Baseline survey in Karauzyak district, Karakalpakstan

Final report

with description of findings in relation to socio-economic situation in the study area, level of awareness and knowledge concerning alternative agricultural practices; energy sources; water use, attitudes to current land management.

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Contents

1. Summary

Baseline survey in the selected Karauzyak district of Karakalpakstan was undertaken in the framework of the DS CRP Activity "Improving the productive use of marginal lands in mixed farming and pastoral systems" in the Aral Sea Action Site.

In total 100 households residing in 2 Village Citizen Councils "Karabuga" and "Algabas" have been randomly selected and interviewed. The project activity report summarizes field visit activities, including elaboration of questionnaires, selection and training of interviewers, selection and interviewing of households, interviewing of key informants and collection of secondary statistical data on district and province levels.

2. Background on Karakalpakstan

Location and administrative division

The Republic of Karakalpakstan is located in the Northwestern part of Uzbekistan with an area of ca. 166,600 km^2, embracing the vast dry lands in the lowest reaches of the Amudarya Basin and also the Aral Sea. Most of the Karakalpak territory consists of low land (from 50 to 200 m above sea level) with small percentage of hills. The flatness is its most prominent physical feature. Most of the settlements as well as the prevailing activities, including agricultural production, are concentrated in the irrigated river plain on the delta of the Amudarya river.

As a separate administrative unit Karakalpakstan was founded on February 16th, 1925. On April 9th, 1993 the autonomous province of Karakalpakstan (within Uzbekistan) was converted to the Republic of Karakalpakstan. Administratively Karakalpakstan consists of 14 districts and includes 38 settlements (of which 12 are towns, 26 are rural settlements) and 139 village citizen councils (VCC). The capital city is Nukus.

Demographics

The population in Karakalpakstan was estimated at 1,774.1 thousand as of January 1st, 2015, of which 876.7 thousand people (49.4%) reside in urban area, the remaining 50.6% live in rural settlements. Despite Karakalpakstan forms 37.1% of the total territory of Uzbekistan, only ca. 5.9% of the total population of Uzbekistan inhabit Karakalpakstan. Thus, population density is only 10.3 people per km^2, which is quite low compared to the national average population density of 67 people per km^2. Average population growth is 1.5%. Infant mortality rate in Karakalpakstan is relatively higher than of the national average.

The average age of the population in 2015 is 27.2 years, for women average age is higher – 27.7 and for men lower than average – 26.7 years old. Total labor force stands at 1020.7 thousand people, of which able-bodied population includes 1,017.1 thousand people. Currently employed in various branches of economy are 631.4 thousand people (or 4.9% of total employed in Uzbekistan).

Economic development

The main branches of industry include: light industry, electricity generating industry, food industry, fuel industry, chemical and oil-chemical industry, flour milling industry and industry of construction materials. Gross Regional Production (GRP) of Karakalpakstan in 2014 amounted to 3,632 billion UZS, which constituted ca. only 2.5% of the GDP of Uzbekistan. GRP per capita in 2014 in Karakalpakstan was 2,047 thousand UZS. Average monthly salary in 2014 hardly reached 211 thousand UZS (one of the lowest economic indicators in Uzbekistan).

Agricultural production

Agriculture is the second largest sector of regional economy, contributing one fifth (20%) to Karakalpak GRP (Figure 1). The main agricultural products in Karakalpakstan are wheat, cotton vegetables, forage crops and livestock products. In 2013 agriculture of Karakalpakstan produced output worth 930 billion UZS with the main contributors shirkats (1.7%), private farms (35.1%), rural households (dehqons – 63.2%). Livestock products in 2013 were produced in the amount of: meat – 77.2 tons, cow milk – 272 tons, eggs – 164 mln. Valid for 2013 were heads of livestock: cattle – 861.1 thousand heads, including cows – 268.4 thousand heads, small ruminant (sheep and goats) 838.6 thousand heads.

The gross output of agriculture and livestock in Karakalpakstan indicates 52% and 48% (State Statistics Committee, 2013). Therefore, the contribution of livestock sector to Karakalpakstan economy seems to be considerably high. On the other hand, the number of cattle in Karakalpakstan as of 2013 has been around 8.3% of Uzbekistan, small ruminants – less than 5% of the national figure.

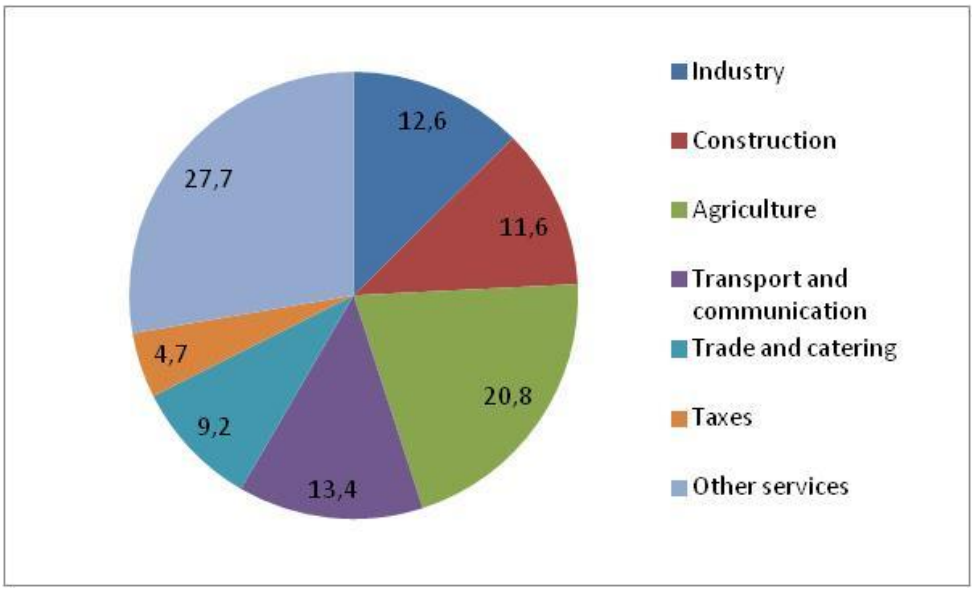

Figure 1. Composition of GRP of Karakalpakstan, 2013

Source: own compilation based in State Statistics Committee, 2013

Land use

Total agricultural land in Karakalpakstan comprises 2,106.5 thousand ha, rural households cultivated plots occupy 35.5 thousand ha and land under forests or other tree plantations stand at 1,129 thousand ha (State Statistics Committee, 2013). Actually annually cultivated area is lower and varies with irrigation water availability and supply and in some years may be as low as 50-55% of the total arable land. Total area under forage crops is in the range of 24-30 thousand ha per year. The increases in the livestock herd have not been matched by corresponding increases in production of feed crops for animals. On the contrary, the livestock feed base has shrunk dramatically since 1991 (UNDP, 2008).

Under the severe climate of cold winter and hot summer, the productivity of crop, livestock and fishery in Karakalpakstan are low. Reflecting such conditions, the level of livelihood in the area is also low and the area is considered to be one of the most depressed regions in the Republic of Uzbekistan.

3. Methodology

Activities of the Baseline study within the current Agreement were conducted stepwise and included elaboration (fine-tuning) of questionnaires, selection and training of interviewers, selection and interviewing of households, interviewing of key informants and collection of secondary statistical data on district and province levels.

Sites selection

Two Village Citizen Councils (VCC) in Karauzyak district have been selected for the survey: "Karabuga" located to the South from the district centre and having more favorable conditions, and "Algabas" located to the North from the district centre and having harsh climatic conditions and greater impact of the Aral Sea Disaster.

The surveyed households (mostly through group interviews) in both VCCs have been geolocated using GPS tools (Figure 2, Table 1).

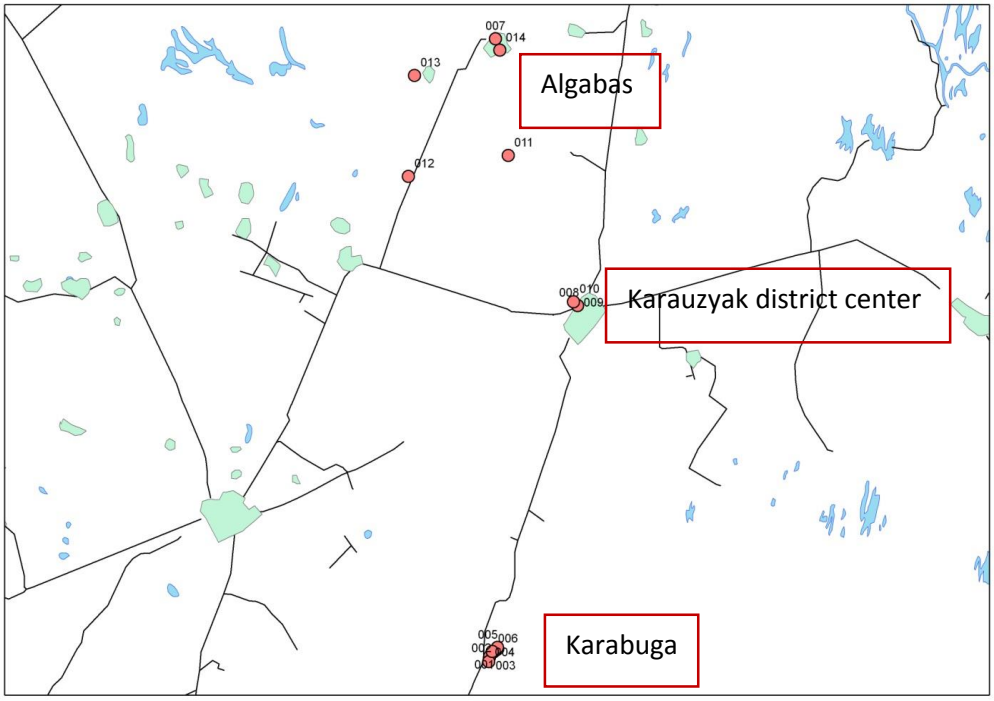

Figure 2. Geolocation of surveyed households with GPS coordinates

Source: GIS lab of NGO KRASS

Table 1. Geocoordinates of the surveyed households in VCCs

GPS point	Village Citizen Council	Latitude	Longitude
001	Karabuga	42.8635936975479	59.9523603916169
002	Karabuga	42.865042090416	59.9555361270905
003	Karabuga	42.8613352775574	59.9497640132905
004	Karabuga	42.858926653862	59.9491041898728
005	Karabuga	42.8657072782517	59.9552196264268
006	Karabuga	42.8638672828675	59.9515825510026
007	Algabas	43.1667637825013	59.9684482812882
008	Food stuff market Karauzyk	43.0334204435349	60.0173771381379
009	Clothes market Karauzyak	43.0334204435349	60.0173664093018
010	Livestock market Karauzyak	43.0353409051896	60.0147271156312

011	Algabas	43.1088227033615	59.9742096662522
012	Algabas	43.1001752614975	59.9064302444459
013	Algabas	43.14996778965	59.9128836393357
014	Algabas	43.1609809398651	59.971109032631

Questionnaires

Questionnaire for the BLS in Karakalpakstan have been originally provided by ICARDA-CAC (tested and applied during BLS in Kyrgyzstan), and then adapted to the conditions and institutional settings in Uzbekistan/Karakalpakstan. A semi-structured questionnaire consisted of 19 pages (Annex 1), 11 major sections, including: General information about the surveyed household; Information on the Head of the household; Demographic information about the surveyed household; Financial, Physical, Natural and Social capital of the surveyed household; Agricultural (plant growing) activities the surveyed household; Access, quality, volume and management of water resources; Animal husbandry activities and management; Agricultural markets and food security; Agricultural strategies; Loans and access to credits; Vulnerability of agricultural systems and local resolving and adaptation mechanisms.

Selection and training of interviewers

For a successful field visit and survey it is essential to have reliable local contact persons, and to know or at least have somebody who speaks local language. Thus, three students from Karakalpak State University knowing Karakalpaki, Russian and English languages have been selected for conducting interviews in Karauzyak district. These students have been trained for conducting interviews and handling questionnaires. These students have been responsible for interviewing the respondents, filling in and cleaning the questionnaires and entering responses to the data base. GPS tools were provided to the interviewers for geopositioning of the respondents or interviewing places. Preparation and submission of field trip reports by the involved students was also part of the responsibilities of the selected interviewers.

Selection and interviewing of households

In total 100 households living in 2 Village Citizen Councils “Karabuga” and “Algabas” have been randomly selected and interviewed. Of great help and support has been the head of local administration, his assistants, the Head of the Veterinary Service and Heads of the Village Citizen Councils. The consultants of the Village Citizen Councils (females) helped to find interviewees, set contacts with local population and provide some local statistics. Since the interview took place in the peak agricultural season, sometimes there were problems with finding the respondents or with keeping them for 2 hours during the interview. Thus based on the advice of the Village Citizen Councils consultants, a mix of individual and group interviewing methodology was applied. Group interviews took place sometimes in the local houses, sometimes in the office of Village Citizen Councils or in the buildings or local schools, medical stations or even kindergarten.

Interviewing of key informants

Key informant interviews – UNDP office in Nukus for contacts, head of local administration and his assistants, Head of the Veterinary Service, heads of Village Citizen Councils of selected areas Karabuga and Algabas, consultants from Village Citizen Councils. The letters of support (Annexes 2 and 3) from ICARDA-CAC to Khokim of Karauzyak district as well as to the Head of the UNDP office in Nukus were of great help to set up contacts with key informants and for collection of secondary data.

Collection of secondary statistical data

Secondary data collection took place at Karauzyak District Statistics Office, as well as at Karakalpakstan Republican Statistical Department in Nukus.

Data cleaning and entry into Excel data base

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.

4. Characterization of the study sites and communities

4.1 Karauzyak district of Karakalpakstan

The study district – Karauzyak – is one of the 14 districts of the Republic of Karakalpakstan. It was established on 26th of September, 1975. The district is located in Northeastern part of Karkalpakstan and borders Chimboy, Kegeliy and Nukus districts on the West, Muynok district on the North, Takhtakupir district on the East, Beruniy district on the South-east and Amudaryo district on South-west.

Total territory of Karauzyak district is 5.9 thousand km^2, of which agricultural arable land covers ca. 32.2 thousand ha, arable land – ca. 18 thousand ha, pastures – 380.1 thousand ha, and plots of local population (‘*tamorka*’) cover 2.2 ha.

Climate is sharp continental with average air temperature in January of 6 ...8^0 C below zero, in June of 28 ...32^0 C above zero. In July-August the temperature can rise above 45^0 C.

Administratively Karauzyak district is comprised of 1 urban settlement (SCC), 4 Mahallya Citizen Councils (MCC), 8 Village Citizen Councils (VCC) (Table 2).

Demographic indicators

Total population as of January 1, 2015 reached 50,306 people, forming 7,781 households (families). Gender-wise, population is balanced with 0.5% overbalance of men (Table 2). Population-wise Karabuga and Algabas are almost identical, whereas more families live in Karabuga – 709 households vs. 675 households in Algabas.

Table 2. Households and population of the Karauzyak district

№	VCC	Households	Population	Including	
				Men	Women
1	Karakol	712	5,215	2,615	2,600
2	Berdakh	882	5,495	2,749	2,746
3	Algabas	675	5,208	2,638	2,570
4	Koybak	228	1,446	725	721
5	Madaniyat	896	5,640	2,830	2,810
6	Karauzyak	710	5,058	2,532	2,526
7	Esimozek	370	2,421	1,215	1,206
8	Karabuga	709	4,920	2,470	2,450
	Total for VCC	**5,182**	**35,403**	**17,774**	**17,629**
1	SCC	381	1,872	980	892
2	№1-MCC	510	3,391	1,782	1,609
3	№2-MCC	594	3,280	1,644	1,636
4	№3-MCC	455	3,061	1,597	1,464
5	№4-MCC	659	3,299	1,652	1,647
	Total for district	**7,781**	**50,306**	**25,429**	**24,877**
			100%	50.5%	49.5%

Annual population growth in Karauzyak district stands at 1.5%. Age structure of the population includes 36.2% of children (below 16 years of age), 56.9% of grown-up or able-bodied population (for women below 55 years and for men below 60 years of age) and 6.9% of elderly people (above 55 for women and 60 years of age for men).

Economic and agricultural indicators

The economy of Karauzyak district is based primarily on agricultural production, i.e. on cotton and wheat cultivation.

Some industrial branches are developed with 31 enterprises, providing employment for 420 workers and producing output worth 3.8 billion UZS. In 2014 industrial branches also earned export revenue to the region worth 127.5 thousand USD.

According to official statistics, in the first half of 2015 agricultural producers provided 485 tons of meat, 1,250 tons of milk, 1,595 thousand eggs and 1,329 tons of wool. The major contributors to total animal husbandry agricultural output were local rural households (except for the wool and fish), which produced and marketed 98.8% of meat, 98% of milk, 88.9% of eggs, 71.6% of karakul (astrakhan fur). Agricultural enterprises were second large contributors and private farms contributed the least (Table 3).

Table 3. Agricultural (animal husbandry) production in Karauzyak district in January-June 2015

Agricultural (animal husbandry) products	Unit	Total	Agricultural producers	Rural households	(%)	Private farms
Meat	tons	485	3.5	479.3	98.8	2.2
Milk	tons	1,250	23	1,224.9	98.0	2.1
Eggs	thousand	1,595	160	1,418	88.9	0.21
Wool	tons	1,329	356	34.1	2.6	17
Karakul	tons	1,529	356	1,095	71.6	78
Fish	tons	61	29	16	26.2	16

According to official statistics rural household possess the main amount of livestock animals (Table 4), including cattle, cows, sheep, horses, poultry and goats (not in official statistics). Baseline survey showed that goats are preferable animals in the Northern part of Karauzyak district, such as for example Algabas VCC, due to more drastic climatic conditions (colder winters and less fodder stock) since sheep are more sensitive animals compared to goats.

Table 4. Number of cattle and poultry in Karauzyak district in January-June 2015

	Total	Agricultural enterprises	Rural households	Private farms
Cattle	29,230	648	28,455	127
including cows	9,691	186	9,447	58
Sheep	79,135	19,850	58,410	875
Horses	1,447	59	1,364	24
Poultry	125,079	2,600	121,129	1,350

With regards to agricultural plant production official statistics reports production of wheat, potato, vegetables, melons and fruits in Karauzyak district. Again rural households were the main contributors to most of the crops in 2014, except wheat, which was to a large extent produced by private farms (Table 5).

