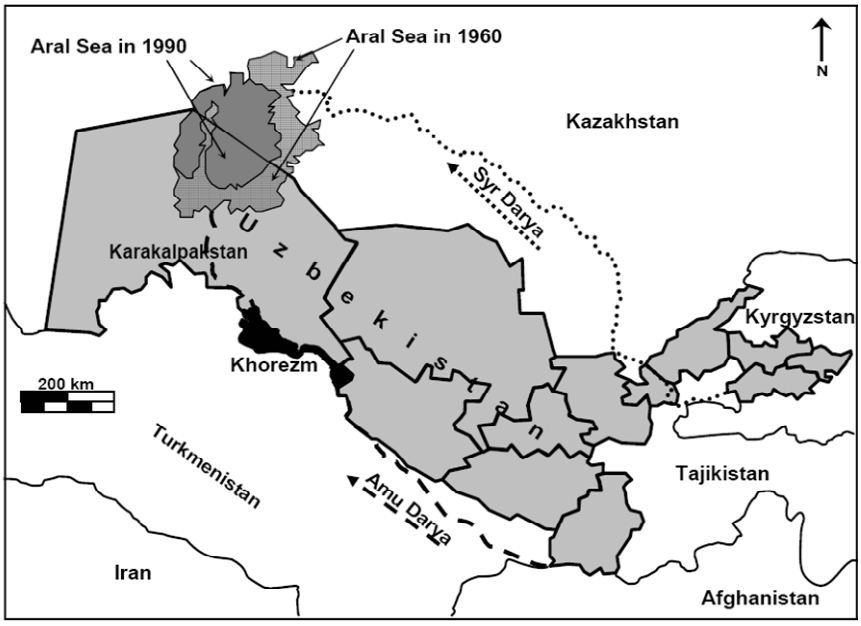

Figure 1. The location of the Khorezm region in Uzbekistan
Source: Mueller, 2006

Soil degradation in the study region is predominantly caused by soil salinization and water logging, in turn caused by poorly functioning drains or lacking drainage, a continuous salty recharge of the groundwater by percolation, seepage losses to the groundwater during conveyance and distribution due to unlined channels, excessive irrigation with low efficiency at field level, excessive water use during pre-season leaching, and the increasing use of saline water sources for irrigation. A possible avenue for reclamation of saline lands and/or lands degraded through waterlogging with saline water is the use of halophytic plants that take salts out of saline soils and water.

From the total territory of Khorezm roughly 270,000 ha are suitable for irrigated agricultural production. In 2013, 203 thousand ha have been cultivated throughout the region. Agricultural production and rural livelihoods in Khorezm rely entirely on irrigation water supply, which comes from the Amudarya river.

Regional economy is based on agriculture, which contributes over one third to the regional GDP and employs about 40% of regional labor force. From the 1.7 million people living in Khorezm, over 70% reside in rural areas and are mostly engaged in crop production, either as commercial farmers under a state plan, or as dehqons (or rural households). Cotton still accounts for 46% of agricultural land use in the larger agricultural land plots in Khorezm, followed by winter wheat and rice at 23% and 21%, respectively (Conrad 2007). Maize, sorghum, fruits, and vegetables are also commonly cultivated, mostly on smaller peasant plots.

The lack of strategic raw materials such as oil, gas and other fossils in the region, makes agriculture of utmost importance and calls for the production of cash crops or high value added crops. Unemployment rates are high, and about 28% of the population lives below the poverty line of US$ 1 per day (Bekchanov et al. 2010).

Kushkupir is one of the ten administrative districts within Khorezm, located in the western part of the region (Figure 2) and in the tail end of the irrigation network. Kushkupir district has been

identified as one of the districts with the highest share of marginal land and the lowest average water productivity.

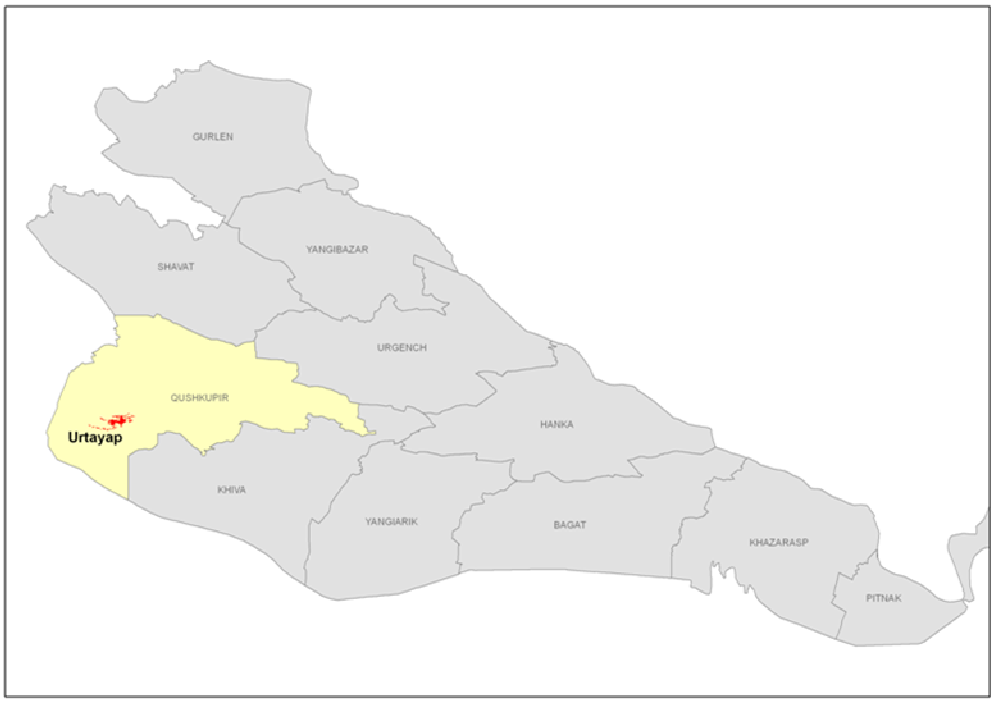

Figure 2. The location of Kushkupir district and village Ortayap
Source: GIS center, UrDU, KRASS

Total territory stands at 53,929 ha, of which 23,987 ha are arable land, cultivated by 504 farmers. 5,908 ha are used by 25,894 households for house buildings, backyard gardens, and cropping fields. The average area per household in Kushkupir thus is around 0.22 ha.

In total there are 56 mahallas in Kushkupir district, including 43 mahallas in the rural area. One of the rural mahallas – mahalla "Tinchlik", located in the Ortayap village of the Kushkupir district has been selected as a study area for the PEER socio-economic survey and will be described in details throughout the report.

The village of Ortayap is located adjacent to Shurkul Lake and has a total territory of 1,752 ha, approximately 11,000 residents. With regards to social infrastructure, there are 2 kindergartens, 4 schools, 1 small village based hospital in Ortayap. There is no college in Ortayap, but there is 1 Agricultural college in the next to Ortayap village of Oktarband. The village of Ortayap has central electricity and gas supply lines, a fairly well developed transportation (paved roads) network. There is no industry, so the majority of the population is involved in agriculture either as farmers, dehqons, or seasonal workers.

Mahalla "Tinchlik" occupies around 200 ha and provides livelihood for the 2000 residents. There is 1 school within this mahalla.

2.2 Information on the project and the survey

Socio economic survey of the selected village/mahalla was undertaken in the framework of the ICBA project entitled "Utilization of low quality water for halophytic forage and renewable energy production" supported by USAID and NSF, Science Partnerships for Enhanced Engagement in Research (PEER) AID-OAA-A-11-00012, and carried out in collaboration with

the International Center of Agricultural Research in the Dry Areas (ICARDA), Regional Office for Central Asia and the Caucasus (ICARDA-CAC).

The project on halophytic forage and renewable energy production is a logical continuation of NSF EAR-0838239 research on "Investigating pesticide contamination in small lakes in Khorezm, Uzbekistan" by targeting the cultivation and sustainable production of halophytes for forage and renewable bioenergy uses on unproductive marginal saline or highly degraded lands surrounding numerous small lakes in the Aral Sea Basin in Uzbekistan. Research by NSF EAR-0838239 has indicated the small lakes having potential as an aquatic resource for fisheries or irrigation water supply. However, this potential is threatened by the high salinity levels of the surrounding soils. Hence, reclaiming saline lands near the lakes may benefit the economic utility of both land and water by reducing salt loads to the lakes.

The project on "Utilization of low quality water for halophytic forage and renewable energy production" aims to evaluate multi-stage phytoremediation of salt-affected lands using halophytes in order to support livestock farming and biofuel production to secure livelihoods of rural poor communities. The project will include laboratory experiments, as well as field experiments in two environmentally challenged areas of Uzbekistan: Shurkul Lake in the Khorezm region, and an artesian spring with thermal saline water in the Kyzylkum desert. The creation of highly productive arid livestock fodder or biofuel farming systems will increase the income of rural communities.

Shurkul Lake with moderate salinity level and one of the lakes within the NSF study, was selected as a target lake for research in the framework of the project. The activities included laboratory and field experiments combined with participatory work of local farmers, herders and land managers to assess the potential for integrating land reclamation using halophytes with bioenergy production and livestock feeding source as degraded lands are made fertile.

Research within the project is carried out in collaboration with the Institute of Water Problems of the Academy of Sciences of Uzbekistan, Urgench State University, the Hydrometeorological Research Institute of Uzbekistan, and the NGO KRASS (Khorezm Rural Advisory Support Service). It is expected that collaboration with researchers from different academic institutions and practitioners (farmers, land managers) will provide data for examining implications of results to other regions with similar environments. It is also expected that the research will particularly benefit small, remote, rural communities with limited energy and fodder supply, and will ensure sustainable land/water use and stabilization of ecosystem function.

The socio-economic survey has been undertaken with regards to one of the tasks within the project on analysis of economic feasibility of using halophytes for land reclamation, forage and biofuel production, as well as the tradeoffs of such development with water quality and economic productivity of water bodies.

2.3 The research site – Shurkul Lake

The expansion of irrigated agricultural production in Central Asia in the mid twentieth century changed the landscape of the Aral Sea Basin: the sea has almost disappeared, whilst hundreds of new lakes, or 'kuls' in Uzbek were formed as irrigation runoff water filled natural depressions. Although many of the lakes may have existed before construction of large-scale irrigation and drainage canals in the Khorezm region, the depth, flow regime, salinity, and nutrient levels in these lakes are now largely controlled by inputs from irrigation runoff waters (Scott 2009).

Shurkul Lake is located in the southwest of Khorezm (Figure 3). Results from NSF EAR-0838239 determined that the lake is slightly over 100 years old with a sedimentation rate of

about 0.5 cm per year. Examination of Shurkul cores show increases in organic matter over time. Since 1963, when the lake had peak organic matter concentrations, these concentrations have stabilized but have not recovered to peak values. The reason for this decline in lake productivity (production of organic matter) is unknown, but the pattern is similar in other lakes. Salinity increases may be a contributing factor in limiting lake productivity.

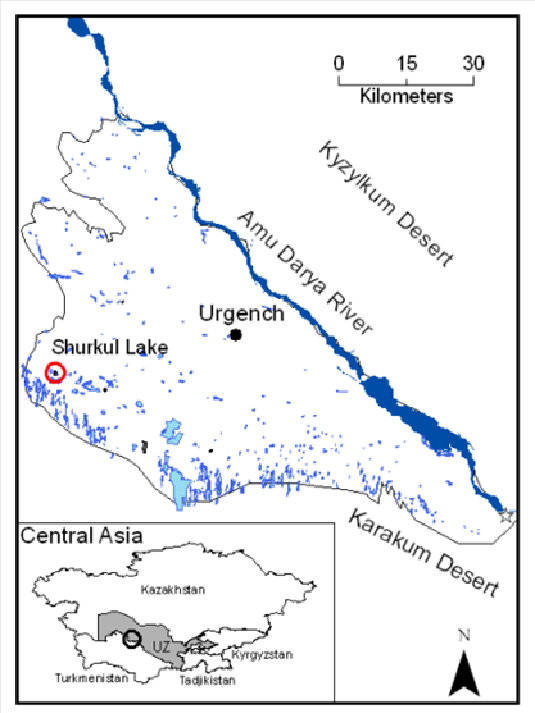

Figure 3. The location of Shurkul in the Khorezm region
Source: Oberkircher, 2010

Agriculture accounts for 41% of all land use within 0.5 km of Shurkul; in the last years the primary crops that constituted that agricultural use were identified as cotton (41%), wheat (59%), rice (9%) and vegetables. Cropping patterns vary between years, especially the area cropped with rice, which changes according to water availability.

During the drought in the vegetation season of 2008, residents of settlements surrounding Shurkul (Figure 4) suffered from reduced irrigation and domestic water supplies. To help the villages near Shurkul to overcome the problems caused by water scarcity, scientists from the ZEF/UNESCO Khorezm research project have worked extensively in the area. Scientists had expected that securing drinking water and irrigation water availability would be important topics to the community. However, many of the local stakeholders showed their concern for the drastically-reduced water level in Shurkul, and wanted to take measures to restore it to its pre-drought state. This unexpected priority led to an interdisciplinary study to analyze various dimensions of the Shurkul landscape and examine the water body's role in the lives of local residents. Beyond the ecological and economic dimensions of the lake landscape, an important socio-cultural dimension was observed, and it was apparent that the latter played a significant role in the environmental perceptions of the rural population.

Figure 4. Shurkul and the surrounding villages
Source: Oberkircher, 2010

Lakes in Khorezm are mostly regulated by irrigation water runoff and evaporation with lesser contribution from groundwater (Scott 2009). Shurkul Lake receives surface water input from at least one drainage collector, as well as seasonal direct runoff from adjacent fields. Khorezm soils are generally of low fertility, resulting in the heavy application of fertiliser. However, despite estimated seepage of applied nitrogen fertiliser to groundwater (Ibrakhimov et al. 2007), nitrogen inputs to Shurkul Lake are low during most seasons and do not appear to be correlated with local agricultural use (Oberkircher, 2010).

