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## **PROBLEMS OF LIVESTOCK PRODUCTION AT THE LOWER REACHES OF THE AMU DARYA RIVER IN UZBEKISTAN**

### *PROBLEMY W ZAKRESIE PRODUKCJI ZWIERZĘCEJ W DOLNYM BIEGU RZEKI AMU DARYA W UZBEKISTANIE*

**Key words: household farm, livestock production, Uzbekistan, Khorezm region**

*Słowa kluczowe: gospodarstwo rolne, produkcja zwierzęca, Uzbekistan, region Khorezm*

**Abstract.** Livestock rearing plays a pivotal role in providing population with food commodities and contributes 46.3% of the gross agricultural output of Uzbekistan. Aftermath of independence many state enterprises, which were main livestock commodity producers were closed down. As consequence, now the livestock population take place in household plots and newly formed small sized private farms. Considering the rareness of research on livestock rearing in Uzbekistan in the last two decades this paper aims at finding out problems faced by livestock producers during the transition period and analyzes possible solutions for further improvement based on survey results of 56 livestock farms and 80 household farms from the region Khorezm. Improvement of input and output market infrastructure and appropriate institutional changes in land and water use rights would allow further development of the livestock sector in conditions of market economy.

### **Introduction**

Since the independence of Uzbekistan the Government started gradual transformation towards the market economy and introduced wide-ranging reforms in the economical sectors, including agriculture. Agricultural reforms at first stage comprised farm privatization and trade liberalization, later focusing on the development of agricultural support services and processing capacities [Rudenko 2008]. The liquidation of state agricultural enterprises resulted in expansion of livestock population mainly in small household plots. Wheat self-sufficiency policy in Uzbekistan occurred mainly at the expense of reducing fodder crop areas which eventually resulting in higher fodder crop prices and decreased fodder crop supply. Instead of fodder crops wheat and rice stems with lower feed value were main part of livestock feed ration. Deterioration in irrigation infrastructure caused unreliable water and thus feed availability. Newly introduced farmers faced input and output price parity problem receiving lower state prices for cotton and wheat they produced while purchasing inputs and machinery in market prices. Particularly in livestock sector, many processing industries stopped functioning in new conditions of market transition period. Adoption of the Presidential Resolutions No 308, dated 23 March, 2006 on “Measures for stimulating of livestock expansion in household plots, households and private farms” and No 842, dated 21 April, 2008 on “Additional measures for strengthening livestock expansion in household plots, households and private farms and escalation of livestock production” began new support to livestock husbandry which is today main branch of agricultural sector with 46.3% share in the gross agricultural output of Uzbekistan.

Despite the achieved progress there is still a huge scope for improvement in the livestock sector, particularly in the north western regions of Uzbekistan which is located in down-stream areas of Amu Darya. One example is that although household (HH) farms having 93% of cattle are major producers of meat and dairy products, tiny size of the HH farms pose significant challenges for application of modern technologies and limits potential economies of scale effects. This in turn led to relatively low levels of the sector’s efficiency [Yusupov et al. 2010]. Another problem is that considerable decrease in the areas under feed crops and frequent water shortages at the tail end regions of the Amu Darya Basin resulted in feed insufficiency for livestock. According to livestock scientists and practitioners, 60-65% of fattening rate of livestock and their yields are related with feeding [Juraev 2004].

Considering the rareness of studies on livestock breeding in Central Asia in the last two decades, the purpose of this paper is to discuss the major problems of livestock production in the water scarce region where market reforms are gradually taking place. The paper aims also to discuss possible options for improvement on the basis of results of socio-technical analysis. The problems discussed includes, on one hand, access to and availability of main inputs such as fodder crops, irrigation water, credits and bank services, fertilizers, petroleum, and technical services. On the other hand, trading opportunities of livestock outputs via different marketing channels were discussed.