Table 5. Agricultural (plant growing) production in 2014

	Unit	Total	Rural households	Private farms	Agricultural enterprises
Wheat	tons	7,256.8	633	6,586.8	37
Potato	tons	140	140		
Vegetables	tons	435.7	435.7		
Melons	tons	148	148		
Fruits	tons	30.1	25.6		4.5

Social development indicators

With regards to social indicators, Karauzyak district has 1 Social Support Fund, which distributes pensions to 4,914 people (as of January 2015), including age retirees and disabled persons. This fund also provides social (hardship) allowances to 414 residents of Karauzyak district.

Karauzyak population can receive medical treatment in 1 hospital with 135 beds and 1 out-patient's clinic in Karauzyak district center. There are also 11 village medical points (in VCCs and MCCs) which provide medical checks and first aid to the residents of villages. In total 64 medical doctors and 495 nurses work in the medical sector of Karauzyak district.

There are 5 libraries in Karauzyak district, 1 music school and 1 cinema theatre.

As in the rest of Uzbekistan, secondary educational sector is set up to have secondary educational institutions (colleges or lyceums) in each district. Thus, there are 3 colleges in Karauzyak district with 1,378 college students (above 15 years of age).

Primary educational institutions – schools are located in each VCC, in total there are 32 schools in Karauzyak district educating 6,084 children of school age (7 to 15 years old) with the help of 1,167 school teachers. Some VCCs and district center have kindergartens – 9 kindergartens in total for Karauzyak district with the capacity to accept 895 children of pre-school age.

Infrastructure and communal services (gas, tap water, electricity) development

The general trend of energy supply in Karakalpakstan follows rest of the country pattern, i.e. the closer to administrative centers or cities, the more reliable is gas supply. Furthermore, there were some complaints of rather low quality, warn-out state and deterioration of gas supplying pipes.

With regards to drinking water supply, most villages in Karakalpakstan have installed tap water system, which often do not function. So, rural households rely on pumps and wells near their houses for drinking water, which can be of unsatisfactory quality (saline, with sand, etc.).

All villages in Karakalpakstan are connected to electricity and gas supplying grids, which are often outdated and require maintenance. For both energy sources there are often cuts, the supply of especially gas is erratic especially with remoteness from administrative centers. Nevertheless, in rural houses there is a heating system, including water (gas) boiler and heating pipes and radiators in the rooms.

In general, rural households believe that local administration (Village Citizens Council - VCC) is responsible for creating favorable conditions, initiating maintenance works of the pipes system

and negotiating gas supply with district administration. In those villages with active VCC heads there is centralized energy supply.

Due to insufficient gas supply, especially in the heating season, which in Karakalpakstan starts earlier than in other provinces of Uzbekistan (early October - late March) and lasts longer, for almost 6 months.

For backstopping heating options, many rural houses have alternative heating stoves, operating on fuelwood (tamarisk, other local shrubs and trees) and coal (the so-called 'Leninskaya pech', 'kontramarka'), but heating limited rooms in the house. Still some more advanced households keep boiler type of the heating system, but switch it to liquid gas tanks. In rare occasions households may use electric heaters, but in limited period due to erratic electricity supply and low direct current voltage.

In those remote villages not supplied with gas, villagers have outside cooking facilities – cooking stoves, operating on fuelwood (cotton stems or twigs of trees) and used all year round. Some rural households construct their heating stoves (Leninskaya pech', 'kontramarka') so that they have some flat surface for cooking purposes in winter, but have to cook outside during summer. Some better off rural households have equipped their ordinary gas stoves with liquid gas tanks for cooking purposes (one filling supports cooking energy requirement for up to 3 months) and can use such gas stove all year round.

4.2 Karabuga

Karabuga is one of the eight VCCs in Karauzyak district. Total population of the village comprises 4,920 people (as of January 1st 2015), living in 709 rural households.

According to Karauzyak Khokim, Karabuga is a well-to-do village with rather wealthy households. The village is favorably located in the upstream of an irrigation channel. Moreover, villagers have pumps and can easily cope with water shortages during agricultural season. There is enough land, even more than villagers can handle. There is a possibility to add some land to agricultural production upon sufficient labor for agricultural production.

The houses in Karabuga are well constructed with households' land plots located close to the house and in many occasions with additional land plots (*tamorka)* within farmers' fields. There are several big orchards with various fruit trees, including the newly established. There are some plans to develop fruit processing capacities in the near future in Karabuga.

According to official statistics as of August 1st 2015 there were 3,293 heads of cattle, 6,857 small ruminants (mostly goats) and over 13 thousand poultry in Karabuga.

The villagers are hard-working and experienced agricultural producers, easily managing subsistence production. The number of private farms is low. There is 1 one prominent cattle breeding farmer, who produces and sells milk in Nukus, both for consumers and processors.

With regards to social infrastructure, there are 4 schools, 1 kindergarten, and a newly built restaurant for celebrating local feasts, weddings. There is 1 medical point, providing first aid and medical treatment and awareness campaigns against diseases, including animal transmitting diseases. A vet station provides veterinary services to the villagers, such as vaccination of animals, curing of animals and treatment against pests and parasites. There is 1 militia base and postal office in Karabuga.

4.3 Algabas

Algabas is the other surveyed village out of eight VCCs in Karauzyak district. Algabas includes 19 auls. Total population of the village comprises 5,208 people (as of January 1st 2015), living in 675 households, but 779 families since it happens that one household may be comprised of more

than 1 family (sons get married and stay and live in one house). Besides rural households (*dehqons*) there are 27 farmers in Algabas, which fulfill state ordered production of cotton and wheat.

According to Karauzyak Khokim, Algabas has worse socio-economic and climatic conditions. This VCC is located to the North of the district, at the tail end of the irrigation channel and thus facing higher temperatures extremes (above $+50^0$C in summer and below -20^0C in winter) and stronger deficits of irrigation water. Villagers are not very wealthy; there are not many big houses, not much vegetation in Algabas.

With regards to infrastructure, Algabas is connected to gas supplying and electricity, but cuts are often, especially in late autumn-winter-early spring. Heating of the houses is possible only with fuelwood, or coal.

With regards to transportation, there are some bus routs from Karauzayk center to other districts and Nukus city. In order to get to Karauzyak district center private cars or taxis are used.

Each VCC has a female consultant who acts as intermediary between regional/local government and villagers with regards to various topics including health, agriculture, human and animal diseases, trainings, etc. According to the consultant of Algabas, female villagers lead harder life, since much housework is on their shoulders coupled with low energy supply for cooking, heating and cleaning. On the other hand female villagers are more active and eagerly participate on seminars, meetings, trainings. The peculiarity is that elderly females, or at least after getting married (on average at the age of 18-20) are allowed to be active in public life of the village.

Karakalpaki people in general are very generous and like to conduct big feasts (festivities) with much meat, bread, guests from different places. It is more expensive to marry a daughter than a son. On average the bride money 'kalim' which a groom has to pay to the girl's parents is around 3-5 mln. UZS. In turn, the bride has to bring along much marriage portion.

Since it is hard to do agriculture in Algabas, there is high seasonal labor migration to basically Kazakhstan (closest to Karakalpakstan and similar language). Besides, very many families, Kazakhs by ethnicity, have already left the village. Currently migration is lower, when girls leave the village after marriage, or educated villagers find jobs in Nukus or even Tashkent.

Rural households manage to grow forage crops, very little vegetables. Local people lead very simple lives, do not have ambitions to become rich or have better houses and cars.

There are 4 schools, but no kindergarten, 1 medical point, providing first aid and medical treatment. There is 1 militia base and postal office in Algabas VCC. Finally, a veterinary station provides veterinary services to the villagers of Algabas VCC.

School education provided in the village is of satisfactory quality and as a result only 5-10 teenagers manage to enter University. In case a teenager starts higher education on contractual terms, some parents, who can afford such education, sell livestock in order to cover educational fees. Girls with higher education have higher chances for a good marriage outside the village.

4.4 Main livelihood strategies

There are several livelihood strategies available and prominent in rural areas of Uzbekistan and Karakalpakstan. Basically, households in rural areas survive on subsistence agriculture, i.e. produce crops, keep livestock and poultry for subsistence purposes and to a less extent to generate cash and in-kind income. Thus, agricultural production (both growing crops and keeping livestock) on household plots is a dominant livelihood strategy for the majority of rural households in Uzbekistan (Conliffe, 2014). Surveyed indicated equal importance of livestock and crop growing, whereas villages with better access to irrigation water rely more on crop production rather than on livestock, since for keeping livestock forage production is also needed. Importance of either agricultural production type depends on climatic condition, in particular water availability and

accessibility. During drought or water scarce seasons the priority is given to livestock rearing and the more so to small ruminant breeding.

In the surveyed villages of Karakalpakstan *dehqons* cultivate food crops for themselves (vegetables, potato, watermelons, wheat, beans, etc.) and fodder crops for livestock (sorghum, maize). Small (up to 0.24 ha) private land plots are used for producing output either for personal consumption or trade in rural districts providing up to 30% of household income. This is a significant share of rural income, especially for poor and middle income rural families. There are also few large farmers who cultivate cotton and wheat under state order. These large farmers are usually the most prosperous members of the community.

Livestock plays an important role in the subsistence of rural households. Households breed mostly cows, goats, and poultry. The relative importance of livestock breeding compared to other activities in the surveyed villages has not changed for the last 10 years, according to local residents. The whole families are involved in livestock and small ruminants raising; children for herding, women for processing milk, wool and pelts and men for lambing, slaughtering, shearing and protecting sheep from predators. In the last decade a number of people and even the whole families are leaving the villages for the city and even other countries (Kazakhstan), so Karakul rearing has ceased in some areas. Sheep heads are declining rapidly and problems such as soil erosion have increased.

Benefits from the livestock are usually consumed within the households themselves in the form of meat and milk, sometimes wool. Minor share of households breeds livestock to gain monetary profit, which is then used for covering the costs of education for kids, or making winter stocks of some products, or for celebrating important events. Karakul sheep are the family's savings, sold when cash is needed and exchanged for other goods. Usually, a typical household sells its goats, cows or sheep at the end of summer to receive cash for some important family events like wedding, or to cover education costs (school appliances, cloth) for its children. Household in the surveyed villages consume of 10-15 kg of own produced lamb, goat meat and poultry, and sometimes purchased beef.

Another important livelihood strategy in rural areas is engagement in seasonal labor migration to Russia and Kazakhstan mainly to provide unskilled labor to the construction industry, but also working in the trade and market sector. Remittances from labor migrants are considered one of the main and important sources of cash income for rural families.

Rural families, which manage to support and provide education for family members may rely on the salaries from official jobs at state-funded or budget organizations, such as schools, kindergartens, medical units, local governance offices. This strategy is however more of a 'prestige' character, rather than a major income source.

Some entrepreneurial activities are common in the villages, including traditional activities such as sewing, hairdressing, and construction. These activities do not require much education or highly qualified skills, but can provide stable albeit moderate income for rural households.

4.5 The main agricultural production systems

The main agricultural production systems in Uzbekistan are plant growing and livestock rearing. Both agricultural production systems are equally important for the country and for the population in terms of providing food security, employment and cash source for rural inhabitants as well as serving a resource base for the subsequent agro-processing industry.

Plant growing covers production of various agricultural crops from cotton for export earnings; grains, vegetables and fruits for feeding the population to the production of forage crops for livestock.

Livestock production in Uzbekistan is distinguished by its richness and variety. Each animal type is dominating in its own agro-ecological zone. Thus, milk cattle are mainly found in irrigated croplands near industrial centers; beef cattle in mountain zone pasture areas; Karakul sheep production systems are mainly in deserts; meat-wool and ram production systems and horse breeding are concentrated in pre-and mountain zones of the Fergana valley, while pig and poultry production industries are near large cities and industrial centers (JICA, 2011).

The main types of agricultural producers in Uzbekistan are: (1) private farms, (2) rural households (dehqons) engaged in both plant growing and livestock rearing, but basically for own subsistence; (3) few remaining agricultural cooperatives engaged in certain agricultural activities such as for example Karakul breeding cooperatives; and (4) agrifirms, established by certain industrial (agro-processing) businesses for producing and processing certain products, such as for example licorice roots for pharmaceutical industry.

The combination of large private farms and rural households can provide considerable benefits in terms of rural employment, income and food security and of the adoption of new agricultural technologies and maintenance of desired levels of cotton production (Djanibekov et al., 2014).

Private farms

A private farm is a legal entity established for agricultural production purposes, is generally operated by family members and employed seasonal labor during the vegetation season. Private farms lease agricultural land from the state at zero rent with long-term usufruct rights (for a period of up to 50 years). This implies that farmers cannot use their leased land, for instance, as collateral for accessing credit (Djanibekov et al., 2014). In light of the recent 'consolidation' wave, which will be completed in December 2015, the average private farm size in Uzbekistan will lie in the range of 30-50 ha, whereas in Karakalpakstan, with excess land resources, private farms may lease 50-70 ha of land.

Concurrently legislation defines three types of private farms based on their production specialization: (1) cotton and wheat farms (the largest and dominant farm type) that also produce rice and vegetables on a small share of their farmland, (2) horticultural and gardening farms (specialized in fruits, grapes and vegetables production), and (3) livestock-rearing and poultry farms. The latter two farm types are not part of the state procurement system (Djanibekov et al., 2014).

Private farms are considered to have advantages regarding access to markets, infrastructure, and technology.

Dehqons

Dehqons - small family facilities with or without the legal status, carrying out small scale agricultural production and its marketing on the basis of personal work of the members of family on the allocated land plot (DCMRU №300, 1998). *Dehqons* can be simply referred to as rural households. Considering the population, it was estimated that about 95% of the total rural households in Karakalpakstan can be categorized as *dehqons* (JICA, 2011).

During the former Soviet-era, workers of *kolkhoz* and *sovkhoz*, consisting not only of farm-labors but also of workers having various kinds of jobs, received a small plot to grow crops for self-consumption. After independence the Uzbek agriculture related legislation intended to provide equal access to land by rural households to prevent an increase in the number of rural, landless poor and to contribute to an increase in food and cotton production. Beginning in 1991, the state started to take land from former collectives and divide it into additional household plots. Every

household received official rights of lifelong inheritable tenure of a plot which is called *tamorka*. *Tamorka*s may be often located within walking distance of a household's village.

According to the land legislation *dehqon*s 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 to plant and to sell at their own discretion. Still, *tamorkas* are too small in size to generate profits at a scale that would negate the need to generate additional income via other means.

The numerous *dehqons* play an important role in the livestock breeding in Karakalpakstan, despite their small farm size. They own few livestock heads per household, but as a whole the total number of livestock owned by *dehqons* as well as the production of livestock products (meat, milk, eggs, wool, etc.) represent much larger shares in national and regional agricultural statistics. Despite their important role in food security and poverty alleviation, rural households lack the ability to cope with an increasing variability of commodity prices and increasing input prices for which they do not have sufficient capital (Conliffe, 2014).

In Uzbekistan, rural households heavily depend on earnings from employment in private farms in addition to the income from the non-agricultural sector. In this respect, the economic performance of the private farms is essential in providing not only rural employment, but also in securing the rural sources of income and the food situation in rural households (Conliffe, 2014).

5. Baseline study results

Rural households located in the selected villages of Karauzyak - Karabuga and Algabas have been surveyed. All findings are based on the survey of 100 households.

5.1 General information and the head of the household

The general information about surveyed households and info on household's head included data about the head of the household such as sex, education and experience in agricultural production, household size, gender structure, education of the households' members, information about family members such as age, education, current occupation.

Table 6. Sex of the HH head

Household	Male	Female
number	87	13
share	87%	13%

Survey showed that 87% of the households in rural Karakalpakstan are usually led by males (Table 6). It sounds normal given the fact, that males play the leading role in eastern culture. Though, there are families where a woman is a head, but it is mainly attributed to the fact that woman are either single or elder ones in those households.

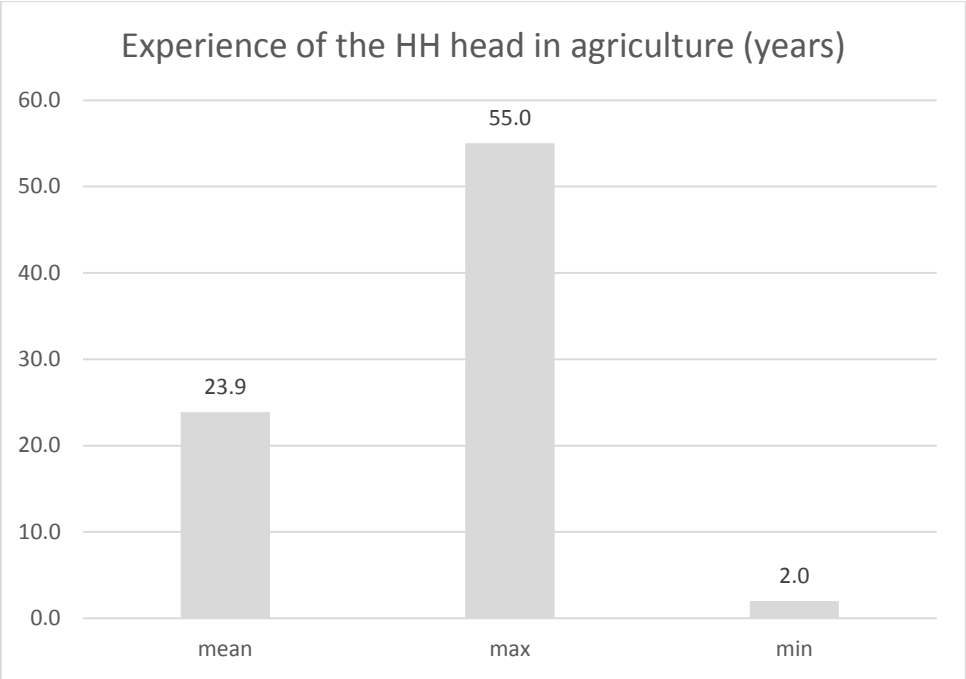

Figure 3. Experience of the household head in agriculture

For the head of a household it is important to possess rich experience in agriculture, since he or she determines the livelihood strategy of the household and agriculture is the main source of income for most of the rural households in Karakalpakstan. On average, head of a household has about 24 years of experience in agriculture, which sounds good (Figure 3). The higher the experience the higher are chances that this quantity in years transforms into quality experience.