Most of the lakes in Khorezm are shallow with an average depth of 1-2 m. Therefore, they experience large seasonal shifts in water temperature. A maximum depth of ~3 m was measured during high water levels in Shurkul. Seasonal water temperatures may range between 2 and 30°C, with neutral pH of 7.5 to 8.1 and dissolved oxygen concentrations generally inversely correlated with water temperature. Salinity in the lake was moderate at 2 g/L during 2006 and 2007, but increased threefold to almost 6 g/L during the drought year 2008. Despite reported past heavy application of polarised pesticides such as DDT, only very low levels of such pollutants were measured in the lake water column (Oberkircher, 2010).

Shurkul Lake fulfills several functions, including ecosystem functions of wildlife habitat, foodweb support, and excess nutrient removal (fertilizer from surrounding fields). The lake also holds economic importance as a source of fish, fodder, building material, grazing ground. Population of the surrounding village Ortayop is aware of both ecosystem and resource functions. In addition to the ecological and economic functions, the lake landscape also has a socio-cultural dimension. It is part of local ecological knowledge, functions as a prestige object and recreational site, and is rooted in religious beliefs of the population as a symbol for God's benevolence. Figure 5 summarises the ecological, economic and social functions of Shurkul Lake and its landscape.

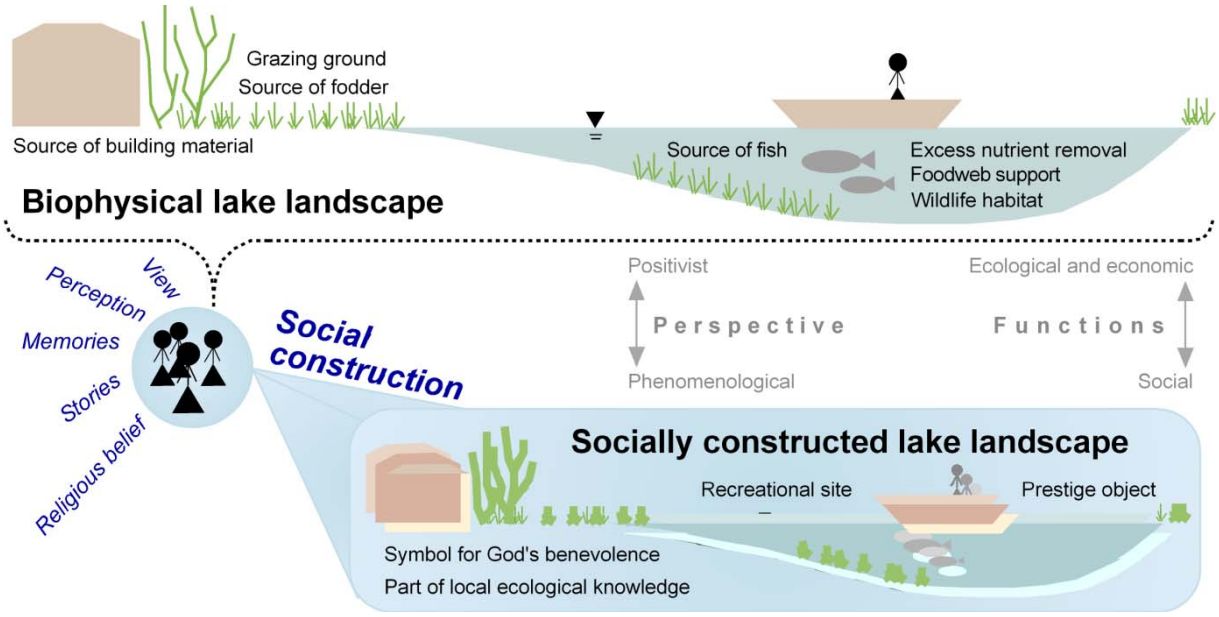

Figure 5 Ecological, economic and social functions of the lake
Source: Oberkircher, 2010

Lake as a habitat. Shurkul Lake supports a variety of flora and fauna. Although the surface area of most Khorezm lakes is small, during the agricultural growing season the lakes are interconnected to each other and to the Amudarya river by irrigation and drainage canals. Therefore, these small lakes provide permanent habitat for some fish, spawning habitat for other fish, and perhaps feeding and predation protection for others as they migrate between the lakes and connected canals. Additionally, the nutrients lead to the growth of aquatic reeds surrounding the shores of Shurkul and similar lakes. These reeds not only provide habitat for aquatic species, but are also harvested by villagers for domestic needs. Water quality and aquatic foodweb measurements indicate that despite the presence of intensive agriculture on much of the land immediately surrounding the lake, the overall water quality would be suitable for recreational use by the local population (Oberkircher, 2010).

Lake as an ecological indicator. Often, water supply through the canal system is unreliable at the tail end of the irrigation system where Shurkul is located. In such cases groundwater becomes an important water source not only for domestic uses such as drinking, cooking, and other, but also for irrigating the backyard gardens. In times of water scarcity, local population checks the lake water level as an indicator for available groundwater supply. The desiccation of the lake in 2008 alarmed people, since it reflected the low water availability in the hydrologic system. In addition, the state of the lake was mentioned as a mirror and causal factor for the general health of the environment, both in the drought season of 2008, as well as the water abundant vegetation season of 2009. The residents were reporting that the lake is important, that with a lake plants will grow, there will be fish and water plants, that the lake's importance for the ecology is obvious (Oberkircher, 2010). Also important, the lake is regarded by local elderly people as one element of an interconnected ecological system and can be used for weather forecasting (for example, if the water of the lake is dark, it will rain).

Lake as a recreational site. The lake landscape has a special significance in the daily lives of the local population. It is considered a site of beauty and recreation. May of the people living in the lake surroundings have pleasant stories to tell about time spent on the lake. Childhood adventures in dense vegetation are recalled and fishing is frequently mentioned as a pleasant

pastime. Furthermore, feeling close to nature is considered a pre-requisite for commitment to environment-friendly behavior (Schultz 2002).

3. Methodology

Socio-economic survey and analysis of economic feasibility of using halophytes for land reclamation, forage and biofuel production was conducted stepwise and included data collection (structured interviews); data arrangement (cleaning/entry); data processing (statistical and graphical analyses); and description of findings.

3.1 Data collection

The survey was carried out in Ortayap village of Kushkupir district of the Khorezm region, mostly in "Tinchlik" mahalla, located in closest vicinity to Shurkul Lake. A semi-structured questionnaire (annexes 1 and 2) consisted of 11 pages, 10 major sections, including general information about the surveyed household; livestock practices; opinion on access and availability of fodder; household's sources of fuel for heating and cooking; access to fuel sources; crop cultivation practices; perception of households on the vegetation around the lake; household income structure; household expenditure structure.

The structured interviews focused on details on the location of the households (e.g., location of the village), socio-economic factors (e.g., increasing population, sex ratio, etc.), agricultural production factors (e.g., agricultural inputs, agricultural knowledge). Furthermore, the survey collected information on household demographics, land access and cropping patterns, and activities that contributed to household wellbeing. The survey also requested respondents to rank their most important livelihood sources (i.e. those that generated the most "income"—cash or in-kind—for their households). Livelihood activities were divided between those derived from agricultural production, including livestock production, and from "nonfarm" options.

The questionnaire was prepared originally by the specialists of ICBA project entitled "Utilization of low quality water for halophytic forage and renewable energy production" supported by USAID and NSF, Science Partnerships for Enhanced Engagement in Research (PEER) AID-OAA-A-11-00012, and then translated into local (Russian) language and adjusted by the KRASS specialists where necessary. Predominantly individual interviews (with several exceptions when the whole family participated in the discussions) have been applied when collecting the data.

The interviews were conducted during transect walks through the village Ortayap, and the selection of interviewees was random, meaning all villagers who were present and willing to talk were included. The 27 interviewees included male and female household members (not necessarily the head of the household) of different age groups. Particularly with older people, interviews included oral history accounts of the characteristics of the lake landscape in the past as well as of memories of their own experiences and past activities in relation to the lake.

3.2 Data arrangement and data processing

Data from the filled-in questionnaires was entered and stored in Excel. The established database was used for statistical analysis of survey responses. Statistical analysis of the data included: descriptive statistics (means, maximum, averages, etc.), identification of frequencies and percentage/distribution of answers, proportion of respondents with various thematic feedback. Modern Excel program allowed for conducting also the graphical analysis and description of findings for a better visualization of the survey results.

3.3 Description of findings

All graphs created in Excel were transferred to Word document of a certain structure for further description of findings. Each graph got its caption with a concise and catchy wording. A short description was provided to each graph explaining in a couple of sentences the main findings (Chapter 4 of the report) with regards to a corresponding section and question.

4. Key findings

4.1 General information about surveyed households

Households located in the immediate closeness to the Lake have been surveyed. The general information about surveyed households included information about the size of their household plots, the location of their houses with regards to local market, information about family

members such as age, education, current occupation, involvedness of households members in animal and poultry breeding and cropping activities.

4.1.1 Land use

All land resources in Uzbekistan are the property of the state, which regulates and monitors the land use. Most of the available arable land resources are devoted to agricultural production either by the farmers (registered legal entities) or by dehqons (rural households). Whereas the farmers lease the land from the state for the period of up to 50 years, dehqons get the land for life-time inheritable use. According to the Land legislation dehqons may lease land of the maximum size of 0.12 ha for house buildings/dwellings and additional 0.12 ha for cultivating agricultural crops, which however depends on the availability of 'free' land in the given district or region. Households mainly use land plots as backyard kitchen gardens or a specified area within the main farmland of the farmers, and are free to choose their crops and sell at their own discretion.

In the surveyed group of households the same trend of land size was observed. The average land size was around 1200 m^2 occupied by the house and the garden where households cultivate mostly vegetables, fruit trees. Some households reported to have 1000 m^2 and only one household succeeded to get additional 1200 m^2. Despite most of the households are predominantly poor, most of them would like to have additional plots in particular for production of fodder crops. In reality, due to constant growth of population on the one hand and due to limited available land resources on the other hand it is very difficult to get such additional land plots from regional administration. In such cases, agricultural area (cotton fields mainly) would have to be taken out of agricultural production and transferred to households, which is not desirable by the administration.

4.1.2 Households' family size

Family size in rural areas of Uzbekistan has been decreasing in the last decades, albeit at slower rate compared to the urban families. 20-40 years ago it was normal to have many children and thus large families of more than 10 family members. Nowadays, the general trend is to have 2-3 children both due to life conditions and due to state birth control regulations. Likewise in the majority of surveyed households (59%) there are 4-6 family members, in one third of households there are 7-9 family members (in most cases these would include elderly members – grandparents). On the extreme edges one household reported to have 13 family members and two households have up to 3 members (few cases of divorced families) (Figure 6).

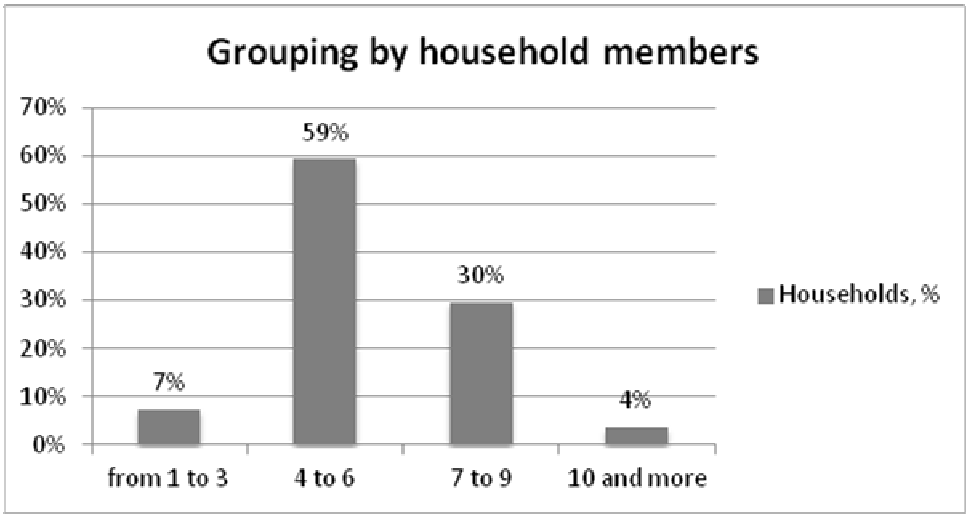

Figure 6. Family members in the surveyed households

4.1.3 Educational level of household members

Literacy rate in Uzbekistan is reported to be 99%. Virtually all citizens throughout the country do have school education. In order to increase educational level of the population and access to education numerous colleges, lyceums, etc. have been built in the country including rural areas. However, higher educational institutions are located in regional centers (Urgench in our case) or and most of them in the capital city – Tashkent. Not that many people from the remote rural area thus have possibilities to continue with higher education.