### Methodological approach

The research was conducted in the Khorezm region, 680 thousand hectares large administrative district located in the lower reaches of the Amu Darya River in Northwest Uzbekistan (41°41' N latitude, 39°40' E longitude and altitude 113 m). Irrigated agriculture dominates in the regional economy with more than 50% share in total regional income and thus livelihoods are very vulnerable to water availability. Khorezm borders the southern edge of the ecologically degraded Aral Sea zone and is one of the most problematic areas regarding salinity, irrigation water availability and overall crop performance [Martius et al. 2004]. The region is surrounded by the deserts Karakum and Kyzyl-Kum, which determine the arid sharply continental climate as characterized by hot summers with temperatures rising to +45°C and cold winters with temperatures falling as low as -20°C [Glazirin et al. 1999]. The research was carried out under the title "Livestock production in Khorezm region, Uzbekistan" and organized by ZEF/UNESCO Uzbek-German project together with Urgench State University (UrSU). In order to comprise wider area of Khorezm region and taking account of variability in financial conditions of households and farmers across the region, Stratified Random Sampling method was used [Ardilly et al. 2006]. Livestock activities in 56 livestock farms (LF) and 80 HH farms are surveyed. The research data was obtained via direct interviews of farmers based on open and close questions executed from January to June 2008.

### Survey results

**Purchasing cotton by-products.** During the period of survey, the most important problem for both of LF and HH farmers was the difficulty in purchasing cotton by-products (68 % and 56 % respectively) as cotton seedcake, cotton husk and mixed concentrates (Tab. 1). Those feeds could be purchased from one and only commodity exchange point in Urgench city, the administrative center of Khorezm region. All LF farmers had to visit the commodity exchange point to purchase fodders regardless of their farm locations. In order to purchase fodder with lower prices, LF farmers had to visit the commodity exchange several days, or had to purchase fodder with higher prices if it is urgent. Considering these issues Uzbekistan President's decree PQ-842 to increase the number of livestock in rural HH and LF farms, and to develop the production of livestock commodities was adopted on April 21<sup>st</sup>, 2008. In result, 11 district associations and 99 fodder trade centers were established in the second half of 2008 [Khorezm Regional... 2009], but after farm survey was finished. Those trade centers solved all livestock producers' major problem by making by-products easily available to purchase. However, currently the availability of these fodder commodities is limited as fodders are being allocated monthly per nominal<sup>1</sup> cattle head per month. The allocation will be based on the amount of processed crop by-products from cotton plant and grain mills. Thus, this major problem of livestock producers is partly solved nowadays.

**Irrigation problems.** Second major problem of livestock producers is related with irrigation that 52 percent LF farmers and 41% of HH farmers had complaints (Tab. 1). Majority of LF farmers who complained about water shortage have mentioned that, they always have to use pumps to get water to their lands and it is very costly for them. At 56 interviewed LF farms, there are total of 16 big electric pumps, 3 Altay tractor pumps, 10 small tractor pumps and 30 other types of small pumps available. If there is enough water in the canals, some LF farmers are even able to get water without pumps. However, 2 LF farmers (about 4%) are completely unable to get water from canals, thus using collector and lake water, as faced to difficulties in bringing water from far distances. LF farmers are usually using big electric pumps or tractor (petroleum) pumps, where both of the pumps have advantages and disadvantages. LF farmers who use tractor pumps have to spend

<sup>1</sup> The Uzbek „nominal cattle” unit is calculated as cattle (cows and bulls) and horses equalling 1, calves 0.6, sheep and goats 0.1, pigs 0.3 and poultry 0.025.