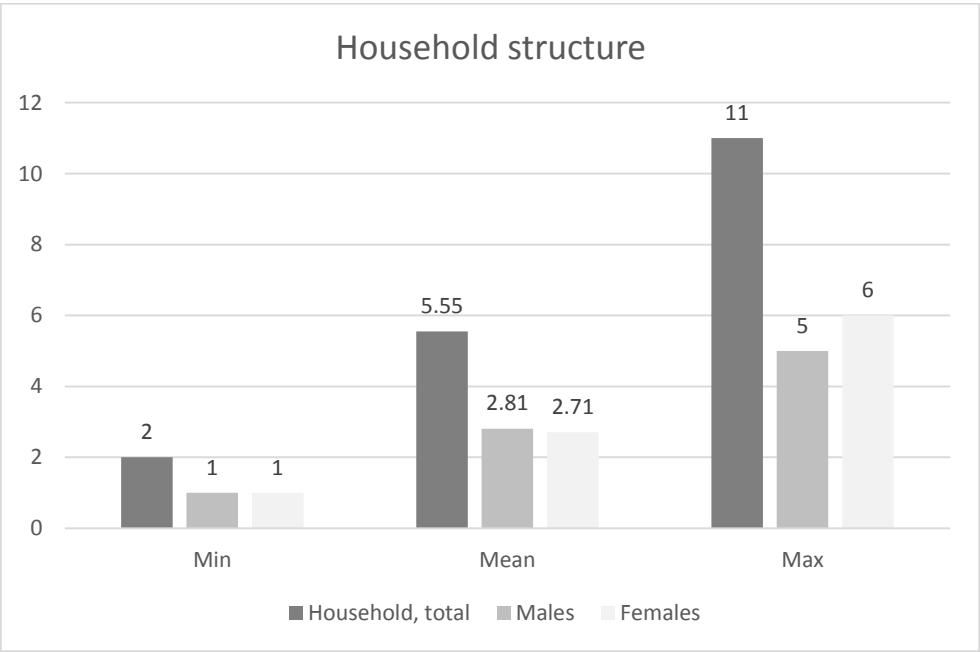

Figure 4. Household gender structure, members

Family size in rural areas of Uzbekistan and Karakalpakstan 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 surveyed households there are on average 5-6 family members (Figure 4). On the extreme edges households reported to have more than 10 family members (these would include elderly members – grandparents) and very few households have 2-3 members only (few cases of divorced families or families with widows). Average number of males and females in surveyed households is almost equal.

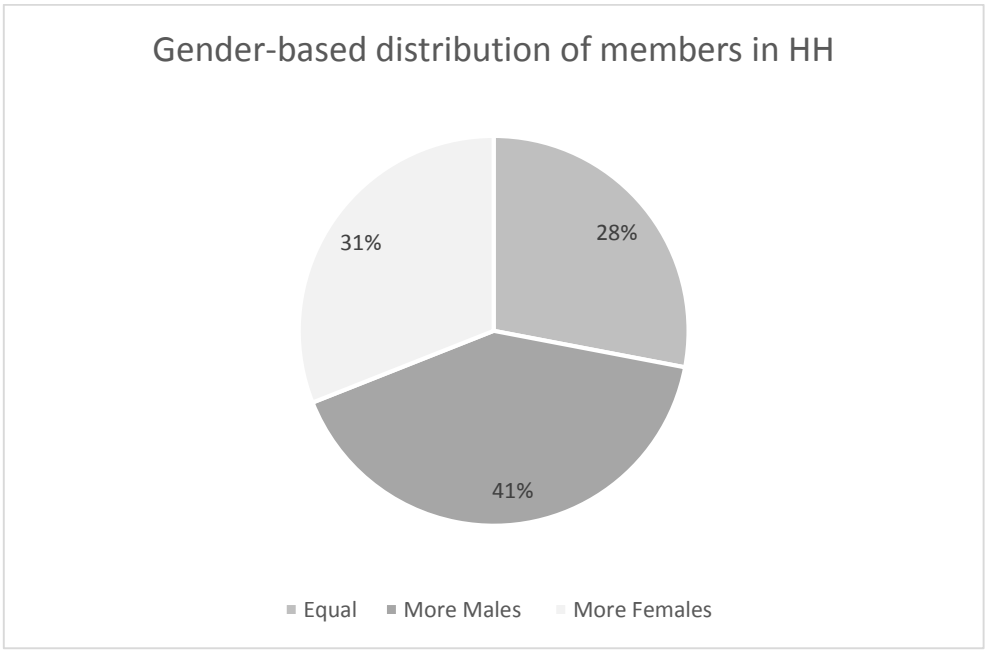

Figure 5. Gender-based distribution of households (HH), %

Figure 5 gives another perspective at gender structure in surveyed families. In 41% of households there are more men than women, and in 31% – women prevail over men. In previous figure we saw that average number of men and women in all families are nearly the same.

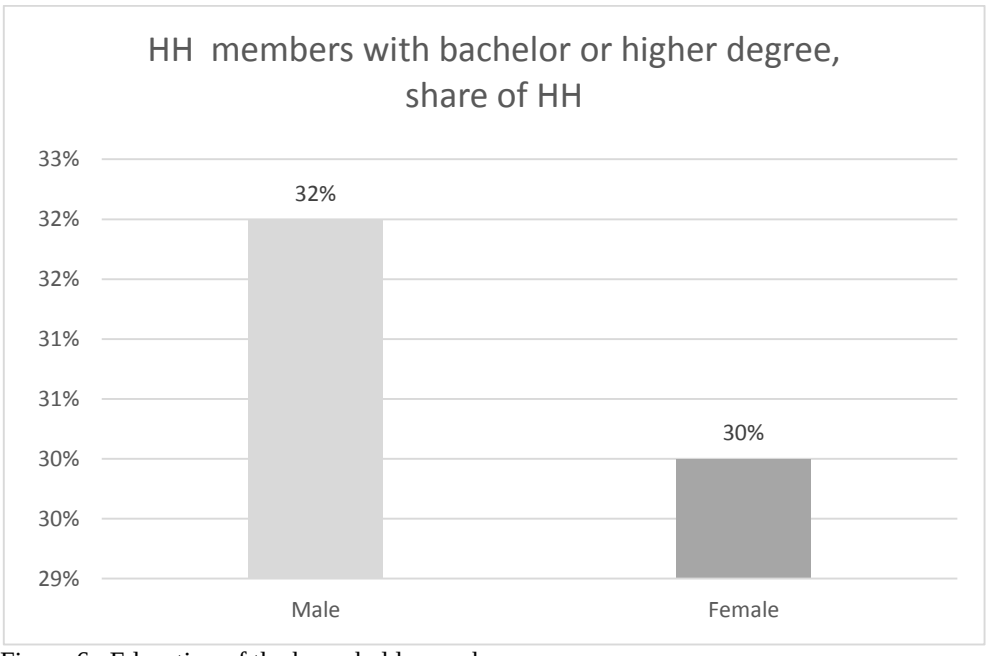

Figure 6. Education of the households members

Literacy rate in Uzbekistan and Karakalpakstan is reported to be 99%. Virtually all citizens throughout the country do have school education since primary and secondary education is mandatory and free of charge for everyone. 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 (Nukus 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.

In all surveyed households, eligible members (as per age) have at least a college degree (secondary education). Therefore, it is more appropriate to look at households where members have at least a bachelor's degree. Figure 6 shows that in 32% of households there is at least one male with a bachelor's or higher degree and in 30% - a female with the same degree. So, in terms of access to higher education there is no gender issue. It is prestigious to have a university degree in rural areas, and therefore parents support their children, regardless of sex, in entering the university.

5.2 Income structure and sources

The rural households in Karakalpakstan are net buyers of food products. 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. Questions on income sources are very sensitive to rural respondents in Uzbekistan. It should be noted, that most respondents unwillingly answered questions related to their income, especially regarding income amounts. Also, it must be noted than not all respondents answered the following questions on income. Therefore, analysis focused on relative values of income sources of respondents.

Table 7. Availability of out-of-residence income of the Household head

Household	Head of HH
number	19
share	19%

Only 19% of respondents indicated that the head of the household has to work outside of community to generate income. It might be a job abroad (labor migrant), in another city or province within a country (Table 7).

Table 8. Sources of households' income, share of households

Share of HH total income	Own land and livestock	Wage in agriculture sector	State salary or pension	Wage in private sector	Own non-agriculture business	Income from abroad migration
0%	54%	87%	9%	89%	100%	89%
1%-25%	24%	6%	3%	1%	0%	2%
26%-50%	15%	3%	26%	5%	0%	7%
51%-75%	5%	2%	7%	4%	0%	1%
76%-100%	2%	2%	55%	1%	0%	1%

There were specified six sources of income for surveyed households, including: (1) income from own land and livestock rearing, (2) wages in agricultural sector, (3) salaries and pensions paid by the government, (4) wages in private sector, (5) own non-agricultural business (small scale entrepreneurship) and (6) income from family member working abroad (Table 8).

Table 8 above gives data on shares of sources of income in total income of the households, structured by households that have particular source of income within given range in percentages. For example, 54% of households indicated that they don't have income from farming activities (own land and livestock). At the same time nearly 25% of households generate up to one quarter of their income from their land plots and livestock and only 7% of households heavily rely upon agricultural activities, that generate more than 50% of total household income. Not many household members have jobs at agricultural or private sector.

The main source of cash income for households is salary from state-funded jobs or pensions. There are two assumptions that come from this observation:

- Lack of rural jobs in non-state sector;
- Lack of monetization of small agricultural activity.

5.3 Social capital

Social activity and networking plays an important role in rural life.

Table 9. Leading position of the head of household

	Yes	No
Number of HH	4	96
Share of HH	4%	96%

Only 4% of households' heads have leading positions in a community. This means that these people are respected by most of the community members and their opinion is highly valued (Table 9).

Table 10. Participation of a member of HH public organizations/public funds

	Yes	No
Number of HH	10	90
Share of HH	10%	90%

There is no independent public organization/public fund operating in Karauzyak. Except for those that are established and monitored by the government at all levels, such as Farmers Council for example, Village Citizens Council. Only 10% of respondents acknowledged their participation in public organizations, by which they meant Village Citizens Council (Table 10). Village Citizens Councils in fact serve as a promoter of the government policy both local and state.

Table 11. Reliance upon state subsidy in case of the loss of harvest

	Yes	No
Number of HH	15	85
Share of HH	15%	85%

State subsidy exists for farmers that cultivate crops under state quota system, such as cotton and wheat. Climate change, Aral Sea disaster and seasonal water shortages derived from transboundary water supply problems make national agricultural sector vulnerable to potential natural risks. In order to protect the farmers from hidden natural and systematic economic risks Uzbekistan launched a special agricultural insurance scheme for farmers and households involved in small size family farming. Nowadays subscribers of agro-insurance scheme reached 66,000 farmers all

over Uzbekistan joined under UzAgro Insurance Company. However, none of rural households *dehqons* insure their crops for possible harvest losses.

Table 12. Availability of extension services in surveyed communities

	Yes	No
Number of HH	11	89
Share of HH	11%	89%

Outside wheat and cotton production, there is no extension service in Uzbekistan (UNDP, 2010). This was previously provided as one of the functions of the state and collective farms but was lost with their break up. A number of demonstration plots have been established, often with development assistance, as have some Rural Development Centres. There are also service providers in Uzbekistan which meet part of the demand from different sub-sets of the farming community. They typically offer advice and guidance at demonstration plots. Farmers are invited to visit the demonstration plots either on an ad hoc basis and/or on open days on which groups of farmers are invited. There are also a number of crop specific agricultural research institutes, many with branches in provinces experimental plant biology, plant protection, forestry; vegetables, melons and gourds; vine growing and wine making, natural fibres; Karakul sheep breeding; and sericulture. There are also branches of agricultural research institutes in the provinces. However, again rural households usually do not participate in extension services consumption. 10% of respondents said that there is an extension service provider, by which they meant Village Citizens Council. VCC usually disseminate some information on the upcoming agricultural activities, organized by local authorities, such as cotton productions (Table 12).

Table 13. Interest in extension services

Male			***Female***		
Topics	Number of HH	Share of HH	Topics	Number of HH	Share of HH
Efficient crop cultivation (land fertility, yield increase, etc.)	32	32%	Efficient crop cultivation (land fertility, yield increase, etc.)	17	17%
Protection from pests	9	9%	Protection from pests	16	16%
New sorts of crops	5	5%	Small household business (sewing, etc.)	2	2%
Irrigation	3	3%	Irrigation	4	4%
Livestock diseases	5	5%	Livestock diseases	7	7%
Energy sources supply (natural gas, electricity, water, alternative)	6	6%	Energy sources supply (natural gas, electricity, water, alternative)	4	4%

Respondents, both males and females, shared their interest in extension services via topics they would like to discuss with consultants. Most of the men (32%) and women (17%) are interested in topics related to efficient crop cultivation. These topics are interrelated and include “land fertility”, “crop yield increase”. Women (16%) were more concerned with specific issues of pest protection

than men (9%). At the same time some men (5%) would like to know about new sorts of crops and few women (2%) wanted to know how to start own small business, such as sewing. Women were slightly more interested in discussing issues on irrigation and livestock diseases than men. The last, but not the least were issues pertained to household energy supply. In rural households there are problems with natural gas supply, drinking water, and electricity supply. So, respondents were interested in alternative energy technologies (Table 13).

5.4 Natural capital

Natural capital of the household consists of the land leased from the state. 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*. 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.

Table 14. Data on plots owned by household

Indicator	Area, m^2
Number of HH	77
Share of HH	77%
Mean, m^2	1155
Max, m^2	5000
Min, m^2	24

In the surveyed group of households the same trend of land size was observed. 77% of respondents gave information about their plots. Average area of household plot among respondents is equal to 1,155 m^2, while maximum and minimal values of this indicator were 5,000 m^2 and 24 m^2 respectively (Table 14).

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.

Most of the land owned by respondents is cultivated via surface irrigation (87%). Few respondents have dry-farming (7%) and fallow (2%) land (Table 15).

4% of surveyed households happened to be also farmers, i.e. they have a farm land and are involved in farming activities. They grow cotton, wheat under state order, and other crops. Average area of these farmers is equal to 41.5 ha, whereas maximum is 100 ha. One farmer has fallow land, 94 ha (Table 16). This land is marginal and is not used for cultivation due to lack of irrigated water and high soil salinity.

Table 15. Structure of land owned by household

	Dry-farming land	Surface irrigation	Fallow	Total
Number of HH	7	87	2	95
Share of HH	7%	87%	2%	95%

Table 16. Land leased by household

	Dry-farming land	Surface irrigation	Fallow	Total
Number of HH	0	4	1	4
Share of HH	0	4%	1%	4%
Mean, ha	0	41.5	94	65
Max, ha	0	100	94	154
Min, ha	0	3	94	3

5.5 Physical capital

Table 17 contains data on property, one of the useful socio-economic indicators and the physical assets owned by households. Only few households (5 or 5%) own a tractor and they carry out farming activities. Even fewer households have water pumps. Cars are deemed as a mean of luxury and owned by 12% of households. Nearly all households own a TV, but just about a quarter of them have satellite antenna. Mobile phones are omnipresent nowadays, though three households don't have one. Refrigerator is present at little more than half of households (57%), though washing machine is available only in one household. This is because there is no centralized water supply system in given communities.

Table 17. Physical capital of the households

	Tractor	Water pump	Car	Grain storage facility	TV	Satellite antenna	Radio (audio) player	Mobile phone	Refriger ator	Washing machine	Carpet
Number of HH	5	2	12	14	97	23	25	95	57	1	93
Share of HH	5%	2%	12%	14%	97%	23%	25%	95%	57%	1%	93%

Average number of rooms in a household is between 5 and 6. However, more than half of households' rooms (65%) are without heating. More than half of respondents (63%) gave data on the area of their living space. And the average area of a household is about 105 m^2, whereas the minimum is 30 m^2 and maximum – 600 m^2 (Table 18).

Table 18. Data on household rooms

	Total rooms	Rooms with heating	Area of living space, m^2
Number of HH	100	45	63
Share of HH	100%	45%	63%
Mean	5.4		105
Max	9		600
Min	2		30

Traditionally, livestock are considered to be a good, reliable and fast paying off investment option. Many rural households, which plan to have weddings or other big celebrations or if the household has teenagers ready to attend or already enrolled at universities, the family can fast sell the cattle and get the required funds to cover expenses for celebrations or educational fees. Thus, 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 fodder availability.

Table 19. Livestock owned by household

	Milk cows	Non-milk cows	Bull	Sheep	Ram	Lamb	She-goat	He-goat	Young goat	Horses, mules
Number of HH	67	44	5	4	5	2	20	9	2	14
Share of HH	67%	44%	5%	4%	5%	2%	20%	9%	2%	14%
Mean	2	2	1	6	4	3	4	4	3	1
Max	5	4	2	10	15	3	15	16	3	2
Min	1	1	1	2	1	2	1	1	2	1

Most widespread kind of livestock among respondents in Karauzyak district of Karakalpakstan is milk cows (67%), since milk is a significant part of the daily nutrition of rural people. Non-milk cows are the second most popular animals and present at 44% of households. Among small ruminants the most widespread are goats, especially she-goats (20%). Sheep and rams are bred by few households and horses and mules are present at 14% of households (Table 19).