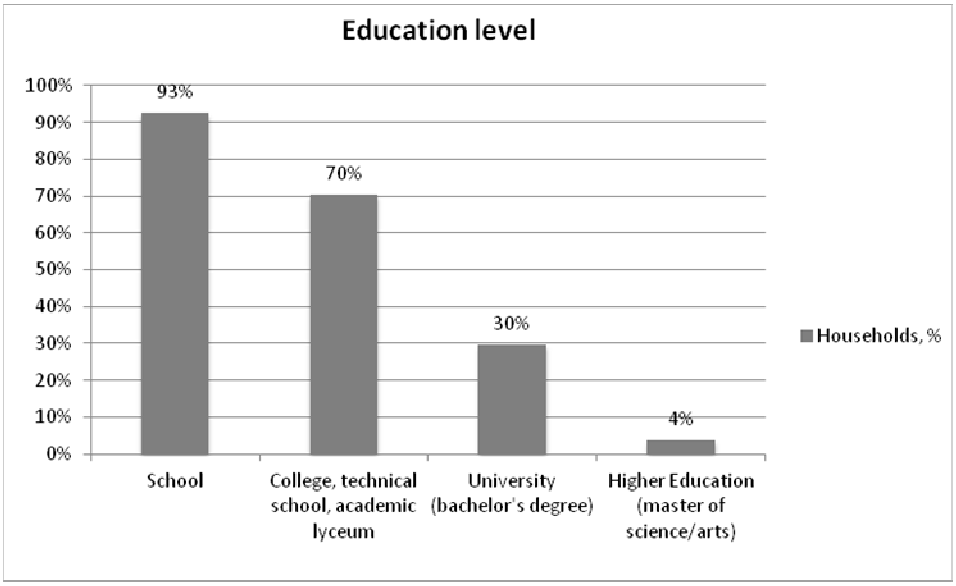

Figure 7. Educational level of the members of surveyed households

About 93% of the surveyed households reported to have school education (Figure 7) or to have currently family members attending schools (the remaining 7% have either small children or teenagers attending colleges). 70% of the households have family members with secondary education. About third (30% or 8) of the households have members who did or will earn a bachelor's degree. Majority of the elder members completed only 10-year school during Soviet times. Currently, after the reformation of the educational system of Uzbekistan, youngsters aged 16-18 study at colleges, academic lyceums after completing a 9-year school study.

4.1.4 Occupation of household members

Around 60% of the surveyed households have children or teenagers attending school and college respectively (Table 1). At most of the families (63%) there is at least one housewife taking care of the household, or at least one member working at a farmer's field (56% of respondents). One third of the surveyed households have family members working outside agricultural sector: either in educational sphere (university, kindergartens), construction or other seasonal non-agricultural sphere, labor migrant to Russia or Kazakhstan. But these are rare cases. None of the surveyed households owns or runs private business.

Table 1. Occupation of the household members

Occupation	Households, number	Households, %
He/she is a child and goes to Kindergarten or stays at home	16	59%

He/she goes to school, studies at school, at technical college, lyceum	15	56%
He/she goes to institute, university	2	7%
Pensioner	9	33%
Housewife and sits at home	17	63%
Disabled, does not have capacity to work	1	4%
Unemployed and doesn't receive a salary	2	7%
Runs own private farm business	0	0%
Runs own business	0	0%
Employed as a worker at another farm	15	56%
Works as a seasonal worker at another farm	9	33%
Works in MTP, association of private farms, water user association	1	4%
Works in commercial / private firm	0	0%
Works in education sector, including kindergartens	8	30%
Works in public health service, in hospital, in poliklinika	1	4%
Works in the administrative bodies/ in government, for instance in khokimiat	0	0%
Works privately (seasonal worker in construction for example)	9	33%
Works abroad (CIS)	8	30%

In general, average low level of education of surveyed households (secondary and not higher) limits their occupation opportunities at well-paid jobs. In addition, as mentioned before there are no industry or higher institutions where the qualified people could be hired. Thus most of the households are doing subsistence agriculture, i.e. cultivate crops or keep cattle and poultry at their plots. Both male and female family members, which are not officially occupied at jobs are involved is such agricultural activities with the exception of small children or teenagers, attending colleges outside the village.

4.2 Livestock

4.2.1 Households with livestock and livestock availability

Because of subsistence type of agricultural production of the surveyed households, almost each surveyed household possesses poultry (chicken, turkey), while none of them has horse, having a goat or a donkey is in general also very rare in the surveyed village (Figure 8). One household breeds the maximal number of 70 units of poultry, while the average number is 14. More than half (59%) of surveyed households keep cows, though, on average only 1 cow due to the lack of fodder. More than a third (37%) of surveyed households has exactly one calf. About a quarter (26%) of the households does have on average 4 units of sheep. Bull is available at one fifth of the surveyed households (Figure 8). Livestock for households is one of the essential sources of food and income. However, for most of them the number of livestock and their variety is constrained by the income and the fodder availability.

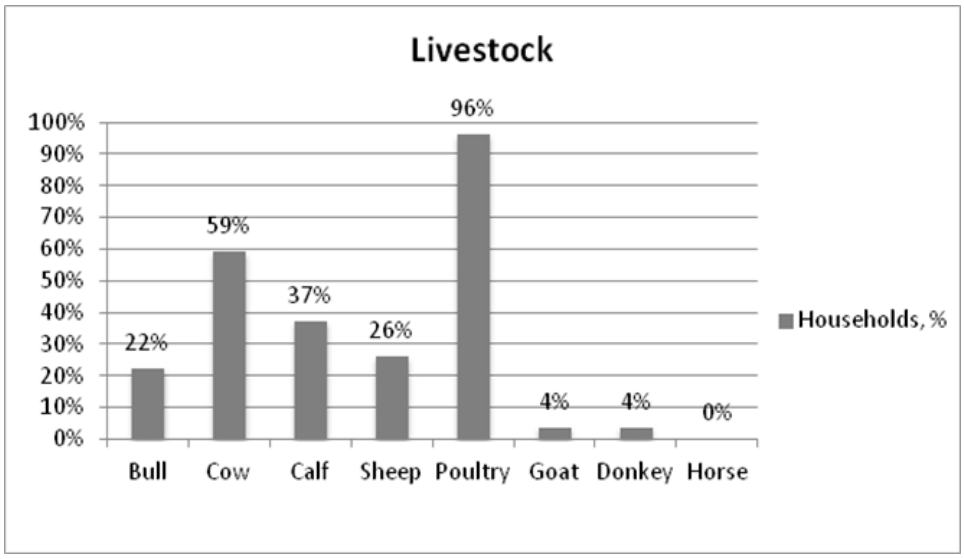

Figure 8. Livestock ownership of the surveyed households

4.2.2 Sources of fodder for domestic animals

There is a variety of fodder sources available in the rural area. During the survey the following 2 main sources have been identified by households, which keep cattle. Primary and most important fodder source for bulls and cows (83% and 75% respectively, Table 2) is crops, produced on households' plots. Around half of the households use own crops to feed their calf, sheep and poultry. Purchased crops are the main source of fooder at households that have poultry (42%), calf (30%), sheep and cow (14%). Very few households use grass near the lake, as well as crops earned for working at farm fields, as primary source of fodder for their livestock. Still, a few of the surveyed households have their sheep and poultry grazing near canals and in the fields.

Table 2. Main fodder sources for the surveyed households

Sources	Bull	Cow	Calf	Sheep	Poultry	Goat	Donkey
Grazing near canals and in the fields	0	0	0	14%	4%	0	0
Grazing near the lake	0	0	0	0	0	0	0
Grazing in the flat land	0	0	0	0	0	0	0
Crops produced at own household plots	83%	75%	50%	57%	46%	100%	100%
Crops received for working on farm fields	0	6%	10%	14%	8%	0	0
Grass harvested near the lake	17%	6%	10%	0	0	0	0
Feed with purchased crops or another type of fodder	0	13%	30%	14%	42%	0	0

In case of fodder shortage (especially late winter-early spring) most households purchase the required amounts of mainly cotton husk for cattle and wheat bran or maize grain for poultry at the local market, which is located 1-1.5 km from the surveyed mahalla.

4.2.3 Reason for keeping livestock

Two major reasons for keeping livestock have been reported during the survey. First and most important in conditions of subsistence agricultural production is breeding livestock for home consumption. This concerns mainly cows (88% of the respondents) for diary products, sheep and

poultry (86% and 92% respectively) for supplying households with meat and eggs (poultry). Second reason is breeding livestock for sale at local markets. This reasoning concerns mainly bulls (83%). Calves are kept for both future selling (in case of male calves) and for keeping in the household (for female calves) (Figure 9).

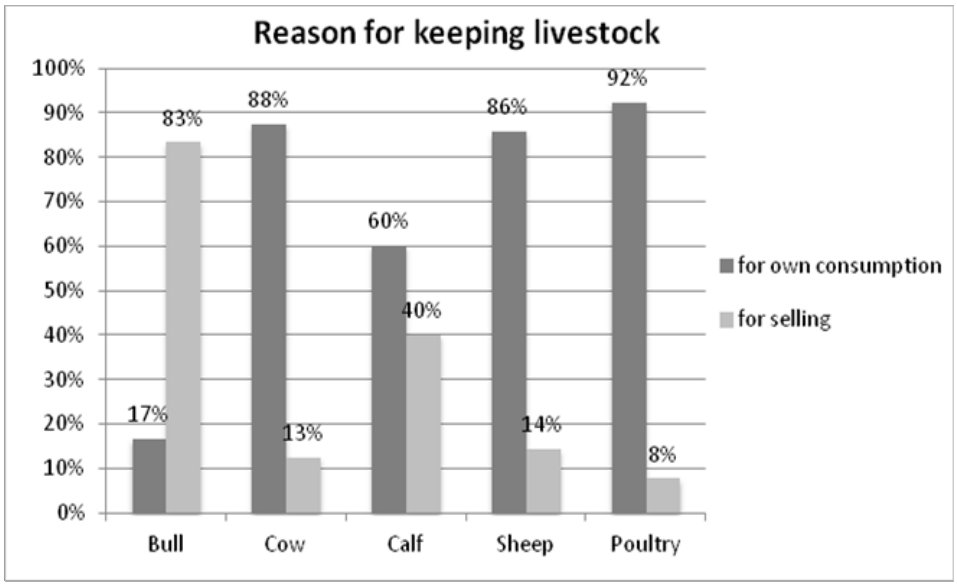

Figure 9. Reasons for breeding cattle and other livestock

4.3 Access to fodder

4.3.1 Fodder shortage and fodder purchase frequency

In many occasions during the survey it was reported that the small land plots of the rural households on the one hand and low quality of land (saline soil, water logging, low fertility) lead to the insufficient production of fodder crops and as a result fodder shortages. 85% of the surveyed households reported to suffer from fodder shortages during the year. Shortages usually occur late winter – early spring. No problems with fodder were reported in summer (when animals can graze) and autumn (immediately after fodder crops harvesting).

To cope with fodder shortages the households have no other choice as to buy the required amounts of fodder at local market. Interesting trend was observed with regards to how often do households buy fodder. The poorer the family the more frequently it needs to buy fodder, because only limited financial resources can immediately be spent on purchasing fodder. Better-to-do families can set aside more funds for purchasing fodder and thus do not buy frequently and little amounts, but buy occasionally and bigger amounts. 44% of the surveyed households have to buy fodder every week (Figure 10), 8% of the respondents purchase fodder every two weeks, 28% - once a month and only few households can buy large amounts of fodder once in a season or once-twice a year.

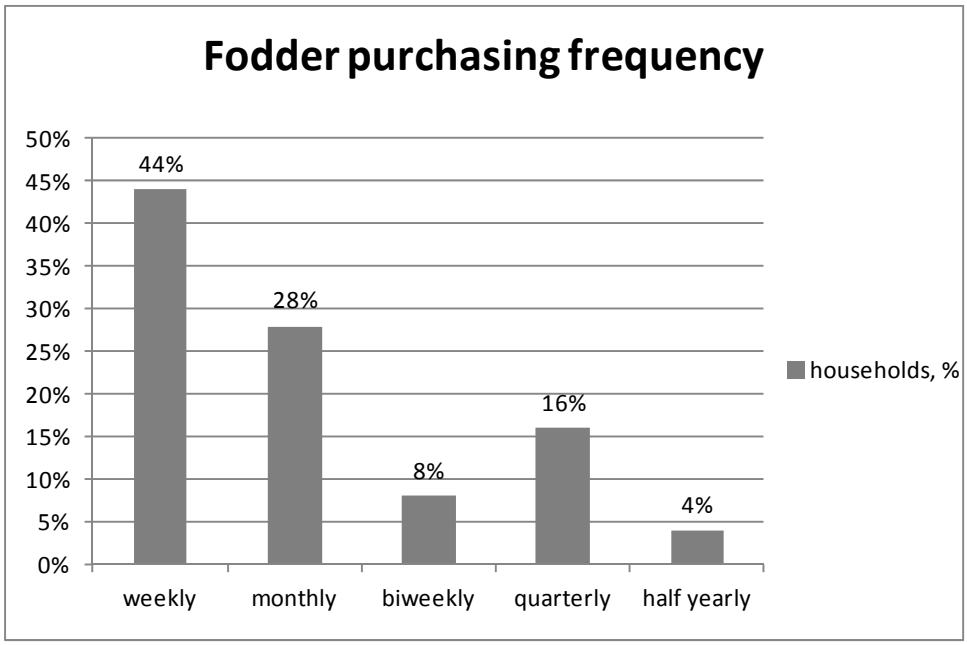

Figure 10. Frequency of fodder purchasing

4.3.2 Total time and distance for fetching fodder

Usually the land plots of rural households are located not far away from the houses and thus to cattle/poultry stables. On average 64% of the respondents reported that they need to go 500-1000 m to get fodder (Figure 11). 24% of the surveyed households said they have to travel more that 1 km, these must be the cases of market visits. Few respondents need to cover the distance less than 100 m or more than 1,500 m from their houses in order to bring fodder.

Thus, since the distance to fodder source (land plots, in some cases plots within farmers' fields or the market) is not so long, 76% of households need 1-2 hours to fetch fodder to the house or stable. Few respondents need 3 and more hours to supply fodder to their household.

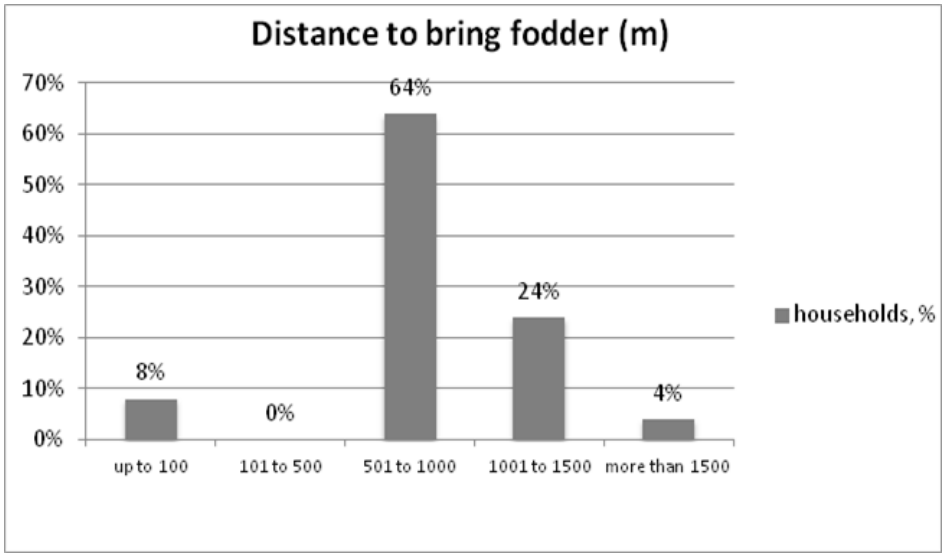

Figure 11. Distance to fodder source

4.3.3 Household members responsible for bringing fodder

With regards to who is responsible for fodder supply to the household during fodder shortages, the majority of the surveyed households reported male adults of the family (64% of the respondents) to be responsible for this activity, whereas 36% of the households rely on female adults in fodder supply. Interestingly, in none of the surveyed households both girls and boys fulfill the task of bringing fodder to the house/stables (Table 3).

Table 3. Family members responsible for fodder supply in the surveyed households

	Household	Share, %
Female children	0	0
Male children	0	0
Female adults	9	36%
Male adults	16	64%

4.4 Fodder type

4.4.1 Usage of fodder

Many types of fodder were reported to be used to feed the animals by the surveyed households. Such fodder types as wheat straw and bran, rice straw and husk, green maize and sorghum, maize and sorghum grain, cotton seed husk and cake, and finally grass near the lake were among the mentioned fodder types. It has to be stressed that all rural households including the surveyed ones use a combination of fodder types and not only one type.

Wheat is a very important crop in Uzbekistan. Despite it was introduced on a large scale recently (since independence) in the framework of the state program of self sufficiency in grains and for the reasons of food security in the country, agricultural producers learned very quickly the technology of its cultivation. Wheat is widely grown throughout the country and especially by rural households for 2 reasons: to feed the family (wheat grain) and to feed the animals (cattle - wheat straw, poultry – wheat bran). Likewise during the survey the mostly used fodder type appeared to be wheat straw and wheat bran (81% and 100% respectively), green fodder as maize and sorghum are used by 59% and 44% of the surveyed households. 63% of the respondents use cotton seed cake as additional nutritional source for the cattle. None of the respondents mentioned alfalfa as a type of fodder they could use for their animals, since they don't grow it (Table 4).

Table 4. Fodder types used by the surveyed households

House-hold	Wheat straw	Rice straw	Maize stem	Sorghum stem	Maize grains	Sorghum grains	Cotton seed husk	Cotton seed cake	Wheat bran (husk)	Rice husk	Alfalfa	Grass near lakes
number	22	6	16	12	10	2	1	17	27	4	0	3
share, %	81%	22%	59%	44%	37%	7%	4%	63%	100%	15%	0%	11%

4.4.2 The most important fodder

The surveyed households reported wheat straw to be the most important fodder for their livestock (44% of the respondents). Green fodder maize and sorghum came next at the importance scale after wheat straw (30% and 22% respectively). Cotton seed cake or husk are important fodder type for 41% of the respondents. Grass near the lake is not only used by rare households (due to various reasons) but is also not important for all of the surveyed households (Table 5).

Table 5. Fodder types by importance

House-hold	Wheat straw	Rice straw	Maize stem	Sorghum stem	Maize grains	Sorghum grains	Cotton seed husk	Cotton seed cake	Wheat husk	Rice husk	Alfalfa	Grass near lakes
number	12	1	8	6	1	0	0	6	5	0	0	0
share, %	44%	4%	30%	22%	4%	0%	0%	22%	19%	0%	0%	0%

4.4.3 Source of the fodder

With regards to where fodder could be acquired by the surveyed households, the most frequent answers in connection to all fodder types were: (1) produced on own household plots (wheat straw-74%, green maize and sorghum – 77%, maize and sorghum grains – 22%, wheat husk – 81%); (2) purchased at local market mainly for cotton by-products and wheat husk. None of the surveyed households purchased any type of fodder from neighbours, relatives, from the sellers in the street or collected either at farmers' fields or near the lake (Table 6).

Table 6. Fodder source by type of fodder

Source	Wheat straw	Rice straw	Maize stem	Sorghum stem	Maize grains	Sorghum grains	Cotton seed husk	Cotton seed cake	Wheat husk	Rice husk	Alfalfa	Grass near lakes
Produced on own household plot	74%	4%	44%	33%	15%	7%	0	0	81%	4%	0	0
From neighbors/relatives	4%	0	0	0	0	0	0	0	0	0	0	0
From local farmers	4%	0	0	0	0	0	0	0	0	0	0	0
Purchased at the local market	30%	19%	19%	15%	22%	4%	4%	63%	56%	11%	0	0
Purchased from sellers in the street	0	0	0	0	0	0	0	0	0	0	0	0
Went and harvested myself	0	0	0	0	0	0	0	0	0	0	0	0
Near lake	0	0	0	0	0	0	0	0	0	0	0	11%

4.4.4 Typical price and annual expenditure for the purchased types of fodder

Table 7 presents the average prices paid by the surveyed households for the purchased fodder by type of fodder. Most expensive fodder for the households is cotton seed husk, priced at 1,600 soum per kg, least expensive (but also mostly applied) is wheat straw, priced at 224 soum per kg.

Table 7. Prices by type of fodder, UZS per kg

Price, Soum/kg	Wheat straw	Maize stem	Sorghum stem	Maize grains	Cotton seed cake	Wheat husk	Rice husk	Cotton seed husk	Rice straw
average	224	743	240	1100	740	755	1150	1600	n/a
max	250	1000	300	1200	1000	1000	1500	1600	n/a
min	200	170	200	1000	600	500	800	1600	n/a
mode	200	1000	200	1200	800	700	n/a	n/a	n/a

As seen from Table 8, surveyed households would spend on average 326,500 soum for purchasing green maize, 240,000 for purchasing cotton seed husk, the least would be spent on wheat straw, because of its low price. Table 8. Annual expenses by type of fodder, UZS per kg

Table 8. Total expenses spent on fodder, UZS per kg

Expenditure (soums)	Wheat straw	Maize stem	Sorghum stem	Maize grains	Cotton seed cake	Wheat husk	Cotton seed husk
average	86227	326500	170000	215000	204818	204818	240000
max	200000	600000	360000	360000	480000	600000	240000
min	20000	102000	90000	100000	32000	25000	240000

4.5 Households' energy sources for heating and cooking

The general trend in the country is towards decreasing the use of non-renewable energy resources especially by the population, including in rural areas. Supply of natural gas has been decreasing a lot, became very unstable and is expected to be reduced to the minimum in the coming future. The cases of energy supply deficits became widespread and the population is forced to look for alternative energy sources for cooking and heating the houses. In many if not all the cases, the households use several energy sources in order to diversify the risk of no energy supply and to lower the costs.

4.5.1 Available energy sources

Several types of energy resources somehow available and used by the surveyed households have been identified and grouped in Table 9. While none of the respondents reported to use kerosene, diesel and gasoline for cooking or heating purposes, cotton stems were reported to be used by 100% of the households, 81% of households rely on natural gas, 63% use mostly fuelwood, 26% use liquid gas as an alternative energy source for cooking purposes, another 26% use charcoal but mainly for heating, still 22% of the surveyed households, those who have several cattle, use manure (dried) for heating their houses (Table 9).

Table 9. Available energy sources for the surveyed households

House-hold	LPG	Kerosene	Diesel	Gasoline	Natural gas	Charcoal	Fuelwood	Cotton stem	Grass near the lake	Manure
number	7	0	0	0	22	7	17	27	2	6
share, %	26%	0	0	0	81%	26%	63%	100%	7%	22%

It has to be mentioned once more that one household can use several energy sources for different purposes, for example, cotton stems are used a lot for cooking, whereas the same household would use charcoal for heating, etc.

4.5.2 Primary sources of energy separately for cooking and heating

Specifically for cooking purposes the surveyed households rely mostly on natural gas – 70% of the respondents (if there is central supply, and we have to say that the village Ortayap has been lucky to have their countryman in the high administration in Tashkent, who takes care of the village in terms of paving the roads and ensuring stable central supply of natural gas. Many other villages do not get stable gas supply and have to cook on other energy sources.) 44% of the surveyed households use cotton stems (Table 10), 26% use liquid gas, in many cases households would use the mixture of energy sources.

Table 10. Energy sources used for cooking

Household	LPG	Natural gas	Charcoal	Fuelwood	Cotton stem	Grass near the lake	Manure
number	7	19	0	0	12	0	0
share, %	26%	70%	0	0	44%	0	0

With regards to the reliable and primary energy sources for heating surveyed households rely mostly on natural gas (74%) or fuelwood (56%) (Table 11).

Table 11. Energy sources used for heating

Household	LPG	Natural gas	Charcoal	Fuelwood	Cotton stem	Grass near the lake	Manure
number	0	20	4	15	1	0	0
share, %	0	74%	15%	56%	4%	0	0

4.5.3 Where does energy come from and how much it costs

Each type of energy has its own source. Natural gas is of course supplied centrally via gas pipes, liquid gas is purchased by the respondents at special gas stations either in Urgench or in Khiva, so only those households which have transportation means can afford using liquid gas. Manure is not traded, so those households (really poor ones) which use manure for heating have it produced by own cattle. Cotton stems and fuelwood are either collected/harvested by the respondents themselves either from the street, from the farmers' fields or from own land plots. In many cases respondents buy fuelwood or cotton stems from the small traders walking in the street with the carriages or carts.

In summary, all energy sources used by the surveyed households for cooking or heating, besides cotton stems (which partly can be produced by the households) are purchased for money.

It was identified via the survey, that annually households in the surveyed village spend on average 420 thousand soum on liquid gas, 246 thousan soum on natural gas, 750 thousand soum on charcoal, 847 thousand soum on fuelwood and 333 thousand on cotton stems (Table 12).

Table 12. Annual costs for purchasing energy by the surveyed households

Indicator	LPG	Natural gas	Charcoal	Fuelwood	Cotton stem
Households, number	6	17	5	14	12
average	420833	246776	750000	847143	333333
max	700000	912000	2500000	2000000	600000
min	180000	45600	100000	270000	200000

4.6 Access to energy resources

Access to fuel is a critical issue in rural areas. Households were asked to assess the level of fuel availability for them.

4.6.1 Opinions on the access to fuel

Less than third of the respondents are satisfied with the amount of fuel available for cooking and twice as less of respondents are content with the fuel access for heating. The majority of the households (81%) experience shortages with energy supply (Table 13). Supply of natural gas is limited in surveyed area: as one respondent said, there was a 1000 m^3 limit on the supply of natural gas for rural households. Whereas about one third of the respondents is satisfied with the amount of energy resources for cooking (as many types of resources can be easily used for cooking), only 15% of the respondents are satisfied with the available resources for heating purposes.

Table 13. Satisfaction with energy supply

Household	Are you satisfied with the amount of fuel you access for cooking?	Are you satisfied with the amount of fuel you access for heating?	Does your household experience fuel shortages?
number, yes	8	4	22
share, %	30%	15%	81%

4.6.2 Frequency of purchasing energy resources

In order to offset and alleviate energy shortages, households purchase energy resources for cooking and heating. Most of the households buy them for cooking and heating only once a year. They buy fuelwood and cotton stems in bulk from local farmers and sellers. In contrast to purchasing fodder, the frequency of which depends on the financial capacities of the surveyed households and is quite frequent (for many households every week for example), purchasing of energy resources for cooking or heating happens once or twice in a year (because households buy a bulk of stems or fuelwood at once). Those households, that use LPG, have to go to Urgench or Khiva several times a year (up to 3 times) to fill their gas balloons.

4.6.3 Members, responsible for supplying households with energy resources

Children are not involved in procuring energy resources to home. In most of the households male adults are responsible for buying energy resources both for cooking (85%) and heating (63%), since it is a rather laborious task (Table 14).

In general, there is a huge problem with energy supply not only for surveyed households, but also for the whole community. And this problem becomes extremely acute during winter. So, households have to reserve significant amount of cash (if available) for purchasing of alternative sources of energy to survive in cold months.

Table 14. Responsible members of households for energy resources supply

	Energy resources for cooking		Energy resources for heating	
Member	Number	Share, %	Number	Share, %
Female children	0	0%	0	0
Male children	0	0%	0	0
Female adults	4	15%	3	11%
Male adults	23	85%	17	63%

4.7 Crop cultivation

Crops are vital for households to survive in rural areas. Households were asked various questions regarding types of cultivated crops, importance level of these crops for their households, harvests and the degree of satisfaction with their harvest, etc.

4.7.1 Crop cultivation

Data shows that almost all households cultivate wheat on their allocated plots. Maize is the second widespread crop, which is preferred by 67% of the respondents. Only one surveyed household has an opportunity to cultivate rice, since it is not allowed in general due to water shortages. Maize and sorghum are cultivated on the same land plots right after wheat (cover crops). Vegetables, fruits and melons are cultivated on small plots (average 200 m^2) nearby the houses, though melons are not that widespread as two other mentioned crops (Table 15).

Sunflower, alfalfa and tobacco are not cultivated by the surveyed households in the given mahalla. It needs to be stressed once more, that almost all surveyed households produce crops for home consumption and not for sale.