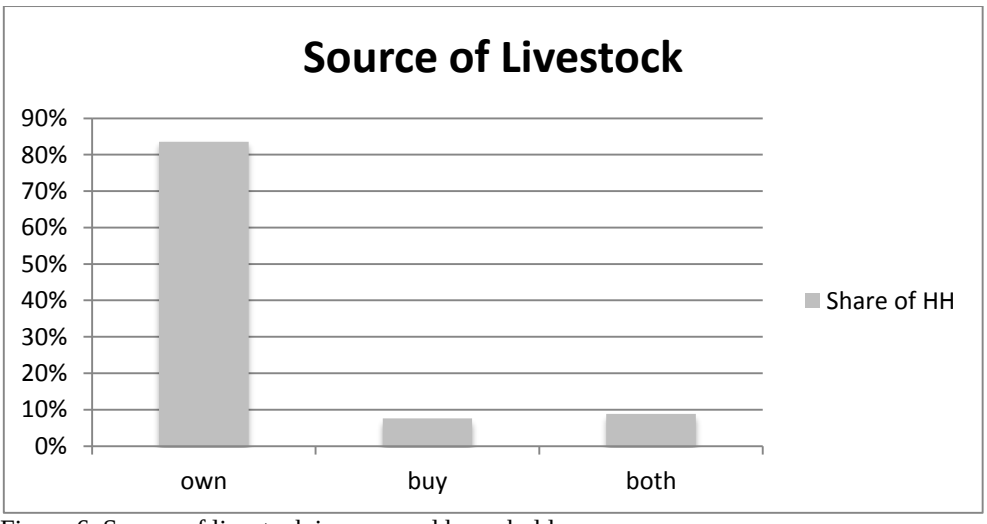

Figure 6. Source of livestock in surveyed households

In general, rural households (above 80% of the respondents) try to produce their own livestock, i.e. increase livestock herd by mating of animals. Few households (below 10%) reported purchasing of livestock heads at local livestock market (Figure 6).

Men play a primary role in sheep and goat production. The following Figure 7 outlines general responsibility share between men, women and children in households.

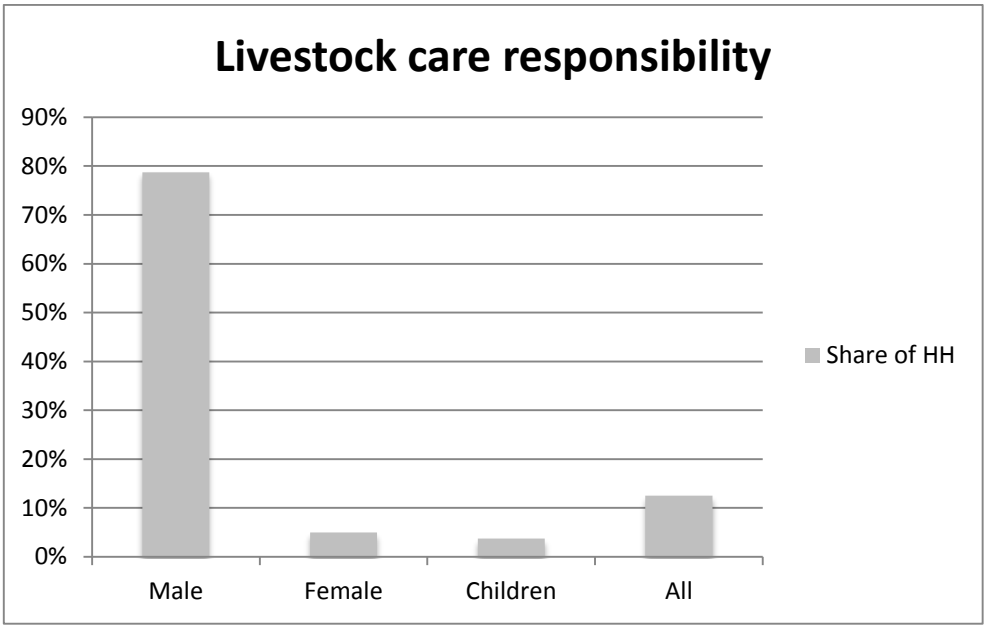

Figure 7. Household members responsible for taking care of livestock.

It is undeniable that men are key decision-makers regarding livestock production, in general (Figure 7). Almost 80% of the surveyed households reported that men decide on the breed and quantity of various livestock a household should rear. Also men are responsible for marketing of animals and consequently control the received revenues. Men also decide on what kind of feeds should be given to animals, though in the house, women and children mostly feed animals. Herding is done by men, but in some very rare cases children are involved too. Cleaning of animals is a prerogative of women and children. Women also solely do cow or goat milking and process milks. Though, very few households take advantage of goat milking.

Because of subsistence type of agricultural production of the surveyed households, many of the surveyed households possess poultry (chicken - 56% of the respondents, turkey – 11% or the respondents) (Table 20). Whereas virtually all households do keep cattle, the majority of the respondents mentioned keeping cows for own consumption of dairy products. The average number of chicken and turkey per household is almost the same.

Table 20. Poultry owned by household

	Turkey	Chicken
Number of HH	11	56
Share of HH	11%	56%
Mean	8	9
Max	18	20
Min	1	2

5.6 Agricultural Production

Crops are vital for households in rural areas of Karakalpakstan 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.

Households cultivate crops or keep cattle and poultry at their plots mostly for own consumption, very rarely they grow cash crops (cotton, rice or wheat) or sell dairy products.

Table 21. Cultivation of crops

	Cotton	Wheat	Beans	Vegetables	Watermelons	Fodder crops	Fruit trees
Number of HH	2	2	9	75	31	39	20
Share of HH	2%	2%	9%	75%	31%	39%	20%

Table 21 gives data on households that cultivate certain kind of crops. Two households cultivate cotton and wheat on the plots leased from the local farmer upon mutual contractual agreements. Since most of the households own small plots of land they usually cultivate food crops such as vegetables (75%), watermelons (31%), fruits (20%) and beans (9%). Households that have livestock cultivate fodder crops (39%) to feed animals (Table 21).

Table 22. Importance of Crop cultivation

Very important	Cotton	Wheat	Beans	Vegetables	Watermelons	Fodder crops	Fruit trees
Number of HH	2	2	2	64	20	36	13
Share of HH	100%	100%	22%	85%	65%	92%	65%

Generally, all cultivated crops were important for households, but they were asked to give the highest priority. All (100% or 2) households that cultivate cotton and wheat consider them very important for themselves. A little more than 20% of households that cultivate beans gave a high rank of importance to this crop. Fodder crops are of highest importance to 36 or 92% of surveyed households that cultivate them. Vegetables, watermelons and fruit trees are naturally very important for most of the households (Table 22).

Half of the respondents have fruit trees in their back yard gardens, providing essential fruits for own consumption. Fish keeping and bee keeping is not the types of agricultural activities widely practiced by rural households in Karauzyak district of Karakalpakstan, there were no respondents in the survey, which would grow fish or keep bees.

There are three possible reasons for cultivation of certain crops, including: (1) for own consumption; (2) for sale; (3) for feeding animals. Majority of the surveyed households cultivate food crops (vegetables, beans, fruits, etc.) for own consumption (Table 23a).

Table 23. Purpose of crop cultivation

a) Consumption

Household Consumption	Cotton	Wheat	Beans	Vegetables	Watermelons	Fodder crops	Fruit trees
Number of HH	0	1	8	74	29	6	18
Share of HH	0%	50%	89%	99%	94%	15%	90%

b) Sale

Sale	Cotton	Wheat	Beans	Vegetables	Watermelons	Fodder crops	Fruit trees
Number of HH	2	2	3	4	0	15	1
Share of HH	100%	100%	33%	5%	0%	38%	5%

Cotton and wheat are cultivated for sale to government under state order, this is however a biased answer and does not relate to the majority of rural households – *dehqons*, which are exempt from the state order system. The general trend is that few households sell vegetables (5%) and fruits (5%) in local markets. At the same time, beans and fodder serve as cash crops for 33% and 38% of surveyed households in Karauzyak district of Karakalpakstan (Table 23b).

Prevailing majority of the households (85%) cultivate fodder crops to feed their livestock (Table 23c).

c) For livestock

for Livestock	Cotton	Wheat	Beans	Vegetables	Watermelons	Fodder crops	Fruit trees
Number of HH	0	0	0	0	1	33	1
Share of HH	0%	0%	0%	0%	3%	85%	5%

Not many households practice new farming technologies. Crop rotation is the most popular agricultural method, which is used for all crops, with vegetables being the most (Table 24). Minimal tillage is the second most applied technique by surveyed households, especially regarding vegetables. Households also practiced planting trees around fields for beans, vegetables, watermelons, and fodder crops.

Table 24. Use of farm methods by crops, number of households

Farm methods	Cotton	Wheat	Beans	Vegetables	Watermelons	Fodder crops	Fruit trees
Terrace				2			
Crop stubble			1	2	3	2	
Patch				7	3		
Tree planting around field			3	5	4	5	
Zero tillage							
Minimal tillage			1	21	3		3
Contoured cylinders							
Stone cylinders							
Raised bed and furrow planting							
Prevent grazing after harvesting					1	1	
Crop rotation	2	2	6	34	21	4	8

5.7 Access, quality, amount and management of water resources

Livestock requires considerable water for drinking purposes. Table 25 reflects respondents' approximate estimates of how much water is used annually for their livestock. On average 5,5552 liters of water is needed to provide 1 head of livestock with drinking water per year. The skewed answers come from the fact that livestock, especially small ruminants graze all year round in Karakalpakstan and drink water from open sources such as river, channel, ditch or lake. Thus households cannot accurately measure overall annual water use by animals. In cold seasons, when animals are kept in stables, usually up to 20 litres of water (2 pales) are given to each cattle head, which should make 7,300 litres per cattle head per year.

Table 25. Water used for livestock, amount

Water amount for Livestock	Litre, 2014
Mean	5,552
Max	65,000
Min	300
Median	2,000

The majority of surveyed households use channels as a main source of water for their livestock. Wells are used by 17% of households. Few households use artesian well and ponds for livestock (Figure 8).

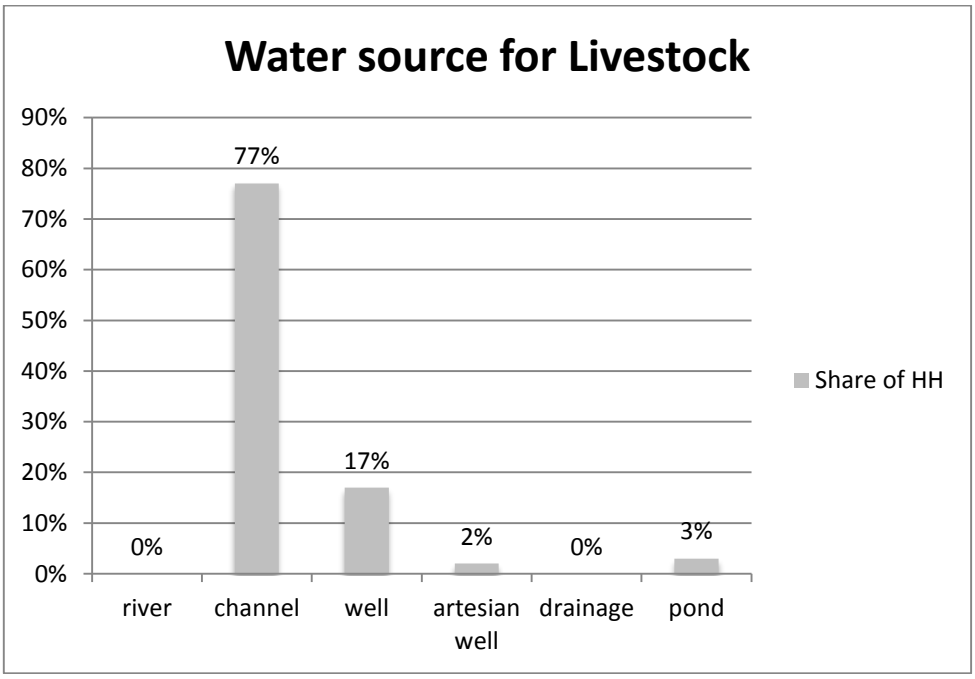

Figure 8. Water source for livestock

Over one third of households do not know the quality of drinking water for their livestock, whereas about half of the respondents considered water quality as "drinking" for livestock; 16% of respondents assessed that water as salty (Figure 9).

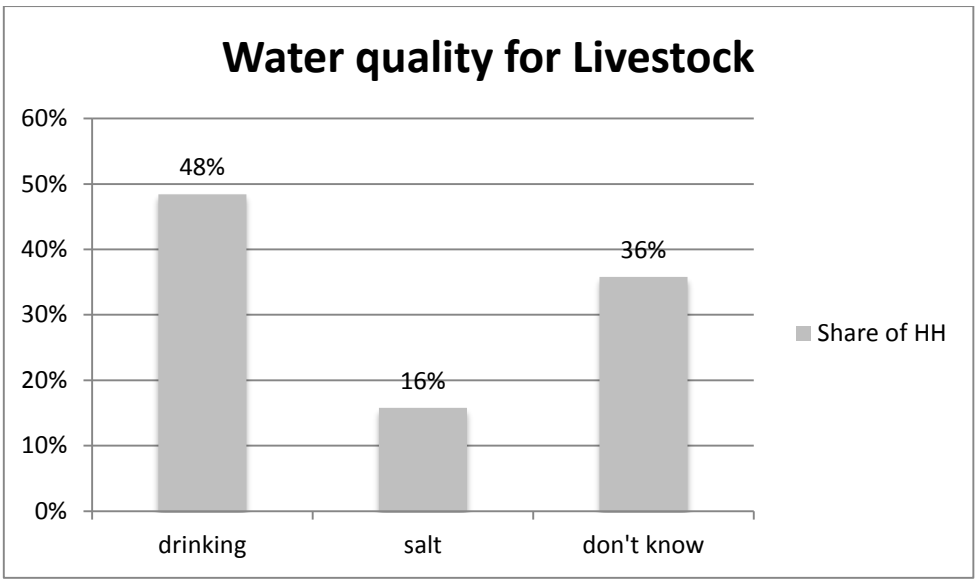

Figure 9. Water quality for livestock

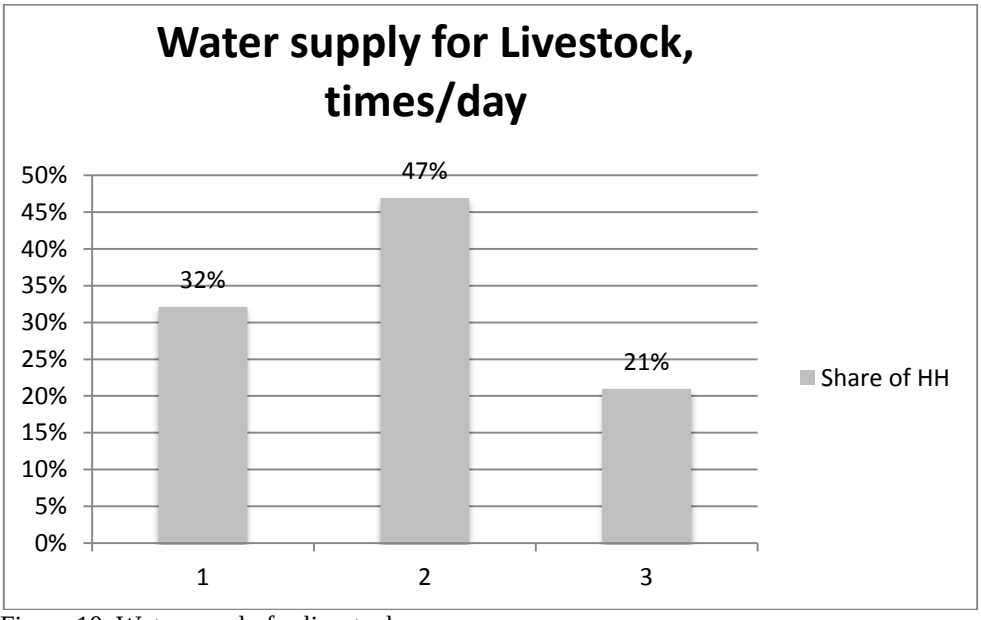

Figure 10. Water supply for livestock

Nearly half of surveyed households give water for livestock two times per day, whereas one third of give water once a day. 21% of households give water to livestock three times each day (Figure 10).

5.8 Livestock production and management

There is a variety of fodder sources available in the rural area. The fodder base for livestock in Karakalpakstan comes from three main sources:

1. natural grazing lands of deserts and foothills;
2. sown and improved pastures;
3. fodder saved or purchased for additional feeding in critical periods

Livestock owners in Karakalpakstan mostly practice grazing in pastures, since it is free and available during most of the year. In addition, they use stall-feeding. It happens that in the off-season (winter and early spring) households experience fodder shortage, and have to buy the required amount and type of fodder at local markets. This happens more with poultry, but also with cattle, since the households have to buy cotton husk and meal for supplying their cattle with protein fodder type. In rare cases, households members working in big farm fields get some fodder (wheat barn, wheat straw) as labour remuneration. It has to be stressed that all rural households including the surveyed ones use a combination of fodder types and not only one type.

In general for Karauzyak district of Karakalpaksan, public (in some occasions farmers owned) pastures are one of the primary source of feeds for livestock (Figure 11). Other sources of feed include cultivated fodder crops (jugara, maize, sorghum, etc.), cereal brans, purchased cotton cake (oilseed cake), collected green forage (grass, weeds, etc.), and straw (rice, wheat).

The main fodder market is located in Karauzyak district center and is in operation on Wednesdays. It brings together sellers of various fodder types from hay to grain and husk. Prices vary depending on the season.