Table 15. Crops grown by the surveyed households

Households	Wheat	Rice	Maize	Sorghum	Sunflower	Vegetables	Melons	Fruit trees	Alfalfa	Tobacco
number	26	1	18	5	0	27	7	26	0	0
share, %	96%	4%	67%	19%	0	100%	26%	96%	0%	0%

4.7.2 Importance of cultivated crops to the households

Wheat is the most valuable crop for the surveyed households. Wheat products are the sources of food for the family and fodder for the animals. Vegetables considered the second most important crop, because it is a vital source of food for family. Maize is also considered second important crop, but for feeding animals. According to the surveyed households third at the importance scale come fruit trees (Table 16).

Table 16. Rating of crops

Importance	Wheat	Rice	Maize	Sorghum	Vegetables	Melons	Fruit trees
1	96%	0	4%	0	4%	0	0
2	0	4%	30%	7%	56%	0	4%
3	0	0	7%	4%	41%	0	37%

4.7.3 Reason for crops cultivation, harvests, satisfaction with harvests

There are two main reasons, which respondents indicated, for cultivation of certain crops. Naturally, households cultivate wheat, rice, vegetables, melons and fruits for own consumption. Maize and sorghum are cultivated for feeding animals. As mentioned already no cash crops are grown neither for sale at markets, nor for exchange with neighbours or relatives (Table 17).

Table 17. Rating of crops according to the importance level

Reason	Wheat	Rice	Maize	Sorghum	Vegetables	Melons	Fruit trees
For own consumption	96%	4%	0	0	100%	26%	93%
For feeding own animals	0	0	59%	19%	0	0	0
For using as fuel	0	0	0	0	0	0	0
To earn money from selling	0	0	0	0	0	0	0
For exchanging with neighbors	0	0	0	0	0	0	0
For improving land quality	0	0	0	0	0	0	0
My household has no other alternatives/no other crop suits the quality of my household land	0	0	0	0	0	0	0

Data on harvests by cultivated crop is given in Table 18. What is more important is the degree of satisfaction of households with crop harvests. Nearly half of the respondents are not really content with their wheat harvest. Though, more than a third of the respondents deem wheat harvest as satisfactory, and only 7% - as good (Table 19). The same trend is observed for other crops as well: most of the households consider crops harvests level as poor or even very poor. The main reason for this dissatisfaction is a low quality of available land - it is usually highly saline and almost all households do acknowledge this problem.

Table 18. Average crop harvests, kg per 1200 m^2

Harvest, kg	Wheat	Rice	Maize	Sorghum	Vegetables	Fruit trees

Household, number	26	1	14	3	27	11
Mean	483	600	1079	767	167	83
Max	1000	600	1800	800	800	250
Min	100	600	500	700	10	0

Table 19. Rating of harvests

Rating	Wheat	Rice	Maize	Sorghum	Vegetables	Fruit trees
Very poor	15%	0	0	0	0	19%
Poor	37%	0	22%	4%	63%	37%
Satisfactory	37%	0	26%	7%	30%	22%
Good	7%	4%	4%	0	7%	19%
Excellent	0	0	0	0	0	0

4.7.4 Crops for sale, purchased crops

None of the households sells own crop products, except for one household that sells vegetables at a local market (Table 20).

Table 20. Crops for sale by the surveyed households

Households	Wheat	Rice	Maize	Sorghum	Vegetables	Melons	Fruit trees
number	0	0	0	0	1	0	0
share, %	0	0	0	0	4%	0	0

Since cultivated crops are not enough to meet households' demands, they have to purchase necessary amounts and varieties of crops. Almost all respondents buy additional wheat, rice, vegetables, fruit, and melons (Table 21). The share of the purchased crops in total consumption is given below.

Table 21. Crops purchased by the surveyed households

Households	Wheat	Rice	Maize	Sorghum	Sunflower	Vegetables	Melons	Fruit trees	Alfalfa	Tobacco
number	24	26	3	1	0	24	24	25	0	0
share, %	89%	96%	11%	4%	0	89%	89%	93%	0	0

This table 22 groups surveyed households by shares of purchased crops in total consumption. All households buy at least 50% of all food crops. Since only one household cultivates rice, all other households purchase 100% of rice.

Table 22. Share of purchased crops in total consumption

Share, %	Wheat	Rice	Maize	Sorghum	Vegetables	Melons	Fruit trees
0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	4%
20	4%	0	4%	0%	4%	0	0
30	0	0	4%	0%	0	0	0
40	0	0	0	0	0	0	0
50	33%	0	4%	4%	22%	0	30%
60	15%	0	0	0	11%	4%	0
70	11%	0	0	0	15%	7%	7%
80	11%	0	0	0	26%	0	19%
90	11%	0	0	0	11%	4%	11%

100	4%	96%	0	0	0	74%	22%

4.7.5 Source of the crops purchase

All households, that purchase crops, buy them at the local market (Table 23), which functions one day a week. Though, only one household buys wheat from local farmers.

Table 23. Where households buy additional crops

Source	Wheat	Rice	Maize	Sorghum	Vegetables	Melons	Fruit trees
From neighbors / relatives	0	0	0	0	0	0	0
From local farmers	4%	0	0	0	0	0	0
Purchase in the local market	89%	96%	11%	4%	89%	89%	93%
Purchase from sellers in the street	0	0	0	0	0	0	0
Went and harvested myself	0	0	0	0	0	0	0

4.7.6 Additional land for households and reasons for cultivating it

Most of the respondents (63%) are willing to cultivate a larger land (mainly in the form of additional land plots for dehqons) if this is possible. Most of the households need a larger land for satisfying their own consumption demand. About one fifth of the respondents wish to use that larger land to earn additional cash from selling crops, and to get fodder for own livestock.

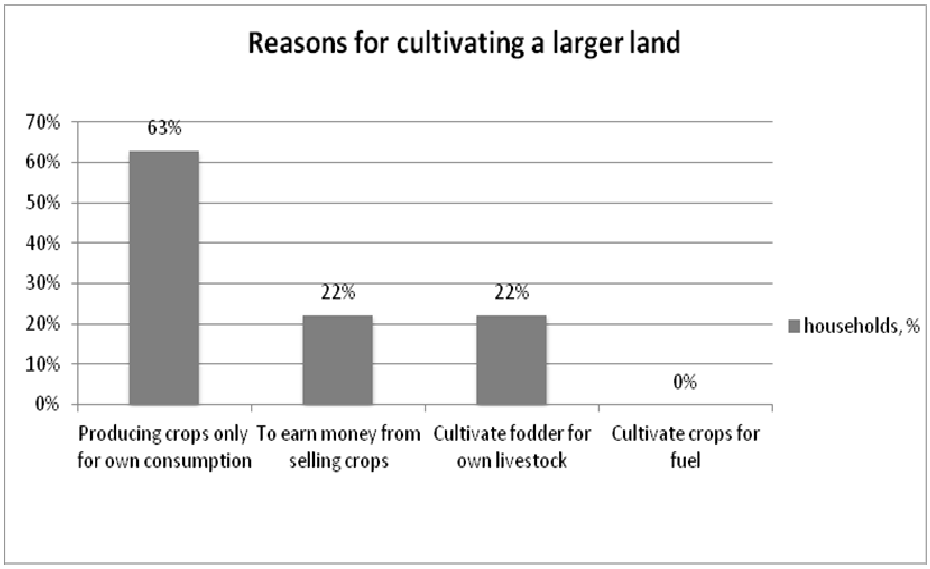

Figure 12. Reasons for potential cultivation of additional land plots

4.7.7 Three main reasons for not willing to cultivate a larger land

Some households refused to have a larger land due to several reasons. The main reason is that there is no good land available even if they want a larger plot. Another reason is the shortage of water supply in the surveyed area. Several households said that they don't have enough money as well as labor for cultivating a larger land.

Table 24. Reasons of unwillingness to cultivate additional land plots

Reasons	Reason 1	Reason 2	Reason 3
My household does not have enough labor	7%	4%	0

My household does not have enough skills for operating larger land	0	0	0
My household knows how to operate larger land, but we do not want because operating larger farms is too complicated	0	0	0
My household does not know how to sell crops	0	4%	0
My household does not have enough money	4%	4%	11%
There is not enough water in neighborhood for irrigating larger land	7%	19%	4%
There is no good land in neighborhood	15%	0	0%
My household does not have access to dekhqan markets to sell products	0	0	0
Other (poor health)	4%	0	0

In summary, surveyed households complained mostly about low quality of the cropland and most of them don't know how to improve it. Some households tried to use manure and fertilizers but without significant positive result. Though, there are few households that managed to receive higher yields in their cropland applying combination of fertilizers and land treatment (more machinery services), but it requires cash investments, which most of the households can't afford.

Another major complain regarding crops is water supply shortage, and there is almost nothing they can do about it.

4.8 Grass near lake

This section elaborates on the attitude of the households toward the grass grown near the lake. Nowadays, lake is a private property of one local person and this influenced responds of the households.

4.8.1 Ownership of the lake as a factor for change[1]

In Uzbekistan, all land including lakes and the land surrounding them are the property of the state and can only be leased by individual farmers or fishery enterprises. To lease a lake for fishery purposes, competitions are conducted between different fishery enterprises and the lease is granted based on a decision made by the district/province khokim and his administration. By entering a lease contract, the leaseholder becomes responsible for fulfilling a number of duties such as rational use of the lake, adequate management of its fish stocks and fertility, provision of information on its use to state authorities, compliance with nature protection legislation, and payment of rent/tax. If the duties are not fulfilled, the leaseholder can be fined and the lake lease can be taken away from him/her. A leaseholder of a lake cannot sell or sublease the whole lease or parts of it. He/she has the right to access, use and manage lake resources, but not to grant these rights to others because there is no exclusion or alienation rights in the sense of Ostrom/Schlager (1996) (RoU 2004a, RoU 2004b, RoU 1998).

Until around 5 years ago Shurkul Lake has never been leased by a farmer or an enterprise. An interview with local authorities suggests that there has been little interest to lease the lake because potential candidates seem discouraged by the responsibilities that come with a lease contract. In addition, the Lake's location at the tail end of the irrigation network and the risk of water scarcity did make it an unattractive lease. So, the lake was considered common property of

[1] This subchapter was extracted from Oberkircher, 2010

the residents of the adjacent village Ortayap. All people were allowed to use the lake resources and many commonly did so by fishing, grazing cattle and using the vegetation as fodder and building material. The lake landscape thus formed part of their subsistence farming system.

Shurkul Lake has a potential for aquaculture, which in general has been identified as potentially very profitable in Khorezm given the availability of cheap, local inputs such as fish feed, and much of the Khorezm region is suitable for aquaculture based on economic and ecological considerations. Furthermore, it was estimated that production of fish is 3 times more profitable than cotton production and almost 30% more profitable than wheat on the same land.

It was revealed during the survey that after 5 years from ZEF/UNESCO project research the Shurkul Lake is now the property of Mr X. The respondents during the survey said the Lake belongs now to somebody, who has relatives in the regional administration. Thus it has been prohibited in the last 3 years to openly catch fish, collect reeds or graze the cattle near the Lake. The household living in close vicinity to the lake can no longer plant the fields with rice, or vegetables near the lake like 3 years ago. So the local population of course suffers from the 'ownership' of the lake, despite that nobody have seen the official documents. On the contrary, the new 'owner' of the lake fishes and sells around 150 kg of fish every day in the peak season. Given the average price of 10,000 soum per 1 kg of fish, the 'owner' can make up to 1.5 mln. soum of profit every day!

This unclear ownership of the lake makes the residents, households very indifferent to the status of the lake, to what is grown on the lake shores (normal crops of halophytes), to the salinity and soil degradation problems in the village.

4.8.2 Opinion on the grass near the lake and its importance

Table 25. Info on the grass use from the lake

Household	Do you harvest grasses growing near the lake? (Yes=1; No=0)	If yes, do you use them as fuel for cooking or heating? (Yes=1; No=0)	Do you give them as fodder to your animals? (Yes=1; No=0)	Do you store them over winter? (Yes=1; No=0)	Do you think the amount of grass is sufficient near the lake? (Yes=1; No=0)	Would you be interested if this grass was planted near the lakes? (Yes=1; No=0)	Would you be willing to pay for this grass if a farmer or other organization cultivates it and sells? (Yes=1; No=0)
number	1	1	1	1	9	13	12
share, %	4%	4%	4%	4%	33%	48%	44%

Only one household harvests grass that grows near the lake and uses it firewood. Previously however, reed growing on the lake was used for construction purposes (covering the roofs of the houses). Other respondents said that they didn't have access to that grass, since the owner of the lake doesn't allow that. Only one third of the respondents think that there is sufficient grass near the lake, though this is an estimate. Nevertheless, almost half of the respondents are interested and willing to pay for the grass that improves land quality (Table 25).

Well, the chart below does say it all clearly: except for one all other households deny the importance of the grass the near the lake, since they don't have an access to it.

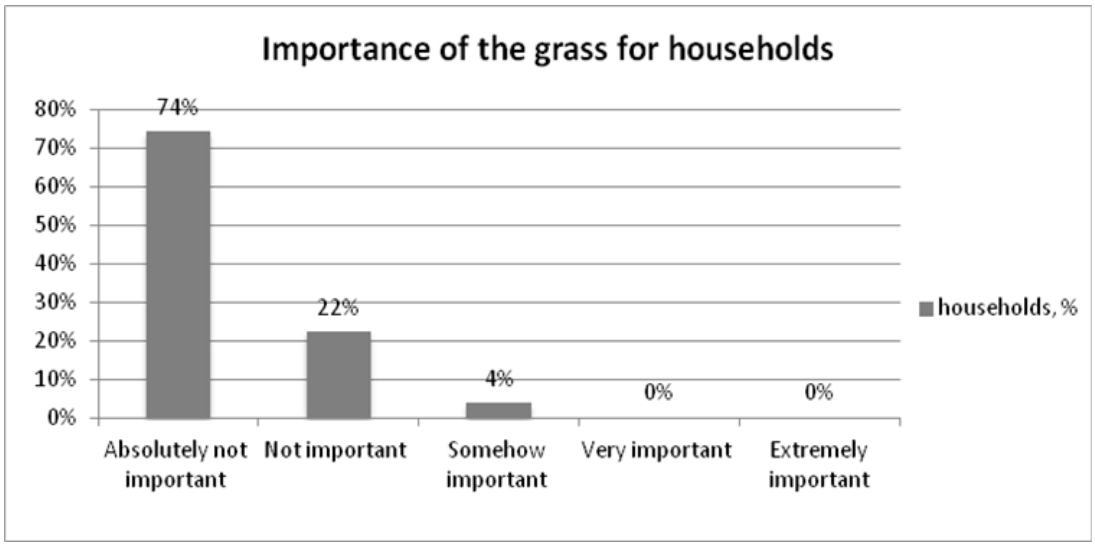

Figure 13. Importance of grass from the lake for the respondents

4.8.3 Opinion on who should plant the grass

About 40% of the respondents share the opinion that they should plant the grass, involving local community (Figure 14). One household thinks that local administration should be responsible for planting the grass. Few households prefer when foreign organizations and Urgench State University lead this process. Another share of respondents lays all responsibility for growing the grass on the current owner of the lake.

In summary, grass near the lake has no effect on the lives of the surveyed households.

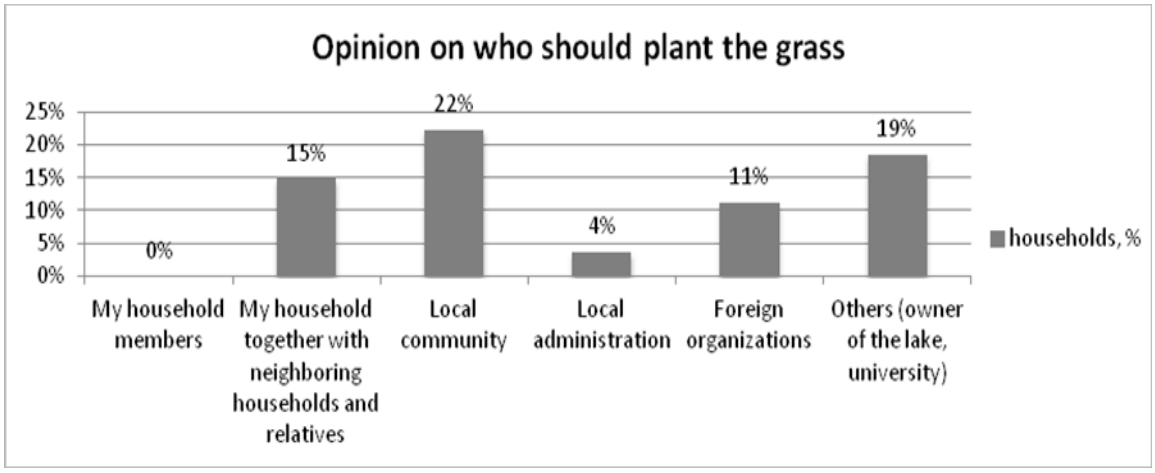

Figure 14. Who should plant the grass at the lake

4.9 Households' income structure and sources of income

The rural households in Uzbekistan are net buyers of food products, particularly of wheat, which has the largest contribution to their energy intake. The annual wheat production of an average household in Khorezm covers only around 30% of its annual consumption requirements (Djanibekov, 2008). As household income depends to a large extent on agricultural production and also as the largest share of the budget is spent on food consumption price fluctuations will

have a strong effect on the level of both production and consumption, and thus on the households' overall welfare.

This section describes income and expenditure structures of the surveyed households. It should be noted, that most respondents unwillingly answered questions related to their income, especially regarding income amounts.

Following two tables give information on the available sources of income and their importance for households.

There are various sources of income for the surveyed households. Members of more than half of households (67%) are employed or work seasonally in other farms (Table 26). But it is a primary source of income only for one household, since salary in farms is mostly paid with cotton byproducts (cotton stems) plus money for cotton pick-up, which is about 200,000 Uzbek soums. Six households receive income from selling own produced crop and animal products, but only for two of them this income is a main source. Pensions as an income are present at 30% of households and considered as a primary income source at 19% of households. Members of about third of households (30%) receive salary from employment at education sector (school), but this is a major income only for one household (4%). Remittances from household members working abroad exist in about quarter of the households (26%) and are a major income source for almost all of them (22%). In eleven (41%) households members do private work as seasonal workers (construction) and this income is a primary source for 9 (33%) of them (Table 27).

Table 26. Income sources of the surveyed households

Income source	Households, number	Households, %
Selling own produced crop products	2	7%
Selling own produced animal products	4	15%
Salaries from work in other farm fields and employment in farms	18	67%
Pensions	8	30%
Stipend	1	4%
Remittances from household members working abroad	7	26%
Salaries from work in governmental organizations	0	0
Salaries from work in MTP, WUA or farmers association	1	4%
Salaries from employment in education sector, including kindergartens	8	30%
Salaries from employment in public health service, in hospital, in poliklinika	1	4%
Income from own private business not related to agriculture (private worker in construction)	11	41%
Income from running own farm	0	0

Table 27. Primary income sources of the surveyed households

Income source	Households, number	Households, %

Income from selling own produced crop products	1	4%
Income from selling own produced animal products	1	4%
Salaries from work in other farm fields and employment in farms	1	4%
Pensions	5	19%
Stipend	0	0
Remittances from household members working abroad	6	22%
Salaries from work in governmental organizations	0	0
Salaries from work in MTP, WUA or farmers association	1	4%
Salaries from employment in education sector, including kindergartens	1	4%
Salaries from employment in public health service, in hospital, in poliklinika	1	4%
Income from own private business not related to agriculture (private worker in construction)	9	33%
Income from running own farm	0	0

In summary, incomes from working abroad (remittances) and seasonal construction work have the largest effect for households living.

4.10 Households expenditure structure

Analysis of the expenditures shows that all households spend the largest share (from 30% up to 70%) of their income on food consumption. Expenditures on fuel are the second largest item (up to 30%) in the budget of the households. Costs for cultivating land vary on average from 5% to 10% for most households; the same is true for costs on taking care of the livestock. Expenditures on education include costs for children studying at schools, colleges and university: on average these costs take up from 5% to 10% of the annual income. Expenditures on cloth don't exceed 10% for the majority of households, as well as costs on hygiene and other (medicine, primarily) costs usually don't exceed 5% of the budget of the households (Table 28).

Table 28. Primary income sources of the surveyed households

Share of income, %	Food consumption (at home and outside)	Purchasing and repairing clothes	Buying things for hygiene	Money spent for education	Purchase of fuel for heating and cooking	Expenditures for cultivating crops on own plots	Expenditures for feeding and taking care of own livestock	Other important expenditure
0	0%	0%	0%	41%	7%	4%	4%	48%
1 to 5	0%	37%	89%	30%	15%	48%	48%	44%
6 to 10	0%	52%	4%	26%	56%	44%	44%	4%
11 to 20	0%	11%	7%	4%	19%	0%	4%	4%
21 to 30	0%	0%	0%	0%	4%	4%	0%	0%
31 to 40	19%	0%	0%	0%	0%	0%	0%	0%
41 to 50	26%	0%	0%	0%	0%	0%	0%	0%
51 to 60	52%	0%	0%	0%	0%	0%	0%	0%
61 to 70	4%	0%	0%	0%	0%	0%	0%	0%

From the analysis of the income and expenditures structure we can see that, surveyed households hardly make any savings due to low income.

Conclusions

Institutional frame conditions are important to study and consider since a change in land use policies of marginal land may be necessary to implement some options. The institutional settings must be screened for their role in providing direct economic benefits to rural households, income for the government via taxes, and lead to an overall improvement in ecological conditions in the region.

The general trend observed during the survey with regards to livestock is that rural households keep bulls as an economic asset or income source, easily marketable in case of necessity (social events like weddings, or funerals, or for supporting educational (university) fees of the children in the household). Cows are kept (at least 1 cow per household) for home consumption of diary products. Poultry is kept by virtually all households in the rural area for home consumption as a source of meat and eggs. Sheep was observed in a quarter of the households, which have 'free' labor force (teenagers at high school) to graze the sheep in the surrounding fields or canals. The main source of fodder for most of the cattle is home produced crops (maize for fodder, alfalfa, wheat bran). In case of fodder shortage, surveyed households purchase the required amounts of mainly cotton husk for cattle and wheat bran or maize grain for poultry at the local market, which is located 1-1.5 km from the surveyed mahalla.

In summary, all energy resources used by the surveyed households for cooking or heating, besides cotton stems (which partly can be produced by the households) are purchased for money.

The majority of households experience lack or shortages in energy resources supply and are not satisfied with the access to energy resources. Natural gas supply is limited and very unstable. Households have to spend time and money to get cotton stems, fuelwood, LPG, and charcoal to minimize this issue as much as possible.

Crop cultivation is an essential part of the rural lifestyle. Though, most of the households are not satisfied with the crop yields, due to low quality of the land and water shortages, wheat and maize serve as a primary source for households' consumption and animal fodder. However, crop yields are below normal, and households have to purchase crop products from local market to meet their consumption demand and replete fodder stocks. That's why more than half of the households would like to have additional land plots (usually 2400 m^2, twice more than current land size) to secure their consumption needs.

A local person owns the lake and he doesn't allow nearby people to use grass near the lake. This fact brings about indifference among households towards the grass near the lake, which doesn't have any impact on their lives.

There are very few jobs available in the community. Most people are employed by farmers or do seasonal work at farms, cultivating cotton. Though, this activity doesn't generate much income: people get paid with cotton by-products, such as cotton stems. Primary source of income for most of the surveyed households are temporary works at construction sites and remittances from abroad. Households felt uncomfortable to reveal real annual income values in order not to have possible issues with tax bodies. Most of the budget of households is spent on food consumption with expenditures on fuel being the second most common item.

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Annexes

Annex 1. Questionnaire for Socio-economic survey (original, in the English language)

HOUSEHOLD SURVEY QUESTIONNAIRE
Utilization of low quality water for halophytic forage and renewable energy production

A) Respondent's name _____

B) Interview started time _____

C) Rayon _____

D) Village _____

E) Address (brigade, street, house number) _____

I. GENERAL INFORMATION ABOUT HOUSEHOLD

1) What is the size of your household plot (sq. meters) _____
2) What is the distance from your house to the nearest dekhqan market? (meters) _____
3) How many people does your household comprise including temporarily migrated? _____

4)

N	Name of the household member	Gender (M=1, F=2)	Age (number of years)	His/her highest level of education **(Code 1)**	Which of the following categories describes current occupation most accurately? **(Code 2)**	Does this household member participate daily in production of crops in your household plot?	Does this household member participate daily in taking care of animals in your household plot?
	1	2	3	4	5	6	7
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							

Code 1 Level of education

1.a Primary school (finished after 9th grade)
1.b Incomplete secondary school
1.c Secondary school
1.d College, technical school, academic lyceum
1.e Incomplete graduate
1.f Higher education

Code 2 Current occupation

2.a He/she is a child and goes to Kindergarten or stays at home
2.b He/she goes to school, studies at school, at technical college, lyceum
2.c He/she goes to institute, university
2.d Pensioner
2.e Housewife
2.f Disabled, does not have capacity to work
2.g Unemployed and doesn't receive a salary
2.h Runs own private farm business
2.i Runs own business
2.j Employed as a worker at another farm
2.k Works as a seasonal worker at another farm
2.l Works in MTP, association of private farms, water user association
2.m Works in commercial / private firm
2.n Works in educational sector, including kindergartens
2.o Works in public health service, in hospital, in poliklinika
2.p Works in the administrative bodies/ in government, for instance in khokimiat
2.q Other (Specify_____)
2.r Other (Specify_____)
2.s Other (Specify_____)

II. LIVESTOCK

5)

N	Animals	Does your household have these animals (Yes=1; No=0)	How many of this animal does your household currently have? (quantity)	What is the main source of feed for this animal in your household? (**Code 3**)	What is the second main source of feed for this animal in your household? (**Code 3**)	Do you keep this animals for own consumption or for selling it and its products? (Own consumption=1; Selling=2)	If yes, where do you sell the animal products? (**Code 4**)
	1	2	3	4	5	6	7
1	Bull						
2	Cow						
3	Calf						
4	Sheep						
5	Goat						
6	Poultry						
7	Donkey						
8	Horse						

Code 3 Source of livestock feed

3.a Grazing near canals and in the fields
3.b Grazing near the lake
3.c Grazing in the flat land
3.d Give crops produced in own household plots
3.e Give crops received for working in farm fields
3.f Give grass harvested near the lake
3.g Give purchased crops
3.h Other (Specify _____)

Code 4 Marketing of livestock products

4.a Sell near own house
4.b Visit neighbors and sell to them
4.c Give to local store for selling
4.d Take and sell in the local market
4.e Sell to sellers in the street
4.f Other (Specify _____)

III. OPINIONS ON ACCESS TO FODDER SOURCES

6) Does your household experience fodder shortages for animals? (Yes=1, No=0)_____

7) Are there fodder shortages during a year? (Yes=1, No=0) _____

8) In which moths usually these fodder shortages occur? _____

9) How often do you buy fodder during one year? _____

10) How much time do you spend to bring fodder one time? _____

11) How far is the place where you commonly bring the fodder? (meters) _____

Code 5

5.a Female children
5.b Male children
5.c Female adults
5.d Male adults

12) Who in your household is responsible for bringing fodder? (**Code 5**) _____

IV. HOUSEHOLD'S SOURCES OF ANIMAL FODDER

13)