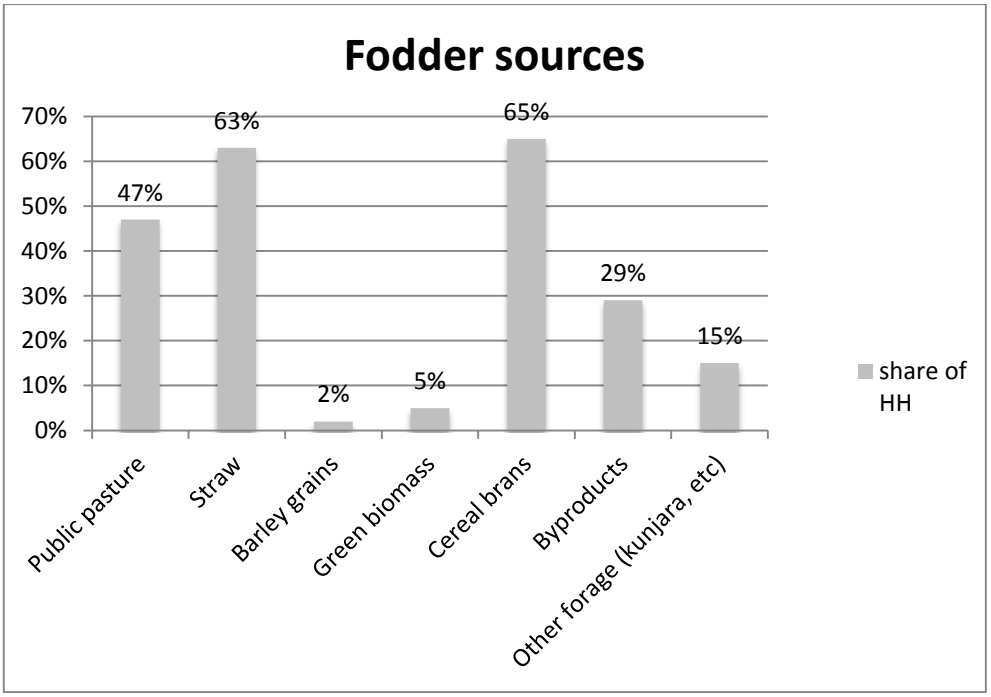

Figure 11. Fodder sources

Provision of fodder relies on several sources:

- collected and dried wild grass (jantak, licorice biomass (not roots);
- produced fodder crops (sorghum, maize, lucerne);
- produced by-products of agricultural crops (wheat and rice straw, bran);
- purchased dry wild grass;
- purchased byproduct fodder (cotton cake and meal, husk, grain fodder mix, feed compound (mixed feeds).

Production of own fodder is problematic despite of vast agricultural lands due to unreliable irrigation water supply. There is usually an irrigation channel in villages, but numerous pumps (electric or diesel) are required to convey the water to the fields. Thus in the times of electricity cuts or high prices for diesel, irrigation of fields becomes expensive or just not possible.

Seasonal availability of feed is negatively correlated with seasonal rainfall. It is because during summer, pasture is the primary source of livestock feed and this season is very dry. In other seasons, availability of feed sources is regarded as satisfactory.

Since not many of surveyed households purchase livestock, but rather try to increase livestock herd by mating own animals, the practice of putting new purchased animals to quarantine before letting to the rest of the herd is practiced by only slightly over 20% of the surveyed households (Figure 12).

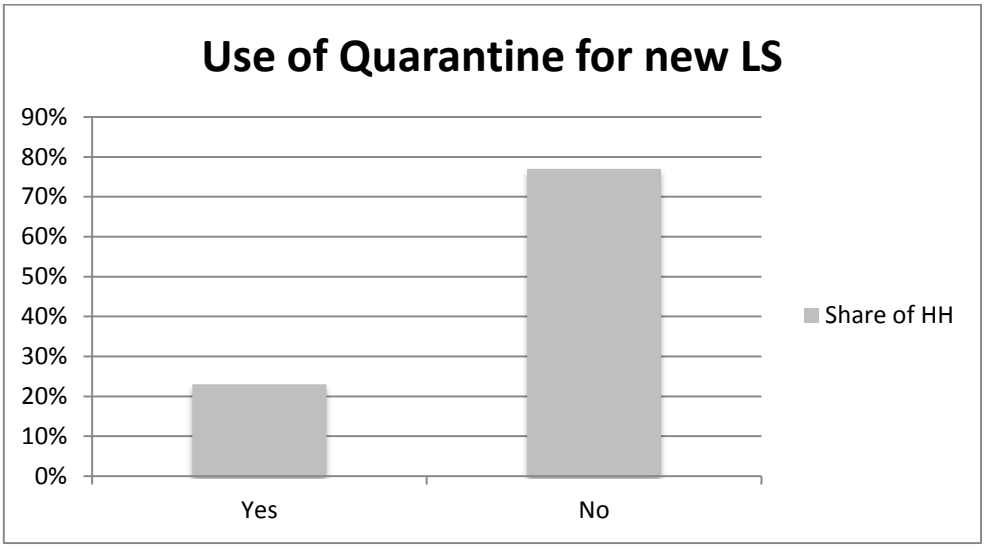

Figure 12. Management of livestock newcomers

State veterinary service exists in Karauzyak and its branch office is located in the centre of the district. Interviewed households didn't indicate the availability of private veterinary services. However, the head of the state veterinary service said that there was one private medical unit in Karabuga village, which provides veterinary services too. None of informal veterinary services are available in Karauzyak.

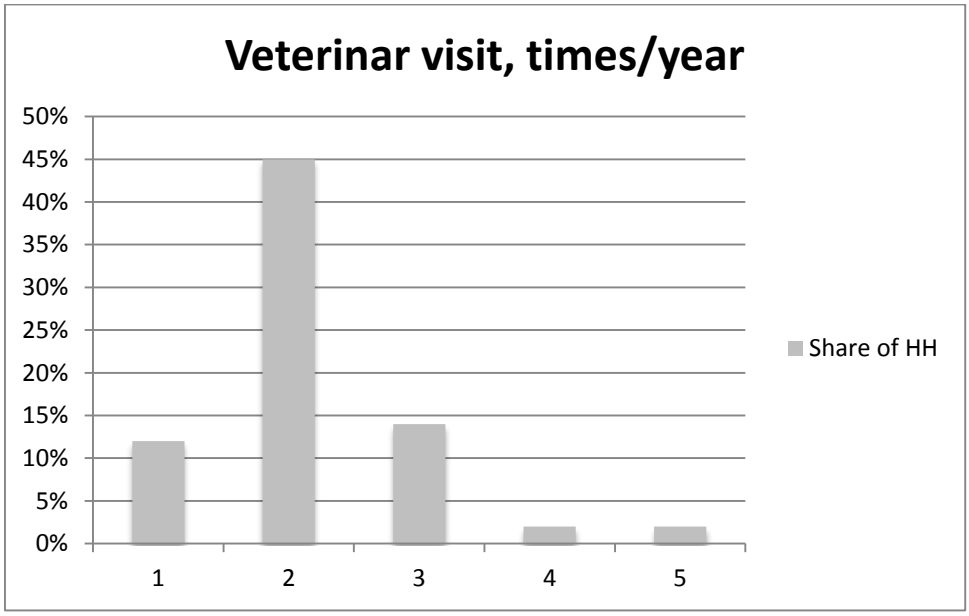

Figure 13. Visit of veterinary specialists in surveyed households

State veterinary service has a calendar plan of activities, of which households in villages are informed at respective village community offices. This plan includes free of charge vaccination of all households livestock against anthrax. Small ruminants are vaccinated twice a year, whereas cattle are once a year. According to the respondents, veterinary specialists do not provide/distribute vaccination calendars. About half of the respondents reported 2 visits of veterinary specialists per year, whereas 10% of respondents see vet specialists once a year and about 15% of respondents – 3 times per year (Figure 13).

Respondents shared generally positive views on the quality and affordability of the veterinary services provided. However, they have no other choice and have to deal with whatever service the state veterinary office provides them. Still, some local residents in surveyed villages pointed out that they had to go to the centre of Karauzyak and spend time and money to get veterinary service. On the contrary, other respondents said that they could phone call and summon veterinary service specialist to the village, though it remains unclear who covers round-trip transportation costs.

Surveyed households pointed at self coping strategies in case of lack of or late veterinary services. These strategies include purchasing vet drugs and medicine in special vet drugstores (in Karauzyak or Nukus) and curing animals by own means. Generally, vet drugs are of Uzbek production and trademark with sufficient quality. Imported vet medicine is rare.

Mostly, local livestock owners are concerned with a timely identification and effective treatment of the animal diseases. Over two thirds of the surveyed households reported to be aware of various animal diseases and about possible curing methods (Figure 14). Most of households do acknowledge the importance of livestock vaccination against widespread animal diseases.

According to vets in Karauzyak district, the provided quantity of vaccines is not sufficient for all animals due to their unreliable livestock recording in *dehqons* farms, which is managed by VCCs. As a result, some part of livestock is left without vaccination that weakens animal immune system and cause diseases. Also, according to the experts, the vaccine itself is ineffective in many cases or insufficiently effective – probably due to poor drug packaging. Most of *dehqons* and livestock breeding farms do not face any difficulties with getting vet services, except for several respondents mentioned lack of needed vet drugs and their high cost.

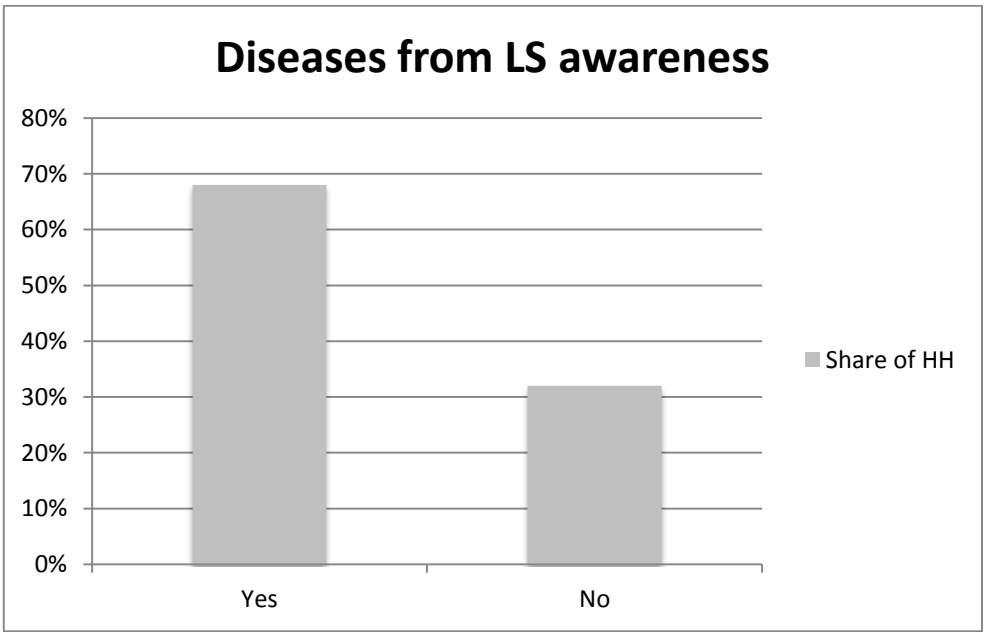

Figure 14. Awareness of rural households on livestock diseases

5.9 Agricultural markets and food safety

Market is the main transaction place for most commodities in Karakalpakstan, and retail shops have been scarcely developed particularly in rural area. Nukus Central Bazaar (so called Dehqon Bazar) is the largest bazaar in Karakalpakstan, and most districts have central and local (satellite) bazaars, in order to give producers and local residents better access. In recent years, the number of retailers at major District Central Bazars are increasing due to the lack of employment opportunities in rural areas, resulting in congestion of retail sections.

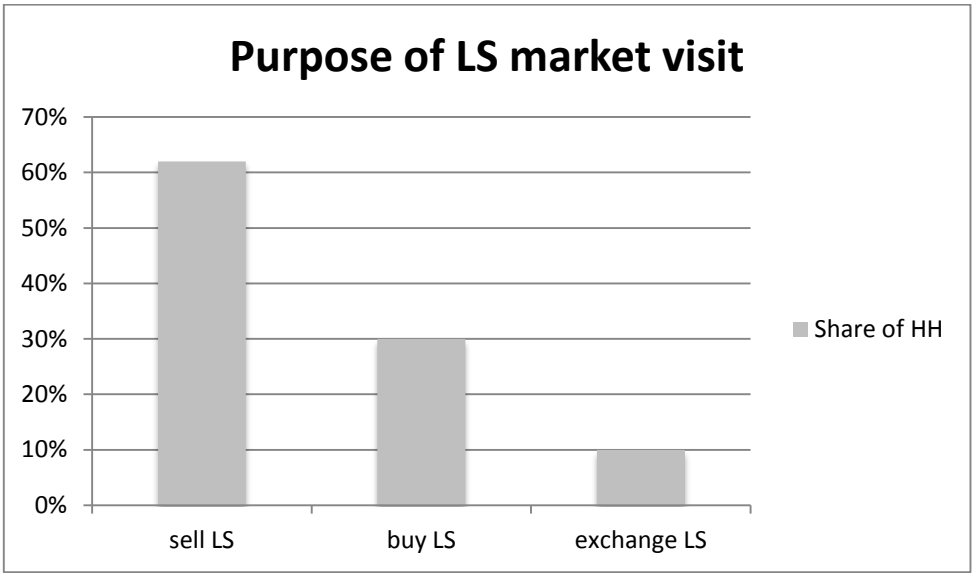

Figure 15. Reasons of households to visit livestock market

Trade is subject to seasonality resulting in variations in number and specifics of products traded and prices paid. Market prices of most agricultural products are determined by direct transaction and depend on the number of seller and resellers in a given market day. They increase demand and push prices up.

There is one market in Karauzyk district, open every Wednesday and located in the district center (25 km from “Karabuga” and ca. 20 km from “Algabas”). The market has separate divisions for food products market, clothing market and livestock market.

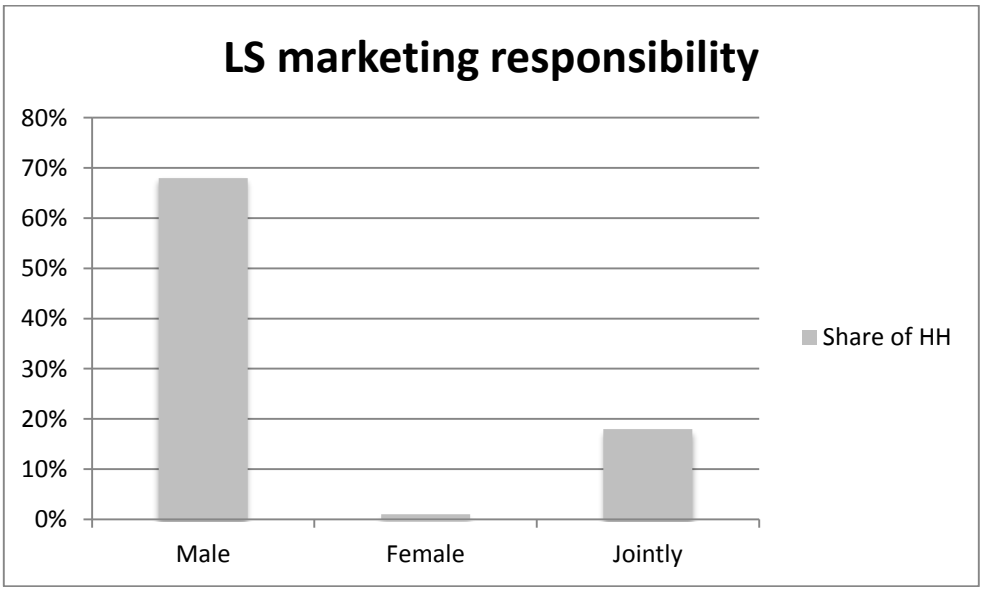

Figure 16. Households members responsible for livestock marketing

Rural households visit local livestock market basically for selling their livestock (Figure 15) in anticipation of big family events (such as weddings, festivities, etc.) as to get cash. Again, survey showed that livestock trading is the prerogative of men in 70% of surveyed households (Figure 16).

The general 'food security' habit of the population and the more so of the rural population (due to the availability of storage facilities compared to urban population living in apartments) is to prepare/store sufficient amounts of the main food items (wheat, potato, other vegetables, fruits, processed/canned/dried fruits and vegetables, flou) for the winter-spring seasons. The underlying reasons are price fluctuations – price increase for many products during winter and early spring, the lack of good quality products in winter at the market place and the reluctance of family members to go to markets during the cold winter days. 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.

The food items which households store during the winter are either home produced or purchased from local markets in autumn, right after the harvest (for vegetables and fruits). Again, almost all households do both strategies – produce certain amount themselves and purchase the missing amounts from the markets. Vegetables and processed fruits and vegetables are more home produced than purchased, fruits are half grown at own plots and the remaining required half comes from markets, wheat and potato is also more home produced, whereas flour comes in most cases from the traders.

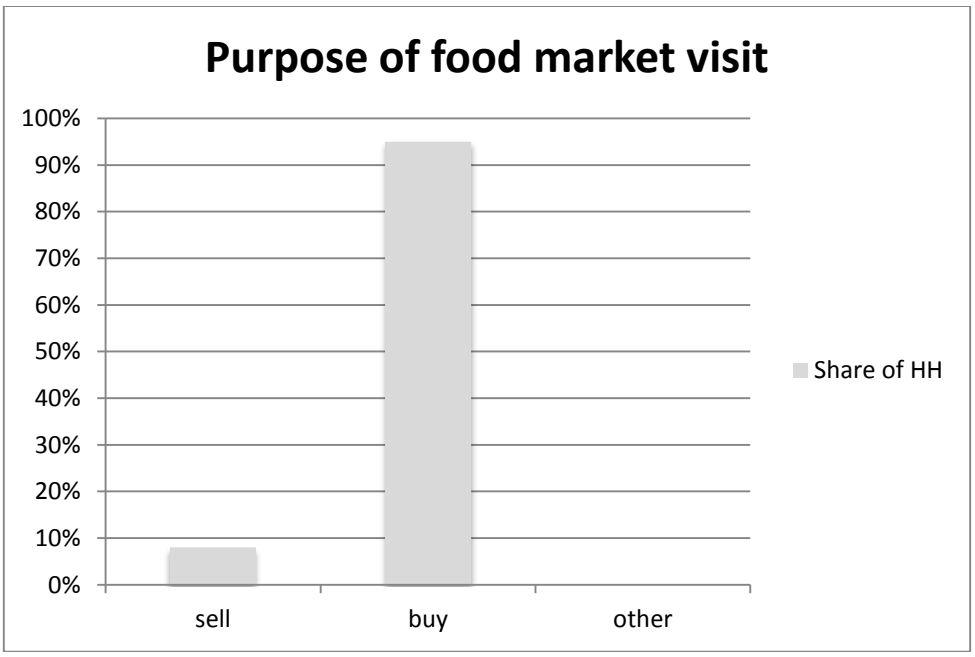

Figure 17. Reasons of households to visit food market

Virtually all surveyed households reported to go to local food market to buy some food stuff either not produced by own means, or produced in low amounts, insufficient to cover respective household requirements (Figure 17). Still some below 10% of the respondents visit market with the purpose to sell some products they produced in excess (basically in autumn, right after harvesting). Basically women are responsible for buying food stuff for the families (Figure 19).