N	Fodder	Does your household use this type of fodder for feeding livestock? (Yes=1, No=0)?	Which of these fodders is the most important for your household animals? (Put 1 next to it)	Where do you get this fodder? (**Code 6**)	How many kg of this fodder does your household usually produce on his own plots? (kg)	How many kg of this fodder does your household use during one year? (kg)	What is the share of the amount of this fodder used during one year does your household purchase? (%)	What is the typical price your household pays per kg of this fodder this year? (Soums)	During one year, what is approximately the total expenditure for this fodder that your household purchases? (Soums)	How much time do your household members spend to collect this fodder? Include time spent purchasing and collecting, as well as round-trip travel (hours)	What is the one-way distance members of your household typically travel to collect/ purchase this fodder? (meters)
	1	2	3	4	5	6	7	8	9	10	11
1	Wheat straw										
2	Rice straw										
3	Maize stem										
4	Sorghum stem										
5	Maize grains										
6	Sorghum grains										
7	Cotton seed husk										
8	Cotton seed cake										
9	Wheat husk										
10	Rice husk										
11	Alfalfa										
12	Grass near lakes										
13											

Code 6 Source of fodder

6.a Produced on own household plot
6.b From neighbors/relatives
6.c From local farmers
6.d Purchased in the local market

6.e Purchased from sellers in the street 6.f Went and harvested myself 6.g Others (Specify_____)

V. HOUSEHOLD'S SOURCES OF FUEL FOR HEATING AND COOKING

14)

N	Fuel source	Does your household use this type of fuel? (Yes=1, No=0)?	Which of this fuel is your primary fuel for cooking? (Put 1 next to it)	Which of this fuel is your main fuel source for heating? (Put 1 next to it)	Where do you get this fuel? (**Code 7**)	What is the name of the unit of this fuel? (write name in cells)	How many units of this fuel does your household usually need during one year? (units)	What is the share of this amount used during one year does your household purchase? (%)	What is the typical price your household pays per unit of this fuel this year? (Soums)	During one year, what is the total annual expenditure for purchasing this fuel? (Soums)	How much time do your household members spend to collect this fuel? Include time spent purchasing and collecting, as well as round-trip travel? (hours)	What is the one-way distance members of your household typically travel to collect/ purchase this fuel? (meters)
	1	2	12	13	8	3	4	5	6	7	9	10
1	LPG											
2	Kerosene											
3	Diesel											
4	Gasoline											
5	Natural gas											
6	Charcoal											
7	Fuelwood											
8	Cotton stem											
9	Grass near lakes											
10	Dung											
11												

Code 7

7.a Produced on own household plot
7.b From neighbors/relatives
7.c From local farmers
7.d Purchased in the local market
7.e Purchased from sellers in the street
7.f Went and harvested myself

7.g Others (Specify_____)

VI. OPINIONS ON ACCESS TO FUEL SOURCES

15) Are you satisfied with the amount of fuel you access for cooking? (Yes=1, No=0)_____

16) Are you satisfied with the amount of fuel you access for heating? (Yes=1, No=0) _____

17) Does your household experience fuel shortages? (Yes=1, No=0) _____

18) In which months usually these fuel shortages occur? (name of months) _____

19) How often do you buy fuel for cooking during one year? (number of times) _____

20) How often do you buy fuel for heating during one year? (number of times) _____

21) How much time do you spend to bring fuel for cooking one time? (hours) _____

22) How much time do you spend to bring fuel for heating one time? (hours) _____

23) Who in your household is responsible to bring fuel for cooking? (**Code 8**) _____

24) Who in your household is responsible to bring fuel for heating? (**Code 8**) _____

25) Does your household have and use any power generator? _____

Code 8

8.a	Female children
8.b	Male children
8.c	Female adults
8.d	Male adults

VII. CROP CULTIVATION

26)

N	Crops	Does your household cultivate these crops in your plot? (Yes=1; No=0)	Cultivation of which three crops are the most important for your household? (Put 1-3 depending on the importance)	What is the area of cultivation? (sq. meters)	Why do you cultivate this particular crop? (**Code 9**)	How many kg does your household harvest from own plots? (kg)	How would you rate the yield of this crop? (**Code 10**)	Which of these crops does your household sell during one year? (Put 1)	What is the share of this amount produced on own plots does your household sell? (%)	Where do you sell these crops? (**Code 11**)	Which of these crops are necessary to get or buy during one year?	What is the share of this amount needed for one year does your household purchase or receive? (%)	Where do you get these crops? (**Code 12**)
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Wheat												
2	Rice												
3	Maize												
4	Sorghum												
5	Sunflower												
6	Vegetables												
7	Melons												
8	Fruit trees												
9	Alfalfa												
10	Tobacco												
11													
12													
13													

27) Do you apply animal manure on your household plots? (Yes=1, No=0) _____

28) If yes, does the animal manure come from animals of your household? (Yes=1, No=0) _____

29) Do you purchase animal manure for application on your household plots? (Yes=1, No=0) _____

Code 9 Reasons for growing crop

9.a For own consumption
9.b For feeding own animals
9.c For using as fuel
9.d To earn money from selling
9.e For exchanging with neighbors
9.f For improving land quality
9.g My household has no other alternatives/no other crop suits the quality of my household land
9.h Other (Specify _____)

Code 10 Satisfaction with yield

10.a Very poor
10.b Poor
10.c Satisfactory
10.d Good
10.e Excellent

Code 11 Marketing of crop

11.a Sell near own house
11.b Visit neighbors and sell to them
11.c Give to local store for selling
11.d Take and sell in the local market
11.e Sell to sellers in the street
11.f Other (Specify _____)

Code 12 Source of crop purchase

12.a From neighbors / relatives
12.b From local farmers
12.c Purchase in the local market
12.d Purchase from sellers in the street
12.e Went and harvested myself
12.f Others (Specify_____)

---

30) Could your household cultivate larger land then the current one? (Yes=1; No=0) _____

31-A) **If YES**, what size? (ha) _____

32) For what purpose would you like to cultivate larger land?
(**Code 13**) _____

Code 13

13.a Producing crops only for own consumption
13.b To earn money from selling crops
13.c Cultivate fodder for own livestock
13.d Cultivate crops for fuel
13.e Other (Specify _____

31-B) **If NO**, please tell us 3 main reasons for not willing to operate larger land?

(**Code 14**) Reason 1_____
Reason 2_____
Reason 3_____

Code 14

14.a My household does not have enough labor
14.b My household does not have enough skills for operating larger land
14.c My household knows how to operate larger land, but we do not want because operating larger farms is too complicated
14.d My household does not know how to sell crops
14.e My household does not have enough money
14.f There is not enough water in neighborhood for irrigating larger land
14.d There is no good land in neighborhood
14.h My household does not have access to dekhqan markets to sell products

14.i Other (Specify _____)

VIII. HOUSEHOLD OPINION ON GRASSES GROWN NEAR THE LAKE

33) Do you harvest grasses growing near the lake? (Yes=1; No=0) _____

34) If yes, do you use them as fuel for cooking or heating? (Yes=1; No=0) _____

35) Do you give them as fodder to your animals? (Yes=1; No=0) _____

36) Do you store them over winter? (Yes=1; No=0) _____

37) How many times per months do you harvest this grass? (Yes=1; No=0) _____

38) How would you rate the importance of these grasses for wellbeing of your household? (**Code 15**) _____

Code 15

15.a Absolutely not important
15.b Not important
15.c Somehow important
15.d Very important
15.e Extremely important

39) Do you think the amount of grass is sufficiently available near the lake? (Yes=1; No=0) _____

40) Would you be interested if this grass was planted near the lakes? (Yes=1; No=0) _____

41) Who should plant this grass? (**Code 16**) _____

Code 16 **Who plants the grass**

16.a My household members
16.b My household together with neighboring households and relatives
16.c Local community
16.d Local administration
16.e Foreign organizations
16.f Others (Specify _____)

42) Would you be willing to pay for this grass if a farmer or other organization cultivates it and sells? (Yes=1; No=0) _____
43) If yes, at what price and how much would you buy? (Soums, kg) _____

IX. HOUSEHOLD INCOME STRUCTURE

44)

N	Income source	Does your household have the following sources of income? (Yes=1; No=0)	Among these, what is the most important source of livelihood in your household? (Put 1)	Among these, what is the second important source of livelihood in your household? (Put 1)	During one year, what is approximate amount of money received from these sources? (Soums)	What is the shar of these income in your household's tota incomes (%)
1	Income from selling own produced crop products					
2	Income from selling own produced animal products					
3	Salaries from work in other farm fields and employment in farms					
4	Pensions					
5	Stipend					
6	Remittances from household members working abroad					
7	Salaries from work in governmental organizations					
8	Salaries from work in MTP, WUA or farmers association					
9	Salaries from employment in education sector, including kindergartens					
10	Salaries from employment in public health service, in hospital, in poliklinika					
11	Income from own private business not related to agriculture (taxi driver, barber, small shop)					
12	Income from running own farm					
13						
14						
15						

X. HOUSEHOLD EXPENDITURE STRUCTURE

45) What is the share of expenditures for fuel in your household budget? (%) _____

46) What is the share of expenditures for fodder in your household budget? (%) _____

47) From 100,000 Soums, how would you distribute this amount of money for different expenditures of your household over year? (%)

N	**Name of expenditure**	**%**
1	Food consumption (at home and outside)	
2	Purchasing and repairing clothes	
3	Buying things for hygiene	
4	Money spent for education	
5	Purchase of fuel for heating and cooking	
6	Expenditures for cultivating crops on own plots	
7	Expenditures for feeding and taking care of own livestock	
8	Other important expenditure _____	

THIS IS THE END OF THE INTERVIEW
ONCE AGAIN, THANK YOU FOR YOUR RESPONSE AND TIME!

To be filled out by the interviewer

47) Date of interview (day; month) _____

48) Interview ended time _____

49) Score on the quality of answers (**Code 17)** _____

50) Enumerator's name _____

Code 17
17.a. Very poor
17.b Poor
17.c Satisfactory
17.d Good

17.e Excellent

Annex 2. The translated into the Russian language questionnaire

ОПРОСНИК ДЛЯ ИЗУЧЕНИЯ ДОМОХОЗЯЙСТВ

Использование некачественной воды для производства кормовых культур семейства галофитов и возобновляемых источников энергии

A) Имя респондента _____

B) Время начала интервью _____

C) Район_____

D) Кишлак_____

E) Адрес (бригада, улица, номер дома)_____

I. ОБЩАЯ ИНФОРМАЦИЯ О ДОМОХОЗЯЙСТВЕ

1) Какой размер вашего зем. участка (кв. метров) _____

2) Какое расстояние от вашего дома (участка) до ближайшего дехканского рынка (м)_____

3) Сколько человек у вас в семье, включая временно отсутствующих?_____

4)

N	Имя члена домохозяйства	Пол **(Ж, М)**	Возраст **(лет)**	Образование **(Код 1)**	Род занятий в настоящее время **(Код 2)**	Занят ли этот член домохозяйства в производстве с\х культур на вашем участке?	Занят ли этот член домохозяйства в уходе за животными (КРС или МРС) на вашем участке?
	1	2	3	4	5	6	7
1							
2							
3							
4							
5							
6							
7							
8							
9							

10							

Код 1. Уровень образования

1.a Начальное образование (9 классов школы)
1.b Незаконченное среднее
1.c Среднее (колледж, проф училище)
1.d Академ лицей
1.e Незаконченное высшее
1.f Высшее образование (университет)
1.g Магистратура и далее

Код 2. Род занятий в настоящее время

2.a Ребенок, посещает дет сад или воспитывается дома
2.b Ребенок, ходит в школу, училище или лицей
2.c Подросток, учится в университете или институте
2.d Пенсионер
2.e Домохозяйка
2.f Инвалид, не может работать
2.g Безработный, не получает зарплату
2.h Руководит своим сельскохозяйственным бизнесом
2.i Руководит своим бизнесом
2.j Работает по найму в другом фермерском хозяйстве
2.k Работает сезонно в другом фермерском хозяйстве
2.l Работает в МТП, АВП или Объединении фермерских хозяйств
2.m Работает в частной фирме
2.n Работает в сфере образования, детсаду
2.o Работает в сфере здравоохранения, больнице, поликлинике
2.p Работает в администрации, правительственной организации, например в Хокимияте
2.q Другое (уточните_____)
2.r Другое (уточните _____)
2.s Другое (уточните _____)

II. ЖИВОТНОВОДСТВО

5)

N	Домашние животные	У вас в домохозяйстве есть животные **(да=1; нет=0)**	Сколько животных каждого вида у вас сейчас есть **(кол-во)**	Какой у вас основной источник корма? (**Код 3**)	Какой у вас второй основной источник корма? (**Код 3**	Вы содержите это животное для своего потребления или для продажи его и продукции из него? (**свое потребление=1; продажа=2**)	Где вы продаете продукцию животноводства? (**Код 4**)
	1	2	3	4	5	6	7
1	Быки						
2	Коровы						
3	Телята						
4	Овцы						
5	Козы						
6	Птица						
7	Ослы						
8	Лошади						

Код 3 Источник корма для животных

3.a Пасутся около каналов и в поле
3.b Пасутся около озера
3.c Пасутся на пустыре
3.d Корм выращенный в домохозяйстве
3.e Корм, заработанный на других фермерских хозяйствах
3.f Трава с озера
3.g Приобретенный корм на рынке
3.h другое (уточните _____)

Код 4 Реализация сельхоз продукции

4.a Продажа около дома
4.b Продажа соседям
4.c Продажа через местный магазин
4.d Продажа через местный рынок
4.e Продажа скупщикам (розничным торговцам) на улице
4.f другое (уточните _____)

III. МНЕНИЯ ОТНОСИТЕЛЬНО ДОСТУПА К КОРМАМ

6) Испытывает ли ваше домохозяйство нехватку кормов для животных? (Да=1, Нет=0)_____