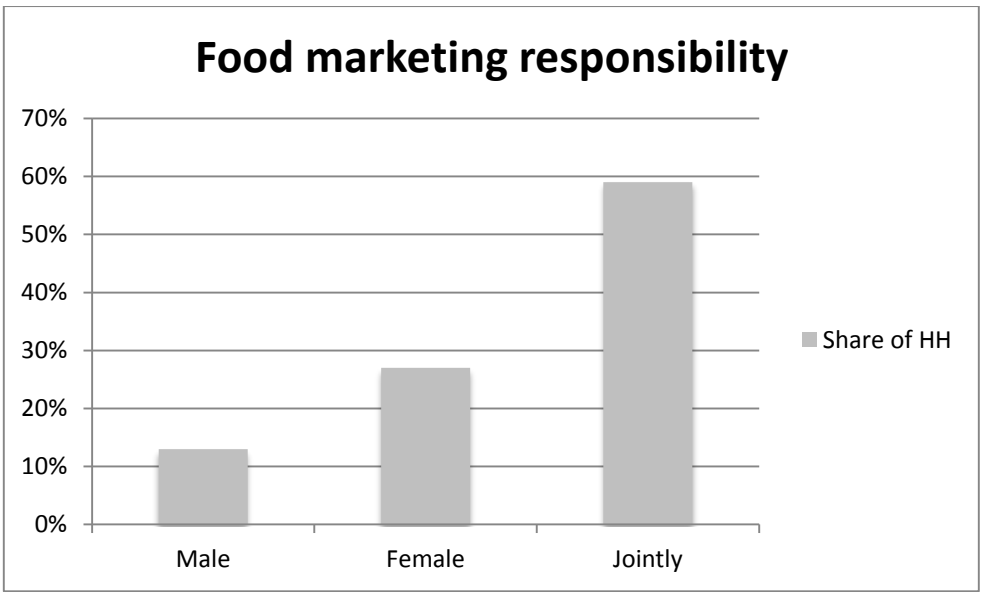

Figure 18. Reasons of households to visit food market

5.10 Access to food and survival strategies

Enhancing food security is one of the key challenges that impacts livelihood strategy of rural households. Respondents were asked to estimate their concerns over food availability in their households within month and describe strategies they used to overcome issues with food security.

Table 26. Concern over food availability within the month for households

	Yes	No
Number of HH	67	33
Share of HH, %	67%	33%

Table 26 shows that 67% of households has to worry if they are capable of securing sufficient food products every month.

Table 27. Consumption limit within households due to lack of food

	Yes	No
Number of HH	37	63
Share of HH	37%	63%

As a response to food shortages, 37% of households' members limit consumption of food products so that children needs fully met (Table 27).

Households applied different strategies to mitigate or resolve issues with food products availability during last 30 days (Table 28). The most applied strategy is to get food for debt from local shops or get help from relatives, friends or community members – 57% of households rely upon this. Another way of dealing with this issue was to spend savings for food, which is applied by 45% of households. In a little more than quarter of households (27%), elder members consumed less food so that children could have enough food. Nearly quarter of households (24%) met their demand for food at the expense of decreasing healthcare costs. The same number of households sold poultry for this reason. There are households that had to sell small ruminants (18%) and cattle (11%) to buy food.

Table 28. Survival strategies of households due to weak food safety (last 30 days)

Strategies	Number of HH	Share of HH
Food for debt, help of relatives, friends, community	57	57%
Grown-ups eat less for children to eat more	27	27%
Purchased seed stock was stored for the next season	5	5%
Children were sent out to live with relatives	1	1%
Barter to buy more food	5	5%
Use of savings to buy more food	45	45%
Decrease expenses on healthcare, education	24	24%
Sale of poultry	24	24%
Sale of house assets (appliances, dish, etc.)	1	1%
Sale of small cattle	18	18%
Sale of cattle	11	11%

Table 29. Decision on household survival strategy choice

	Number of HH	Share of HH
Men	15	15%
Woman	7	7%
Jointly	78	78%

In the most of surveyed households (78%), family members decide together on how to deal with food security issues. Only in 15% of households men decide which strategy to choose, and in 7% of households – women have final say over this matter (Table 29).

Table 30. Three primary sources of food for the last 30 days

	Source #1	Source #2	Source #3
Own production	6%	28%	6%
Livestock sale	9%	6%	9%
Trade/small business	1%	1%	2%
Wages, pensions, subsidies	72%	15%	2%
Private work income	9%	7%	1%
Money remittances	3%	5%	3%
Community aid	0%	0%	4%
Help from relatives, friends	0%	0%	0%

There are various sources used to get food. Respondents ranked three primary sources in order of their priority to household choice. The most primary source was budget receipts: wages, pensions and social security payments – 72% of households used this money as Source #1 to get food within last 30 days. 9% households use income from the sale of livestock and private work as primary sources for getting food. Few households (6%) primarily rely upon own production (vegetables, fruits, etc.), whereas 28% of them use "own production" as a secondary source. Money remittances are primary source for only 3% of households; 5% and 3% rely upon money transfers from abroad as their secondary and third source (Table 30).

Table 31. Season when households sharply feel the lack of food

	Number of HH	Share of HH
Winter	7	7%
Spring	90	90%
Summer	2	2%
Autumn	1	1%

This table 31 clearly shows that the most challenging season for households is Spring. During this season 90% of households are exposed to financial issues with access to food.

Table 32. Funds sufficiency for buying quality food

	Yes	No
Number of HH	50	50
Share of HH	50%	50%

Table 31 confirms that households struggle to get full access to food. Half of respondents acknowledged that their households experience financial problems to buy quality food in the amounts they need.

5.11 Access to financing and loans

There are only two branches of commercial banks located in the centre of Karauzyak district: Agro Bank and Halk Bank (People's Bank). None of formal credit organizations are present at any of the villages in Karauzyak district. Interviewed respondents didn't indicate any primary informal credit source they could get large amount of funds from, based on interest rate. Nevertheless, local people in both villages borrow from each other small amounts of money, but not on a regular basis. However, there exist couple of retail shops in both villages where people get food or other products on "credit", which means that they repay the costs later at the end of that month when they have cash or funds on their plastic (debit) cards. In general, a district bank is the primary official source where local people seek money to borrow.

The client base of these two banks in Karauzyak differs in that Agro Bank serves farmers among other clients, meanwhile Halk Bank doesn't have farmers among its clients. The reasoning behind this phenomenon is that traditionally Agro Bank was established to serve agricultural sector and Halk Bank mostly attracts deposits from ordinary citizens.

Both banks have several credit lines, including: (1) a 3-year soft (micro)credit for livestock breeding at 9-10% annual interest rate; (2) youth credit at 14% annual interest rate; (3) consumer credit at 17% annual interest rate; and (4) commercial credit at 18-19% interest rate. Soft credit lines (1-3 above) do not require business plans, whereas commercial credit can be issued only upon a well-structured business plan.

Bank staff conducts propaganda or awareness creation campaigns on the availability of crediting options at schools, institutions, state organizations and VCC offices in rural areas. Halk bank has prepared special brochures devoted to soft credit lines, which bank staff distributes to the interested people.

Some years ago, VCCs helped the poor and underprovided households by providing live sheep and goat.

General features of credit terms and conditions

All banking loans are required to be issued under conditions of return, solvency, provision, timeliness, and purpose, as per instructions of CBU. These general conditions mean that, before issuing a loan, a bank must duly check and verify that a recipient meets all requirements for a specific loan. As of rule, a bank must ensure that a recipient is able to repay a loan in full amount with interest payments and in due time. In addition to relying upon recipient's solvency, a bank secures its loan by requiring that a recipient must provide either a collateral/mortgage or warrantor(s), who will be responsible for repayment of the loan in case of the applicant's insolvency. Specifically, conditions differ depending on the amount of the loan and its purpose in each case. The higher the amounts of a loan, the stricter are the terms and conditions for a recipient. As an example, below are outlined terms and conditions for getting a microloan for livestock purchase in Karauzyak banks.

The list of documents required for application for a microloan was obtained from Halk Bank. So, a member (loan recipient) of a rural household should provide the following documents (if applicable) for microloan application:

1. Copy of the passport.
2. Reference from a local community office (*mahalla* or VCC*)* on the residence certification.
3. Income reference from employment place.
4. Copy of the Tax ID.
5. Copy of the pension book.
6. Warranty letter from the employment place.
7. Warranty depending on the amount of the microloan:
   7.1 Up to 3 mln. UZS – 1 warrantor (passport copy, income reference, reference from local community office, pension book copy, TAX ID copy);
   7.2 3 to 5 mln. UZS – 2 warrantors (passport copy, income reference, reference from local community office, pension book copy, TAX ID copy);
   7.3 More than 5 mln. UZS – collateral by the recipient.
8. Contract between a loan recipient and an agrofirm, which sells sheep or goat.
9. Open an account and deposit 10% of the microloan amount to the bank.

Table 32. Decision making on the loan

	Number of HH	Share of HH
Men	22	22%
Woman	9	9%
Jointly	69	69%

Generally decisions on getting a loan are made jointly (69%) by family members, both male and female. Though, in 22% of interviewed households these decisions are the prerogative of men, and in 9% of cases – women have a decisive power (Table 32).

Table 33. Availability of reliable sources of borrowing in case of need

	Number of HH	Share of HH
Yes	68	68%
No	32	32%

More than half of respondents conformed that they have reliable sources of financing in case they need it. Usually these reliable sources consist of relatives and friends.

Table 34. Sharp lack of money for small agricultural production

	Number of HH	Share of HH
Yes	80	80%
No	20	20%

Table 35. Months when households experience the lack of money

	Number of HH	Share of HH
Jan-Mar	10	10%
Apr-Jun	76	76%
Jul-Sep	13	13%
Oct-Dec	0	0%

Prevailing majority of households (80%) experience acute shortage of money for agricultural production (Table 35). Concurrently, lack of money is very critical during months in between April and June inclusive for majority of households (76%), that's when households mostly need funds for own agricultural production as well as buying food.

Table 36. Any member that received money/loans from any of the sources for agricultural and livestock production (last 12 months)

	Number of HH	Share of HH
Yes	21	21%
No	79	79%

Table 37. Structure of loans (formal and informal) that households received

Source of loan	***Cash***	***Food***	***Seeds***	***Fertilizers***	***Education***
Bank	0%	0%	1%	1%	1%
Local creditors	5%	8%	0%	0%	0%

Neighboring farms	0%	0%	0%	0%	0%
Non commercial organizations	0%	0%	0%	0%	0%
State	0%	0%	0%	0%	0%
Relatives	9%	0%	0%	1%	0%
Total	**14%**	**8%**	**1%**	**2%**	**1%**

About only one fifth of respondents (21%) revealed that they received a "loan" (Table 36). Most of them come from unofficial sources as given in the Table 37. 14% of households prefer to borrow money in cash, 8% - buy food in local shops for debt and repay the debt at the end of each month. One farmer, who cultivates cotton, gets loan from a bank for purchasing production inputs such as seeds and fertilizers.

Challenges in official credit provision and access.

In general the main challenge in accessing credits lies in burdensome application procedure, which requires many documents, the time and efforts to collect these papers.

There are two requirements that limit the access to credit resources in Karauzyak:

1. In order to receive a loan from a bank, a recipient must have an official job and submit a reference on his income. Unemployment is rather high in rural areas and if an unemployed wants to start a small business with livestock, he just can't get a credit for that initiative.
2. Shortage of cash. Some local people, who work at public organizations, such as schools and hospitals, and who receive pensions, complained that they are forced to get their wages in noncash on plastic cards. It wouldn't be an issue since formally current laws guarantee that anyone can withdraw cash from bank in full amount available on his/her plastic card. However, in practice it is not always feasible. Banks always refer to the shortage of cash and plastic cardholder can withdraw only a small amount of cash per visit to a bank. This issue leads to two negative consequences for all people, who have plastic cards:

   2.1 Sometimes it is simply impossible to buy some products non-cash. For instance, in Karauzyak livestock market, one can purchase, i.e., a sheep only for cash. The same is true for other agricultural products such as vegetables, potatoes, beans, etc.: local households don't sell it for noncash.

   2.2 Second outcome arises when the product could be purchased both for cash and noncash. But, if a seller in a market agrees to sell a sheep, i.e., for noncash then the price will be undesirably higher than that for cash. In general, the average spread between cash price and noncash price is between 10-20%. So, we can assume that the value of income accumulated in plastic card decreases automatically by 10% at least.

These consequences are especially acute in rural areas where local markets mostly accept cash payments.

5.12 Vulnerability of agricultural production system and local mechanisms of household decision-making

Agricultural production systems are vulnerable to numerous factors: natural, financial, institutional, and others. Table below gives an overall picture of negative factors that occurred within last 10 years in Karauzyak as per opinions of respondents. Also this table gives information on household adaptation strategies in response to above-mentioned factors.

Table 38. Primary problems for the last 10 years and household adaptation strategies

Problems	Yes	Did nothing	Left land under fallow	Sold part of the land	Leased/rented part of the land	Sold livestock	Additional irrigation	Invested in ponds	Changes in crop cultivation	Applied improved crop cultivation methods	Collected additional information	Other adaptation measures	Changed planting schedule	Used drought-resisting crop	Changed livestock structure	Borrowed money from relatives/others	Relied upon state/non-commercial aid	Bought less food and changed nutrition	Switched to non-agriculture job	Migration	Other
Draught	83%	61%	8%	0%	1%	0%	9%	0%	0%	0%	0%	0%	1%	3%	0%	0%	0%	0%	0%	0%	0%
Hail	10%	10%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Flood	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%
Livestock diseases	52%	26%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	0%	3%	0%	0%	0%	0%	0%	20%
Out-of season raining	42%	35%	0%	0%	0%	0%	0%	0%	0%	1%	0%	1%	4%	0%	0%	0%	0%	0%	0%	0%	2%
High temperature fluctuations	96%	96%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Low temperature fluctuations	77%	74%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Pests damage crops	67%	53%	0%	0%	0%	0%	0%	0%	1%	2%	0%	1%	0%	0%	0%	0%	0%	0%	1%	0%	5%
Family member disease due to extreme weather conditions	25%	25%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Changes in the soil salinity level and increase/decrease of soil humidity	23%	15%	0%	0%	0%	0%	4%	3%	1%	0%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%
Main changes in the structure of crops	10%	2%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
Main changes in the livestock	3%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%

Main changes in the agricultural investments (capital)	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Crop yield decline	34%	8%	0%	0%	0%	4%	3%	0%	11%	2%	0%	0%	0%	1%	0%	1%	0%	0%	3%	0%	0%
Groundwater depletion	12%	12%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Loss of income	31%	14%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	6%	0%	0%	7%	0%	2%
Food instability, insecurity	17%	5%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	1%	1%	0%	0%
Livestock death	19%	18%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%
Decline in consumption	15%	12%	0%	0%	0%	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	0%	1%	0%	0%
Worsening of the health	28%	6%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	22%
Significant changes in agricultural taxation	9%	9%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Significant changes in agricultural reforms	9%	4%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%

To the most of natural factors such as high and low temperature frequencies, households didn't develop a response strategy (Table 38).

Draught (83%) is one most severe factors that significantly affect agricultural production in conditions of irrigated system. 61% of respondents couldn't find an optimal strategy to fight with this problem. However, some proactive households try to cope with this factor via using additional irrigation (9%), leaving land under fallow (8%), using draught-resistant crops (3%).

Another most widespread negative factor is crop damage by pests (67%). Here too, most of the households just let this problem alone and don't do anything about it. Very few households try to apply improved crop cultivation (2%), make changes in the crops structure (1%), use pest protection means (5%).

Livestock diseases took place frequently nearly in half of households (52%). Most of the households used veterinary services (20%) and few households changed their livestock structure by replacing weak animals with more diseases-resistant ones.

6. Conclusions and recommendations

Under the severe climate of cold winter and hot summer, the productivity of crop, livestock and fishery in Karakalpakstan are low. Reflecting such conditions, the level of livelihood in the area is also low and the area is considered to be one of the most depressed regions in the Republic of Uzbekistan. Gross Regional Production (GRP) of Karakalpakstan in 2014 amounted to 3,632 billion UZS, which constituted ca. only 2.5% of the GDP of Uzbekistan. GRP per capita in 2014 in Karakalpakstan was 2,047 thousand UZS. Average monthly salary in 2014 hardly reached 211 thousand UZS (one of the lowest economic indicators in Uzbekistan).

Total territory of Karauzyak district is 5.9 thousand km^2, of which agricultural arable land covers ca. 32.2 thousand ha, arable land – ca. 18 thousand ha, pastures – 380.1 thousand ha, and plots of local population ('*tamorka*') cover 2.2 ha.

According to official statistics rural household possess the main amount of livestock animals, including cattle, cows, sheep, horses, poultry and goats. With regards to agricultural plant production official statistics reports production of wheat, potato, vegetables, melons and fruits in Karauzyak district. Again rural households were the main contributors to most of the crops in 2014, except wheat, which was to a large extent produced by private farms.

With regards to social development indicators, has 1 Social Support Fund, 1 hospital, medical points at each VCC, number of schools in each VCC and kindergartens in some VCCs, 3 colleges in the district.

Karabuga VCC is considered a well-to-do village with rather wealthy households. The village is favorably located in the upstream of an irrigation channel. Moreover, villagers have pumps and can easily cope with water shortages during agricultural season. There is enough land, even more than villagers can handle. There is a possibility to add some land to agricultural production upon sufficient labor for agricultural production. Algabas has worse socio-economic and climatic conditions and is considered as economically deprived VCC in Karauzyak district of Karakalpakstan.

Almost all rural areas are served by the national grid and hence can access mains electricity. In practice, cuts are common, with electricity supply particularly erratic in rural areas. Some rural areas are connected to piped water and to sewerage systems. In practice, however, water supply is either unreliable or of low quality. Gas supply is unstable from low depending on the season to no supply in remote villages. This is not only a major barrier to enterprise development (since few enterprises could afford to invest in, or operate on the basis of, diesel-generated electricity alone),

it also affects farming since irrigation pumps are mostly electric and reliability suffers if there are frequent power cuts. 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 coal to minimize this issue as much as possible.

Both surveyed villages apply certain livelihood strategies prominent in rural areas of Uzbekistan and Karakalpakstan, including: (1) subsistence agriculture, (2) seasonal labor migration, (3) official jobs at state-funded or budget organizations, (4) some entrepreneurial (non-agricultural) activities. 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.

Survey showed that the majority of the households in rural Karakalpakstan are usually led by males, and very rare by females (for example divorced families). For the head of a household it is important to possess rich experience in agriculture, since he or she determines the livelihood strategy of the household and agriculture is the main source of income for most of the rural households in Karakalpakstan.

In the surveyed households there are on average 5-6 family members (2-3 children). Average number of males and females in surveyed households is almost equal. In all surveyed households, eligible members (as per age) have at least a college degree (secondary education). In one third of the households there is at least one male with a bachelor's or higher degree and a female with the same degree.

The rural households in Karakalpakstan are net buyers of food products. 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. There were specified six sources of income for surveyed households, including: (1) income from own land and livestock rearing, (2) wages in agricultural sector, (3) salaries and pensions paid by the government, (4) wages in private sector, (5) own non-agricultural business (small scale entrepreneurship) and (6) income from family member working abroad.

There is no independent public organization/public fund operating in Karauzyak. Except for those that are established and monitored by the government at all levels, such as Farmers Council for example, Village Citizens Council. Only 10% of respondents acknowledged their participation in public organizations, by which they meant Village Citizens Council

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. Most of the land owned by respondents is cultivated via surface irrigation.

With regards to physical assets, only few households own a tractor and they carry out farming activities. Even fewer households have water pumps. Cars are deemed as a mean of luxury and owned by of households. Nearly all households own a TV, but just about a quarter of them have satellite antenna. Mobile phones are omnipresent nowadays, though three households don't have one. Refrigerator is present at little more than half of households, though washing machine is available only in one household.

With regards to livestock production the most widespread kind of livestock among respondents in Karauzyak district of Karakalpakstan is milk cows, since milk is a significant part of the daily nutrition of rural people. Non-milk cows are the second most popular animals and present at about half of households. Among small ruminants the most widespread are goats, especially she-goats.

Sheep and rams are bred by few households and horses and mules are present at even fewer households. Because of subsistence type of agricultural production of the surveyed households, many of the surveyed households possess poultry. It is undeniable that men are key decision-makers regarding livestock production.

Crops are vital for households in rural areas of Karakalpakstan to survive in rural areas. Since most of the households own small plots of land they usually cultivate food crops such as vegetables, watermelons, fruits and beans. Households that have livestock cultivate fodder crops to feed animals.

There are three possible reasons for cultivation of certain crops, including: (1) for own consumption; (2) for sale; (3) for feeding animals. Majority of the surveyed households cultivate food crops (vegetables, beans, fruits, etc.) for own consumption, cultivate fodder crops to feed their livestock, and limited amount of fruits and vegetables for sale.

Not many households practice new farming technologies. Crop rotation is the most popular agricultural method, which is used for all crops. Minimal tillage is the second most applied technique by surveyed households, especially regarding vegetables. Households also practiced planting trees around fields for beans, vegetables, watermelons, and fodder crops.

Livestock owners in Karakalpakstan mostly practice grazing in pastures, since it is free and available during most of the year. In addition, they use stall-feeding. It happens that in the off-season (winter and early spring) households experience fodder shortage, and have to buy the required amount and type of fodder at local markets. The main fodder market is located in Karauzyak district center and is in operation on Wednesdays. It brings together sellers of various fodder types from hay to grain and husk. Prices vary depending on the season.

Production of own fodder is problematic despite of vast agricultural lands due to unreliable irrigation water supply. There is usually an irrigation channel in villages, but numerous pumps (electric or diesel) are required to convey the water to the fields. Thus in the times of electricity cuts or high prices for diesel, irrigation of fields becomes expensive or just not possible.

State veterinary service exists in Karauzyak and its branch office is located in the centre of the district. Respondents shared generally positive views on the quality and affordability of the veterinary services provided. However, they have no other choice and have to deal with whatever service the state veterinary office provides them. Still, some local residents in surveyed villages pointed out that they had to go to the centre of Karauzyak and spend time and money to get veterinary service. On the contrary, other respondents said that they could phone call and summon veterinary service specialist to the village, though it remains unclear who covers round-trip transportation costs.

There is one market in Karauzyk district, open every Wednesday and located in the district center. The market has separate divisions for food products market, clothing market and livestock market. Rural households visit local livestock market basically for selling their livestock in anticipation of big family events (such as weddings, festivities, etc.) as to get cash, or to buy some missing food products or fodder for animals.

Enhancing food security is one of the key challenges that impacts livelihood strategy of rural households. Households applied different strategies to mitigate or resolve issues with food products availability during last 30 days. The most applied strategy is to get food for debt from local shops or get help from relatives, friends or community members. Another way of dealing with this issue was to spend savings for food or decreasing healthcare costs. In the most of surveyed households (78%), family members decide together on how to deal with food security issues.

There are only two branches of commercial banks located in the centre of Karauzyak district: Agro Bank and Halk Bank (People's Bank). None of formal credit organizations are present at any of

the villages in Karauzyak district. Interviewed respondents didn't indicate any primary informal credit source they could get large amount of funds from, based on interest rate. Nevertheless, local people in both villages borrow from each other small amounts of money, but not on a regular basis. However, there exist couple of retail shops in both villages where people get food or other products on "credit", which means that they repay the costs later at the end of that month when they have cash or funds on their plastic (debit) cards. In general, a district bank is the primary official source where local people seek money to borrow. Prevailing majority of households experience acute shortage of money for agricultural production. Their size and informality also means that *dehqon* farms are unattractive to the banking sector and indeed are excluded from the preferential loans extended to private farms. As a result, they have to pay much higher interest rates for loans, with maturities only suitable for seasonal credit.

Agricultural production systems are vulnerable to numerous factors: natural, financial, institutional, and others. Draught is one most severe factors that significantly affect agricultural production in conditions of irrigated system. Households try to cope with this factor via using additional irrigation, leaving land under fallow, using draught-resistant crops. Another most widespread negative factor is crop damage by pests. Most households do nothing about it, very few households try to apply improved crop cultivation, make changes in the crops structure, use pest protection means. Livestock diseases took place frequently nearly in half of households. Most of the households used veterinary services and few households changed their livestock structure by replacing weak animals with more diseases-resistant ones.

Outside wheat and cotton production, there is no extension service in Uzbekistan. This was previously provided as one of the functions of the state and collective farms but was lost with their break up.

According to the local government, Karauzyak district faces some problems including: availability and access to water, irrigation water; underdeveloped industry; lack of working places; population is passive in terms of seeking addition income sources, improving livelihood. In the view of local administration efforts of both national and international organizations should be geared towards solving these issues.

In contrast, opportunities for growth in *dehqan* farms appear to be limited by very small farm sizes. Leasehold of land in *dehqon* farms means that increasing farm size through land purchase is impossible and, indeed, even informal land rental for *dehqon* farms is said to be rare. Further, their use for subsistence and thus as safety nets encourages risk avoidance strategies through diverse cropping patterns. And while this means that household needs are usually covered, it also means that marketed surpluses are small and, as a result, cash earnings are limited (UNDP, 2010).

Estimates suggest significant differences in income and food consumption between urban and rural areas, with lower levels in rural areas, and hence there is an obvious case for concentrating policy on this imbalance. It is apparent that actions aimed at rural economic growth will have agriculture at their core, but emphasis on the wider rural economic development will also be important since, worldwide, experience shows that agricultural growth alone is insufficient to raise rural income substantially. This is because agricultural earnings accrue mainly to those with access to the key factors of production (land and water) and because the linkages between agricultural growth and incomes in the rural sector as a whole are weak. As a result, addressing non-agricultural incomes and, hence, non-agricultural income sources is essential in rural growth (UNDP, 2010).

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Annexes

Annex 1. Questionnaire for BLS (translated to English from Russian)

ICARDA Research Program "Dryland Systems"

Baseline study

QUESTIONNAIRE

Target region: Central Asia

Project site: Karakalpakstan Republic, Karauzyak district

Part A: GENERAL INFORMATION

A.1. Questionnaire number _____

A.2. Country _____

A.3. Province: _____

A.4. District: _____

A.5. Village: _____

A.6. GPS data (WGS84):

A. 6.1. Latitude _____

A.6.2. Longitude _____

A.7. Name of the head of a household _____

A.8. Date of visit _____

PART B: INFORMATION ABOUT RESPONDENT AND THE HEAD OF A HOUSEHOLD

B.1 Is respondent the head of a household (HH) (1=Yes; 0=No) ____

If no, then

B.1.1. Does head of HH go out of residence area for income? (1=YES; 0=NO) ____

B.1.2. Sex of HH (1=MALE; 2=FEMALE) ____

B.1.3 Age of the head of HH (years) ____

B.1.4. Experience of the head in Agriculture (years): ____

B.2. Sex of the respondent (1=MALE; 2=FEMALE) ____

B.3. Age of the respondent (years) ____

B.4. Experience of the respondent in Agriculture (years): ____

B.5. Who makes decisions on the following matters:

Field	Decision making	Only Men: (1=YES; 0=NO)	Only Women: (1=YES; 0=NO)	Together: (1=YES; 0=NO)
Household level	Consumption			
	Expenses			
Cultivation of crops (all kinds)	Costs			
	Inputs			
Livestock (all kinds)	Costs			
	Inputs			

PART C: HOUSEHOLD DEMOGRAPHIC CHARACTERISTICS

C.1. Household structure

	Total	≤ 7 years	8-14 years	15-24 years	25 – 65 years	> 65 years
Male						
Female						

C.2 How many family members have non-agriculture income: male_____ female _____

C.3 How many members are able to or:

C. 3.1. Males:

C.3.1.1. Read and write _____

C.3.1.2. Graduated from or study at high School _____

C.3.1.3. Graduated from or study at College _____

C.3.1.4. Have University degree (bachelor, master) _____

C.3.1.5. Have PhD or professor's degree, etc. _____

C. 3.2. Females:

C.3.2.1. Read and write _____

C.3.2.2. Graduated from or study at high School _____

C.3.2.3. Graduated from or study at College _____

C.3.2.4. Have University degree (bachelor, master) _____

C.3.2.5. Have PhD or professor's degree, etc. _____

C.4. Family labor contribution to household business

C.4.1. How many male-members work at household _____

C.4.2. How many female-members work at household _____

PART D: FINANCIAL, PHYSICAL, NATURAL, AND SOCIAL CAPITAL

D.1. Sources of family/household income:

D.1.1. Own land and livestock (plot of land or farm) (%) _____

D.1.2. Wage in agriculture sector (%) _____

D.1.3. State salary, pension (%) _____

D.1.4. Wage in private sector (%) _____

D.1.5. Own non-agriculture business (%) _____

D.1.6. Income from abroad migration (%) _____

D.2. How many rooms in a house: _____

Including:

D.2.1. Living: _____ D.2.2. With heating: _____

D.2.3. With electricity: _____ D.2.4. Toilet: _____

D.2.5. Bathroom _____

D.3. Is there a water supply system in a house? (1=YES; 0=NO) _____

D.4. Living space (squared meters) _____

D.5. Non-living space (squared meters) _____

D.6. Garden/plot near a house (squared meters) _____

D.7. Area of the household (squared meters) _____

D.8. Approximate value of the house (local currency) _____

D.9. Is head of a household a community leader? (1=YES; 0=NO) _____

D.10. Does any member of a household participate in any public organization? (1=YES; 0=NO)

_____

If no, proceed to question 12

D.11.1. How many male-members are members of any public organization ____

D.11.2. How many female-members are members of any public organization ____

D.12. Can you rely upon state subsidy in case of the loss of harvest? (food, aid, etc.) (1=YES; 0=NO)

_____

If yes,

D.12.1. At which percentage loss level: 25%, 50%, 75%, 100%?

_____

D.13. Are there any extension services in your community? (1=YES; 0=NO) _____
(*If no, proceed to question 16*)

D.14. Extension services

Organizations	How many times did you meet with agricultural consultant (extension services) for the last 12 months?	How many farm field days did you visit for the last 12 months	Which institutions provide information on agricultural innovations?	Please, assess the quality of extension services 5=very useful 4=useful 3=satisfactory 2=not that much useful 1=useless 0= have no idea / didn't get the services
State consultancy service				
State research institutions				
Farmers cooperative or groups				
Nearby farm households				
Traders, agrodealers				
Non-state research institutions				
Mass-media				
Private and international organizations				
Other (name)				

D.15. Visit of the extension services specialist/agent for the last 12 months

Questions	**Male**	**Female**
How many times the head of the HH visited the specialist/agent of extension service?		
How many times the specialist/agent visited your household?		
Were there any demo experiments (farm days) in your farm land (1=YES, 0=NO)		
Did you participate in any farm day on crop cultivation? (1=YES, 0=NO)		
Did you participate in any farm day on livestock? (1=YES, 0=NO)		
Did you participate in any training/seminar on agriculture for the last 12 months (1=YES, 0=NO)		
Did any member of a HH participate in any farm day on crop cultivation? (1=YES, 0=NO)		
Did any member of a HH participate in any farm day on livestock? (1=YES, 0=NO)		
Did any member of the HH participate in any training/seminar on agriculture for the last 12 months (1=YES, 0=NO)		
Which issues did you discuss with the extension services specialist/agent 1 crop cultivation; 2 livestock; 3 natural resources; 4 social issues; 5 pests; 6 other.		

D.16. Main topics you would like to discuss with extension services specialist/agent:

D.16.1. Male: _____

D.16.2. Female:_____

D.16.3. Youth (up to 35 years): _____

D.17. Do women, incl. single, have access to extension specialist/agent services on agriculture _____?
(1=YES; 0=NO)
D.17.1. If no, why?

_____

_____

D.18. Can women, incl. single, freely participate in trainings on agriculture outside of community?
(1=YES; 0=NO)
D.18.1. If no, why?

_____

D.19. Access to land (as of January 1, 2015)

Land type	Dry farming land (ha)	Irrigated (ha)		Fallow (ha)	Total (ha)	Total value of own lands (thds UZS)
		Surface irrigation	Drip/overhead irrigation			
Own lands						
Owned by males						
Owned by females						
Owned by youth						
Land lease						
Distributed land						
Public land (pasture)						
Land with afforestation						

D.20. Does woman possess the legal rights for the land, which she owns (wife, mother, daughter)?
(1=YES; 0=NO) _____
D.20.1. if no, why?

_____

D.21. Assets of the household

Name	Amount	Condition (1=Good, 2=Satisfactory, 3=Bad)	Own (1=Male, 2=Female, 3=Together)
Tractor			
Grain harvester combine			
Water pump			
Car			
Small truck			
Big truck			
Grain storage facility			
TV			
Satellite antenna			
Radio, audio player			
Mobile phone			
Stationary phone			
Refrigerator			
Washing machine			
Sideboard			

Carpets			

D.22. How many livestock (cattle and small ruminants) does your household possess? How many of livestock belongs to you or other members of a household?

Total amount of livestock _____

Including:

D.22.1. Owned by head of a household _____

D.22.2. Owned by a respondent _____

D.22.3. Owned by a husband/wife of a respondent _____

D.22.4. Owned by other household members _____

D.22.5. Leased to you by the head of a household _____

D.23. How many livestock of following kinds do you possess?

Livestock	Number	Owned by 1= male, 2=female, 3=together	Breed: 0=local; 1=improved; 2=crossed	Milk production (litre/year)	Wool production (kg/year)	Number of cattle sold	Average price for one unit of	Average weight of one unit of	Average price for one litre of milk	Average price for one kg of wool
Cattle										
Milk cows										
Non-milk cows										
Bull										
Buffalo										
Camel										
Sheep										
Mature sheep										
Rams										
Lambs										
Goats										
Mature she-goat										
He-goat										
Young goats (yearlings)										
Birds										
Turkey										
Chicken										
Duck										
Other birds										
Horses, mules										
Bees										
Other (name) _____ ___										

PART E. AGRICULTURAL PRODUCTION

E.1. Do you have a plot of land (garden) near house? (1=YES; 0=NO) _____

If yes:
E.1.1. How many plots of land does your household own? _____

E.1.2. Area of all plots of land (m2): _____

E.1.3. Dry-farming or irrigation? (1=dry-farming; 2=clean water irrigation; 3=sewage irrigation)

_____

E.2. Cultivation of crops

	Cotton	Wheat	Rice	Beans	Vegetables	Watermelons	Fodder crops	Fruit trees
Do you cultivate these crops (1=YES; 0=NO)								
What is the crop area (sq. m)								
Crop priority (1-8, 1 = very important)								
Purpose of cultivation 1=own consumption, 2= for sale, 3=for livestock, 4= other (name)								
How much is consumed for family needs: share (%) from total production								
Average yield of Grains **(kg)**								
In a normal year								
In a bad year								
The best yield for the last 10 years								
Average yield of Straw **(kg)**								
In a normal year								
In a bad year								
The best yield for the last 10 years								

E.3. Who makes decision on how to use the income from plot land? (1=Male; 2=Female; 3=Together)

_____

E.4. Who works at plot land?