7) Случается ли нехватка корма в течение года? (Да=1, Нет=0)_____

8) В какие месяцы года случается такая нехватка чаще всего? _____

9) Как часто в течение года вы покупаете корм животным?_____

10) Сколько времени занимает одна доставка корма? _____

Код 5

5.a Дети женского пола
5.b Дети мужского пола
5.c Взрослые женского пола
5.d Взрослые мужского пола

11) Как далеко вам приходится нести корм? (метров)_____

12) Кто является ответственным за доставку корма в вашем домохозяйстве? (**Код 5**)_____

IV. ВИДЫ КОРМА И ИХ ИСТОЧНИКИ В ДОМОХОЗЯЙСТВЕ

N	Корм	Используете ли вы этот вид корма для своих животных? (**Да=1, Нет=0**)?	Какой их этих видов корма является для вас самым важным? (**Поставьте 1**)	Где вы берете этот вид корма? (**Код 6**)	Сколько кг этого корма вы производите сами? **(кг)**	Сколько кг этого корма вы используете в течение 1 года? **(кг)**	Какую часть корма вы покупаете? **(%)**	По какой цене вы покупаете этот корм? **(сум за кг)**	Сколько вы тратите всего за 1 год на покупку корма? **(сум)**	Сколько времени члены вашего домохозяйства тратят на подготовку корма? Включая на сбор с поля, поездку на рынок **(часов)**	Какое расстояние вы проходите чтобы собрать или купить этот вид корма? **(метров)**
	1	2	3	4	5	6	7	8	9	10	11
1	Солома пшеницы										
2	Солома риса										
3	Стебли кукурузы										
4	Стебли сорго										
5	Зерна кукурузы										
6	Зерна сорго										
7	Хлопковый жмых										
8	Хлопковых шрот										
9	Пшеничные отруби										
10	Рисовые отруби										
11	Люцерна альфальфа										
12	Трава с озера										
13											

Код 6. Источник корма

6.a Выращен на своем зем участке

6.b Приобретен у соседей/родственников

6.c Приобретен у местных фермеров

6.d Куплен на местном рынке
6.e Куплен у розничных торговцев 6.f Собран собственноручно на поле 6.g Другое (уточните_____)

V. ИСТОЧНИК ЭНЕРГОРЕСУРСОВ ДЛЯ ОБОГРЕВА И ПРИГОТОВЛЕНИЯ ПИЩИ

14)

N	Источник энергоресурсов	Какой из энергоресурсов вы используете? (**Да=1, Нет=0**)	Какой из энергоресурсов вы используете для приготовления пищи? (**Поставьте 1**)	Какой из энергоресурсов вы используете для обогрева? (**Поставьте 1)**	Где вы берете этот энергоресурс? (**Код 7**)	Какая единица измерения у вашего источника энергоресурсов?	Какое количество энергоресурсов вы используете в год?	Какую часть энергоресурсов вы покупаете в год? **(%)**	По какой цене вы покупаете этот энергоресурс в этом году? **(сум за единицу)**	Сколько вы всего тратите на покупку этого энергоресурса в год? **(сум)**	Сколько времени вы тратите на приобретение, покупку, доставку этого энергоресурса? **(часов)**	Какое расстоян вы проходит чтобы собрать и купить эт энергоре рс? **(метров**
	1	2	3	4	5	6	7	8	9	10	11	12
1	Сжиженный газ											
2	Керосин											
3	Дизел (салярка)											
4	Бензин											
5	Пр. газ											
6	Уголь											
7	Дрова											
8	Стебли хлопчатника											
9	Трава с озера											
10	Навоз											
11												

Код 7. Источник энергоресурсов

7.a Произведен на своем зем участке
7.b Приобретен у соседей/родственников
7.c Приобретен у местных фермеров
7.d Куплен на местном рынке

7.e Куплен у розничных торговцев
7.f Собран собственноручно на поле 7.g Другое (уточните_____)

VI. МНЕНИЯ ПРО ДОСТУПНОСТЬ ЭНЕРГОРЕСУРСОВ

15) Вы довольны имеющимся количеством энергоресурсов для приготовления пищи? (Да=1, Нет=0)_____

16) Вы довольны имеющимся количеством энергоресурсов для отопления? (Да=1, Нет=0 _____

17) Испытывает ли Ваше домохозяйство проблемы с недостатком топлива? (Да=1, Нет=0)_____

18) В какие месяцы обычно случаются проблемы с недостатком топлива? (название

месяцев)_____

19) Как часто вы покупаете топливо для приготовления пищи в течение года? (сколько раз)_____

20) Как часто вы покупаете топливо для отопления в течение года? (сколько раз)_____

21) Сколько времени вы тратите на доставку топлива для приготовления пищи? (часов)_____

22) Сколько времени вы тратите на доставку топлива для отопления? (часов)_____

23) Кто в вашем домохозяйстве ответственный за доставку топлива для приготовления пищи? (**Код 8**)_____

24) Кто в вашем домохозяйстве ответственный за доставку топлива для отопления? (**Код 8**)_____

25) Использует ли ваше домохозяйство электрогенератор? _____

Код 8. Гендер

8.a Дети женского пола
8.b Дети мужского пола
8.c Взрослые женского пола
8.d Взрослые мужского пола

VII. СЕЛЬСКОХОЗЯЙСТВЕННЫЕ КУЛЬТУРЫ

26)

N	Культуры	Какие культуры вы выращиваете своем участке? **(Да=1; Нет=0)**	Какие выращиваемые три культуры для выс самые важные? **(1-3 по степени важности)**	Посевная площадь культуры **($м^2$)**	Почему вы выращиваете данную культуру? **(Код 9)**	Сколько кг урожая вы собираете с личного участка? **(кг)**	Как вы оцениваете урожай данной культуры? **(Код 10)**	Какие культуры вы продаете в течение года? **(Поставьте 1)**	Какую часть выращенного урожая вы продаете? **(%)**	Где Вы продаете эти культуры? **(Код 11)**	Какие культуры вам необходимо покупать или доставать в течение года?	Какую часть необходимого в течение года кол-ва культуры вы покупаете или получаете? **(%)**	Где вы покупаети (получаете)эти культуры? **(Код 12)**
	1	2	3	4	5	6	7	8	9	10	11	12	13
1	Пшеница												
2	Рис												
3	Кукуруза												
4	Сорго												
5	Подсолнечник												
6	Овощи												
7	Бахчевые												
8	Фруктовые деревья												
9	Люцерна												
10	Табак												
11													
12													
13													

27) Применяете ли вы навоз на вашем участке? **(Да=1, Нет=0)** _____

28) **Если Да**, навоз вы получаете от домашнего скота? **(Да=1, Нет=0)**_____

29) Покупаете ли вы навоз для использования на своем зем участке? **(Да=1, Нет=0)**_____

Код 9. Причины для выращивания

9.a Для собственного потребления
9.b На корм домашнему скоту
9.c Для использования как топливо
9.d Для получения дохода от продажи
9.e Для обмена с соседями
9.f Для улучшения качества земли
9.g Мое д/х не имеет альтернативы или другие культуры невозможно выращивать (качество земли)
9.h Другое (уточните_____)

Код 10. Удовлетворение урожайностью

10.a Очень плохо
10.b Плохо
10.c Удовлетворительно
10.d Хорошо
10.e Отлично

Код 11. Реализация урожая

11.a Продаем около своего дома
11.b Посещаем соседей и продаем им
11.c Даем местному магазину для продажи
11.d Везем для продажи на местном рынке
11.e Продаем торговцам с улицы
11.f Другое (уточните_____)

Код 12. Источник дополнительного количества с\х культур

12.a Соседи / родственники
12.b Местные фермеры
12.c Местный рынок
12.d Торговцы на улице
12.e Сами собираем урожай
12.f Другое (уточните_____)

---

30) Может ли ваше д/х использовать посевную площадь большую чем сейчас **(Да=1; Нет=0)**_____

31-А) **Если Да**, какой размер? (га) _____

32) Для какой цели вы хотели бы возделывать большую посевную площадь? (Код 13) _____

Код 13.

13.a Для собственного потребления
13.b Для получения дохода от продажи
13.c На корм скоту
13.d Для использования в качестве топлива
13.e Другое (уточните_____)

31-В) **если Нет**, укажите три основные причины для невозможности возделывать большую посевную площадь?

(**Код 14**) Причина 1_____

Причина 2_____

Причина 3_____

Код 14.

14.a Мое д/х не имеет достаточной рабочей силы
14.b Мое д/х не имеет достаточных навыков
14.c Мое д/х знает как возделывать большую посевную площадь, но мы не хотим из-за сложности в управлении
14.d Мое д/х не знает как продавать эти культуры
14.e Мое д/х не имеет достаточных финансовых средств
14.f Нехватка воды для орошения такого большого участка земли
14.d Нет хорошей земли в округе
14.h Мое д/х не имеет доступа к дехканским рынкам для продажи урожая

14.i Другое (уточните_____)

VIII. МНЕНИЕ ДОМОХОЗЯЙСТВА О ТРАВАХ ВЫРАЩИВАЕМЫХ ОКОЛО ОЗЕРА

33) Косите ли вы траву около озера? **(Да=1; Нет=0)_____**

34) Если Да, используете ли вы траву как топливо для приготовления пищи или отопления? **(Да=1; Нет=0)_____**

35) Используете ли вы траву на корм скоту? **(Да=1; Нет=0)_____**

36) Храните ли вы траву в течение зимы? **(Да=1; Нет=0)_____**

37) Сколько раз вы косите траву в течение сезона? _____

38) Как Вы оцениваете значение этих трав для благополучия Вашего д/х? (**Код 15**)_____

Код 15.Вважность трав для хозяйства

15.a Абсолютно неважно
15.b Неважно
15.c Немного важно
15.d Очень важно
15.e Чрезвычайно важно

39) Считаете ли вы, что есть необходимое кол-во травы около озера? **((Да=1; Нет=0)_____**

40) Заинтересовались ли бы вы если бы эта трава выращивалась около озера? **(Да=1; Нет=0)_____**

41) Кто должен сажать эту траву? (**Код 16**)_____

Код 16. Кто сажает траву

16.a Члены моего хозяйства
16.b Мое хозяйство наряду с соседними хозяйствами и родственниками
16.c Местное сообщество
16.d Местная администрация
16.e Иностранные организации
16.f Другое (уточните_____)

42) Согласны ли вы платить за эту траву если фермеры или организация выращивает и продает траву? **(Да=1; Нет=0)_____**

43) **Если Да**, по какой цене и сколько вы бы покупали? (**сумы, кг**)_____

IX. СТРУКТУРА ДОХОДА ДОМОХОЗЯЙСТВА

44)

N	Источник дохода	Имеет ли Ваше д/х эти источники дохода **(Да=1; Нет=0)**	Какой самый важный источник дохода для Вашего д/х? **(поставьте 1)**	Какой источник дохода второй по степени важности для Вашего д/х? **(поставьте 1)**	Каков примерный размер годового дохода от этих источников?? **(сум)**	Какова доля этих источников в общем доходе д/х? **(%)**
1	Доход от продажи собственного урожая					
2	Доход от продажи продуктов от домашнего скота					
3	Зарплата за работу на ф/х					
4	Пенсия					
5	Стипендия					
6	Денежные переводы членов д/х работающих зарубежом					
7	Зарплата за работу в госорганизациях					
8	Зарплата за работу на МТП, АВП, объединении фермеров					
9	Зарплата за работу в сфере образования, включая детские сады					
10	Зарплата за работу в сфере здравоохранения, больнице, поликлинике					
11	Доход от частного бизнеса вне сферы с/х (такси, парикмахерская, магазин)					
12	Доход от собственного ф/х					
13						
14						
15						

X. СТРУКТУРА РАСХОДОВ ДОМОХОЗЯЙСТВА

45) Какова доля расходов на топливо в общем бюджете вашего д/х? (%)_____

46) Какова доля расходов на питание в общем бюджете вашего д/х? (%)_____

47) Как вы распределяете ваш бюджет между расходами в течение года? (%)

N	**Расходы**	**%**
1	Потребление пищи (дома и вне)	
2	Одежда и ее ремонт (пошив)	
3	Средства гигиены	
4	Деньги потраченные на образование (школа, лицей/колледж универ и т.д.)	
5	Покупка топлива для приготовления пищи и отопления	
6	Расходы на выращивание культур на собственной земле	
7	Содержание и корм домашнего скота	
8	Другое (важное)_____	

ЭТО КОНЕЦ ОПРОСА
ЕЩЕ РАЗ БОЛЬШОЕ СПАСИБО ЗА ВАШИ ОТВЕТЫ И ЗА УДЕЛЕННОЕ ВРЕМЯ!

Заполняется тем кто проводит интервью

47) Дата проведения интервью _____

48) Время окончания интервью _____

49) Качество ответов (**Код 17)** _____

50) Имя того, кто проводил интервью _____

Код 17.
17.a. Очень низкое
17.b Низкое
17.c Удовлетворительное
17.d Хорошее

17.e Отличное

Annex 3. The list of the interviewed households

No	Name of the interviewed household member
1	Palvanov Shomurat
2	Abdullaev Khudorgan
3	Azamat Atajanov
4	Abdullaev Egambergan
5	Holmetova Ugiljan
6	Matkarimov Altivay
7	Matkarimov Botir
8	Qadamov Qurolbek
9	Qutlimuratov Elyor
10	Abdullaev Reimboy
11	Sotivoldiev Azat
12	Qutlimova Sultanpasha
13	Matyakubov Komil
14	Qutlieva Dilavar
15	Ataniyazov Jumanazar
16	Yusupova Guliston
17	Ruzmetova Guljan
18	Boltaev Bekdurdi
19	Matniyazov Bahodir
20	Sadullaev Saparbay
21	Qutlimuratov Ashirboy
22	Ataniyazov Azatboy
23	Kuryazov Sarvar
24	Ataniyazova Zulayho
25	Rahimova Dilrabo
26	Abdurahmonov Mehribon