Men ____%; Women____%; Youth____%; Children____ %

E.5. Do you know any kinds of agricultural methods/practices that harm health of women or children? (1=YES; 0=NO _____

E.6. Farm methods of agricultural production used in 2014

Name	Cotton	Wheat	Rice	Beans	Vegetables	Water-melons	Fodder crops	Fruit trees
Crop rotation, or other that was applied at least 4 years								
Soil fertility (Code A)								
Soil-preserving, water-saving methods (Code B)								
Type of stresses occurred (Code C)								
Price for the primary crop (UZS/kg)								
Name of the secondary crop product (Code D)								
Amount of the produced secondary crop product (kg)								
Price for the secondary crop product (UZS/kg)								

Code A: Soil fertility

1=good	2=average	3=low

Code B: Resource-saving methods

0=none	5=zero tillage	10=prevent grazing after harvesting
1=terrace	6=minimal tillage	11=crop rotation
2=crop stubble	7=contoured cylinders (barriers)	12=other (name)_____
3=patching	8=stone cylinders (barriers)	
4=tree planting around the field	9=raised bed and furrow planting	

Code C: Type of annual stress

0=none	1=pests	2=draught	3=extreme heat	4=diseases

Code D: Name of the secondary crop product

1=straw	2=crop resides	3=other _____

E.7. Pesticides application method (1=mechanized; 2=manual; 3=mixed) _____

E. 8. Who applies fertilizers in case of machinery use? _____

1=male; 2=female; 3=other (name) _____

E.9. Who applies fertilizers in case of manual application? _____
1=male; 2=female; 3=other (name) _____

E.10. Are accident prevention measures complied with during fertilizers application? (1=YES; 0=NO)

_____

E.11. Are you aware of harmful consequences for Woman health during fertilizer application?? (1=YES; 0=NO)

E.12. Who is responsible for land irrigation?? (1=male; 2=female)

_____

E.13. Can Women be responsible for land irrigation?? (1=YES; 0=NO)

_____

If no, why? _____

E.14. In which activities are women engaged in irrigation (responsibility)? ____

1=large farm entity	2=small farm entity	3=land plot
4=water distribution from river/channels of secondary level	5= water distribution from river/channels of third level	6=collection of fees for water supply services
7=measurement of water flow/stream		

E.15. In which activities are men engaged in irrigation (responsibility) ? ____

1=large farm entity	2=small farm entity	3=land plot
4=water distribution from river/channels of secondary level	5= water distribution from river/channels of third level	6=collection of fees for water supply services
7=measurement of water flow/stream		

E.16. Local and improved crop varieties, cultivated by farm households.

	Wheat	Rice	Mung-bean	Beans	Maize	Potato	Fodder	Vege-tables	Fruit trees	Other crops
Are you aware of new improved varieties? (1=YES; 0=NO)										
Did you cultivate them? (1=YES; 0=NO)										
If no, why? (Code A)										
If yes, which varieties? (Name of varieties)										
For how long did you cultivate these varieties? (years)										

Do you still cultivate these varieties? (1=YES; 0=NO)										
If no, why? (Code A)										

Code A: reason you stopped cultivating particular crop variety:

1=low yields	2=absence of seeds	3=diseases
4=pests	5=low quality of products	6= other (name)_____

E.17. How many farmers you know, who cultivate improved crop varieties in your village? _____

E.18. Do you apply zero tillage in your land? (1=YES; 0=NO) _____

E.19. What kinds of tillage are applied in your community/village? Name, please

_____

E.20. How many farmers you know who apply zero tillage in your village? _____

E.21. Local varieties: which local varieties do/did you cultivate?

	Wheat	Rice	Beans	Maize	Fruit trees
Local name					
Other name					
Crop area last season					
Since when has been cultivated?					
Why do you grow this variety?					
When did you stop cultivating this variety?					
Reasons (Code A)					

Code A: reason you stopped cultivating particular crop variety:

1=low yields	2=absence of seeds	3=diseases
4=pests	5=low quality of products	6= other (name)_____

PART F: ACCESS, QUALITY, AMOUNT AND MANAGEMENT OF WATER RESOURCES

F.1. Water resources management

Name	Source of irrigation			
	River	Channel	Well	Other_____
Private assets				
Public assets				
Duration of irrigation (hour/watering)				
Total amount of water (1=good 2=medium 3=bad)				
Costs for appliances (installations) UZS				
Installations on liquid fuel engine (1=YES; 0=NO)				
Installations on electric engine (1=YES; 0=NO)				
The actual area of irrigation with the help of installations (ha)				
Potential area of irrigation where installations can be used (ha)				
Fuel costs for irrigation (UZS/ha)				
Electricity costs for irrigation (UZS/ha)				
Other irrigation costs (overhead or drip irrigation) (UZS/ha)				

PART G: LIVESTOCK PRODUCTION AND MANAGEMENT

G.1 Monthly contribution (%) of each forage type into livestock production of your household

Name	**Unit (1=ton; 2=ha; 3=other)**	**Total amount used in 2014**	**Purchased amount**	**Price for one unit**	**Share (%) of each forage type**											
					September	**October**	**November**	**December**	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**
Public pasture																
Private pasture																
State pasture																
Barley																
Barley mowing																
Straw																
Barley grains																
Green biomass*																
Straw *																
Cereal brans																
Melassa																
Min-Vit mixture																
Byproducts																
Other																
Amount of water used (litres) **																

* Name type of forage

** Water for drinking, cleaning of animals, etc.

G.2. Where do you get water for your livestock? _____

1=river 2=channel 3=well 4=artesian well 5=drainage well 6=pond

G.3. How clean is water for drinking? (1=drinking; 2=salty; 3=unknown) _____

G.4. How many times per day do you give water for your livestock? _____

G.5. Last year, at what age did you separate lambs, calves, goatlings from their mother? (years)

_____

G.6. Last year, what share of separated lambs/calves/goatlings was used for:

A. Replacement of old animals: _____ B. Sale: _____ C. Other: _____

LIVESTOCK PRACTISES

Livestock breeding

G.7.Which method of cattle breeding do you apply? _____
(1=natural; 2=artificial insemination (AI); 3=both)

G.7.1. IF AI, who provides services on AI? (1=private company; 2=state company)_____

G.8. How many animals were artificially inseminated since last year? _____

G.9How many animals were born since last year? _____

G.10. How many male animals (bull/ram/goat) do you replace with younger ones each year??

_____

G.11. When do you replace male animals? _____

G.12. Where do you get new animals (1=own; 2=buy; 3=both) _____

Milk processing

G.13. Do you process the milk at household? (1=YES; 0=NO) _____

G.13.1. If yes, which animals milk?_____

G.13.2. If yes, what milk products do you produce in your household? _____

G.14. Do you sell the surplus of milk products? (1=YES; 0=NO) _____

G.15. Who is responsible for livestock care (1=men; 2=women; 3=children)?_____

Cattle: _____ Small cattle: _____ Poultry: _____

Animals health

G.16. Do you keep new animals in quarantine before let them into the herd? (1=YES; 0=NO)

_____

G.16.1. If yes, for how long? _____

G.17. Are you aware of diseases transmitted from animals to humans (1=YES; 0=NO)

_____

G.18. How many times a year a veterinary specialist visited your household?

_____

G.19. Do you protect your livestock from parasites??

Name of parasites / diseases	Date of last protection of livestock

PART H: AGRICULTURAL MARKETS AND FOOD SAFETY

Access to livestock market

H.1. How far is the closest livestock market from your household (km) _____

H.2. Purpose of your visit to livestock market? _____
(1=sell; 2=buy; 3=exchange animals; 4=other _____)

H.3. Round-trip transportation costs to deliver animals to the market? (All costs, incl. fuel cost for own car, etc., UZS) _____

H.4. How many animals did you sell/buy last year? _____

H.5. Who is responsible for the sale and purchase of animals in the market? _____
(1=male, 2= female, 3=together)

H.6. How far is the closest food market from your household (km)? _____

H.7. Purpose of your visit to food market? _____
(1=sell, 2=buy, 3= other_____)

H.8. Round-trip transportation costs to deliver food products to the market? (All costs, incl. fuel cost for own car, etc., UZS) _____

H.9. Who is responsible for the sale and purchase of agricultural products in the market?
(1=male, 2=female, 3=together) _____

H. 10. Access to food

Please, answer following questions: (please consider situations for the past 30 days)

Questions	**Answer (1=YES; 0=NO)**	**How frequently this happens**		
		1=Rarely (1-2 times for the last 30 days)	*2=Sometimes (3-10 times for the last 30 days)*	*3=Frequently (more than 10 times for the last 30 days)*
Are you worried that your family won't have enough food within the month?				
Do members of your household limit the consumption of the food due to lack of the food?				

H.11. Which survival strategies did your household applied due to weak food safety (last 30 days)?

Strategies	**(1=YES; 0=NO)**
Food for debt, help of relatives, friends, community	
Grown-ups eat less for children to eat more	
Purchased seed stock was stored for the next season	
Children were sent out to live with relatives	
Barter to buy more food	
Use of savings to buy more food	
Decrease expenses on healthcare, education to buy food	
Sale of poultry to buy food	

Sale of house assets (appliances, dish, etc.) to buy food	
Sale of small cattle to buy food	
Sale of cattle to buy food	
Sale of agricultural tools, seeds to buy food	
Quit smoking to save money for food	
Accept food aid from international organizations	
Other (name): _____	

H.11.1. Who decides on the household survival strategy choice? (1=male, 2=female, 3=together) _____

H.12. Indicate three primary sources of food in your household for the last 30 days?

Source 1: _____ Source 2: _____ Source 3: _____

1=Own production	4=Wages, pension	7=Community aid
2=Livestock sale	5=Income from private work (agro and non-agro)	8=Help from relatives, friends
3=Trade/small business	6=Money remittances	

H.13. Does any member of your household receive benefits from the social security fund?? (1=YES; 0=NO) _____

How many women? _____ How many men? _____

H.14. How frequently do you consume following food products (last 30 days)?

Nutrition diversity	**Times per week**			
Food product groups	**Daily**	**3-5 times**	**1-2 times**	**Never**
Wheat, rice, maize, sorghum				
Pumpkin, cabbage, eggplant, etc.				
Potato and other roots				
Spinach and other greens				
Other vegetables: tomatoes, cucumbers, etc.				
Legumes: beans, peas, nuts, etc.				
Local fruits: pomegranates, grapes, peaches, plums, pears				
Imported fruits: orange, pineapple, banana, etc.				
Meat: beef, goats, sheep, poultry				
Poultry products – chicken eggs, duck eggs, other eggs				
Sea food: fresh fish, shrimps, crabs, etc.				
Milk products: milk, sour cream, etc.				
Oil, vegetable oil, cheese, butter, etc.				
Sugar and honey				
Chocolate and candies				
Pastry				
Juice, soda drinks				
Tea, coffee				

H.15. In which season do you sharply feel the lack of food? _____

1=Winter	2=Spring	3=Summer	4=Autumn

H.16 Are there sufficient funds to buy quality food? (1=YES; 0=NO) _____

H.17. Do women have an access to full nutrition? _____
(1=YES; 0=NO; 3=Sometimes (please describe cases)

H.18.1. If no, why?____

PART I: AGRICULTURAL STRATEGIES

I.1 Level of your satisfaction with your contribution to social decision-making (1=satisfied; 2=partly satisfied; 3=not satisfied) _____

I.1.1. Why? _____

I.2. Level of your satisfaction with the execution of the decisions (1=satisfied; 2=partly satisfied; 3=not satisfied)_____ _____

I.2. 1. Why? _____

I.3. Do women participate in family decision-making process? _____

(1=YES; 0=NO; 3=Sometimes (describe cases) _____

I.3. 1. If no, why? _____

I.4 Do women participate in community decision-making process??

(1=YES; 0=NO; 3=Sometimes (describe cases) _____

I.4.1. If no, why? _____

PART J: LOANS, ACCESS TO FINANCING

J.1. Who in a household decides on the loan, (amount, source)? ((1=Male, 2=Female,; 3=TOGETHER)
_____

J.2. Do you have reliable sources of borrowing in case of need? (1=YES; 0=NO) _____

J.3. What is the maximum amount you can borrow from reliable source? (UZS)_____

J.4. Do you have an access to other sources of financing? (1=YES; 0=NO) _____

J.4.1. If yes, then which one do you usually choose and why? _____

J.5. Do you experience sharp lack of money for agricultural production? (1=YES; 0=NO) _____

J.6. In which months do you usually experience the lack of money?_____

1=January-March	2=April-June	3=July-September	4=October-December

J.7. Have you received money/loans from any of the sources for agricultural and livestock production? (Last 12 months)? (1=YES; 0=NO) _____

J.7. 1. Have any member of a household received money/loans from any of the sources for agricultural and livestock production? (last 12 months)? (1=YES; 0=NO)_____

J.8. Have you ever received a loan (formal and informal?

	Source (CODE A)	**How many times?**	**In due time?** (1=YES; 0=NO)	**Were you able to repay on due time? (1=yes; 0=no; 3=n/a)**	**Do you plan on borrowing? (1=YES; 0=NO)**	**Who borrowed? (1=Men 2=Women 3=Youth)**
Cash						
Food						
Seeds						
Fertilizers						
Pesticides						
Loan for agricultural machinery						
Loan for agricultural activity						
Loan for irrigation						
Loan for non-agricultural activity						
Loan for repayment of other debt						
Loan for other services education, etc.)						

CODE A: Source

1=Bank	2=Local creditors	3=Nearby farms	4=NGO	5=State	6=Relatives	7=Other

PART K: VULNERABILITY OF AGRICULTURAL PRODUCTION SYSTEM AND LOCAL MECHANISMS OF HOUSEHOLD DECISION-MAKING

K.1 Main problems

For the last 10 years have you observed the following issues	**Were?** (1=YES; 0=NO)	**How frequently?** (How many times in 10 years)	**What did you do to solve/mitigate this problem? (Adaptation strategies)** (Code A)
Draught			
Hail			
Flood			
Livestock diseases			
Out-of season raining			
High temperature fluctuations			
Low temperature fluctuations			
Pests damage crops			
Family member disease due to extreme weather conditions			
Changes in the soil salinity level and increase/decrease of soil humidity			
Main changes in the structure of crops			
Main changes in the livestock			
Main changes in the agricultural investments (capital)			
Crop yield decline			
Groundwater depletion			
Loss of income			
Food instability, insecurity			
Livestock death			
Decline in consumption			
Worsening of the health			
Significant changes in agricultural taxation			
Significant changes in agricultural reforms			

Code A: Adaptation strategies

1=Did nothing	2= Left land under fallow	3= Sold part of the land	4= Leased/rented part of the land
5=Sold livestock	6=Additional irrigation	7=Invested in ponds	8=Changes in crop cultivation
9= Applied improved crop cultivation methods	10= Collected additional information	11= Other adaptation measures	12= Changed planting schedule
13= Used drought-resisting crop	14= Changed livestock structure	15= Borrowed money from relatives/others	16= Relied upon state/non-commercial aid
17= Bought less food and changed nutrition	18= Switched to non-agriculture job	19=Migration	20=Other____

K.2 Have you insured your crops this year?? (1=YES; 0=NO) _____

K.2.1. If no, then name reasons, please (if **yes**, go to question K.3)_____

1= I don't trust insurance companies	2= I didn't receive my premium last time	3= Never heard of the insurance program
4= No money for insurance	5= Religious reasons	6=Other

K.2.2. Who provided insurance?_____

1=State	2=Private company	3=Other (name)_____

K.3. How much costs insurance of the 1 ha of land this year (UZS)? _____

K.4. Have you received any payment on insurance within the last 5 years? (1=YES; 0=NO)_____

K.4.1. If yes, how many times? _____

K.5. What was the wheat yield in the last 5 years (kg/ha)

2010 (kg/ha) _____

2011 (kg/ha) _____

2012 (kg/ha) _____

2013 (kg/ha) _____

2014 (kg/ha) _____

K.6. Who makes decision on insurance in the household? _____
(1=Male, 2=Female, 3=Together)

K.7. Can Woman independently get insurance for crop yield? (1=YES; 0=NO)_____

K.7.1. If no, why?_____

K.8. Is there accessible information on crop insurance? (1=YES; 0=NO) _____

Annex 2. Letter of support to UNDP office in Nukus

ICARDA Международный центр сельскохозяйственных исследований в засушливых регионах
ПРОГРАММА КГМСХИ ДЛЯ ЦЕНТРАЛЬНОЙ АЗИИ И ЮЖНОГО КАВКАЗА
САС ЦАК

Исх. № 3187
от 8 июля 2015 года

Главе офиса ПРООН в г.Нукус
г-ну Палуаниязову Б.

Уважаемый Бахадур Палуаниязов,

Региональное представительство ИКАРДА по Центральной Азии и Южному Кавказу свидетельствует Вам свое высокое уважение и информирует о том что, ИКАРДА реализует Исследовательский проект «Интегрированные сельскохозяйственные исследования в Засушливых системах».

Хотелось бы отметить, что одним из исследовательских участков был отобран сельский сход граждан Карабуга, Караузякского района. В рамках данного исследовательского проекта предполагается проведение базового исследования, результаты которого позволят определить проблемы и пути повышения сельскохозяйственного производства.

Региональное представительство ИКАРДА пользуется случаем, чтобы возобновить Вам лично и офису ПРООН в г. Нукус уверения в своем уважении, благодарит Вас за сотрудничество и поддержку, а также любезно просит оказать содействие в осуществлении базового исследования консультанту ИКАРДА г-же Инне Руденко.

С уважением,

Джозеф Турок
Региональный Координатор ИКАРДА
Глава отдела по реализации Программы КГМСХИ
для Центральной Азии и Южного Кавказа

Региональный Офис по Центральной Азии и Южному Кавказу. А/Я 4375, Ташкент, 100000, Узбекистан
Тел.: (+998-71) 237-21-04/30/69; Факс (+998-71) 120-71-25. Email: icarda-tashken:@cgiar.org

Annex 3. Letter of support to the Khokim of Karauzyak district

ICARDA Международный центр сельскохозяйственных исследований в засушливых регионах
ПРОГРАММА КГМСХИ ДЛЯ ЦЕНТРАЛЬНОЙ АЗИИ И ЮЖНОГО КАВКАЗА
САС ЦАК

Исх. № 3483
07 JUL 2015

Хокиму Караузякского района
Республики Каракалпакстан
г-ну Утемуратову Д.М.

Уважаемый Давлетбай Минаджович,

Региональное представительство ИКАРДА по Центральной Азии и Южному Кавказу свидетельствует Вам свое высокое уважение и благодарит Вас и администрацию хокимията за организацию и проведение встречи с представителями фермерских организаций (16 апреля 2014 года в здании хокимията Караузякского района). Данная встреча была посвящена обсуждению целей и задач Исследовательского проекта «Интегрированные сельскохозяйственные исследования в Засушливых системах», которую реализует ИКАРДА.

Хотелось бы особенно отметить, что одним из исследовательских участков был отобран сельский сход граждан Карабуга, Караузякского района. В рамках данного исследовательского проекта планируется проведение базового исследования, результаты которого позволят определить проблемы и пути повышения сельскохозяйственного производства.

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С уважением,

Джозеф Турок
Региональный Координатор ИКАРДА
Глава отдела по реализации Программы КГМСХИ
для Центральной Азии и Южного Кавказа

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