**Table 1. Problems interviewed farms**  
**Tabela 1. Problemy badanych gospodarstw**

Problems of LF and HH farms/ <i>Problemy badanych gospodarstw i przedsiębiorstw rolniczych</i>	No of LF farms/ <i>Liczba przedsiębiorstw</i>	No of HH farms/ <i>Liczba gospodarstw</i>	% from total LF farms/ <i>% udział w grupie przedsiębiorstw</i>	% from total HH farms/ <i>% udział w grupie gospodarstw</i>
Difficulties in getting crop by-products from fodder-exchange/ <i>Trudności w uzyskiwaniu produktów ubocznych roślin pastewnych z wymiany</i>	38	45	68	56
Problems with irrigation/ <i>Trudności z nawadnianiem</i>	29	33	52	41
Financial difficulties/ <i>Problemy finansowe</i>	21	-	38	-
Getting difficulties and high rates for bank credits/ <i>Trudności z uzyskaniem kredytu bankowego</i>	19	3	34	4
Difficulties in getting fertilizers/ <i>Trudności z dostępem do nawozów</i>	18	34	32	43
Difficulties in building animal-houses/ <i>Trudności z budową obór</i>	17	-	30	-
Problems in selling products/ <i>Problemy ze sprzedażą</i>	16	-	29	-
- milk/ <i>mleka</i>	6	-	11	-
- wool/ <i>welny</i>	5	-	9	-
- others/ <i>innych produktów</i>	5	-	9	-
Lack of technical supplies in sowing and harvesting/ <i>Brak maszyn do siewu i zbioru:</i>	12	1	21	1
- in sowing/ <i>do siewu</i>	5	-	9	-
- in harvesting/ <i>do zbioru</i>	7	-	13	-
Problems with land/ <i>Problemy z zakupem ziemi</i>	10	18	18	23
Difficulties in getting petroleum products/ <i>Problemy z zakupem oleju napędowego</i>	9	-	16	-
Fodder scarcity/ <i>Niedobór pasz</i>	1	22	2	28
Other various problems/ <i>Pozostałe</i>	11	10	20	13

- not mentioned by farmers as problem/ *niewskazane przez badanych jako problemy*

Source: own study

*Źródło: opracowanie własne*

much for petroleum but will be able to get water whenever they need. In contrast, the LF farmers who use big electric pumps are enjoying with cheaper costs of getting water, but with the risk of not getting water from canals during the electric cut-offs. Thus, the better option is having both tractor (petroleum) and electric pumps in the small-sized LF farms, even though it is financially difficult. HH farms have two farm lands, where one is situated in front of living house and the second is somewhere different, but have similar problems in irrigation of both HH lands. Only about 30% of HH farms have access to water use without costs. Over 60% of HH farms water their lands by pumps with having continuous watering costs, where around 10% have changeable access to cheap and costly watering. However, in order to water the HH plots, only 6 from 80 HH farms (8%) have own water pumps. The rest of the farmers use the pumps of other private farms by paying for petroleum and maintenance costs.

**Financial problems.** Third major problem mentioned by 21 LF farmers (38%) is facing financial difficulties to implement intended plans. Some of the LF farmers already got bank credits for intended reasons, but as it is not enough for their needs, would like to get bank credits again for other purposes. However, they are unable to show guaranties to banks to get credits. Therefore, those farmers mentioned themselves as having financial difficulties. But, none of HH farmers mentioned themselves having financial difficulties, as livestock at HH farms are considered as secondary source of income for the family budget.

Although next major problem is related with financial difficulties, it is more about high interest rates of getting bank credits for 19 LF farmers (34%) and 3 HH farmers (4%) (Tab. 1). For instance, one LF farmer bought a new tractor for 23 million Uzbek sums by getting bank credit with 16% interest rate and for 3 years period and another LF farmer bought old tractor for 4 million Uzbek sums by getting bank credit with 14% interest rate. Many LF farmers mentioned that, in rare cases one can get bank credits with lower interest rates. For example, one LF farmer got 5 million Uzbek sums for credit with 8% of interest rates. However, other LF farmers named the farmer who got lower interest rate as "lucky" to get that credit. According to the interviewed LF farmers, the usual bank credits possible to get are not less than 14%. For instance, LF farmers who would like to purchase Ukrainian red steppe cattle (around 2.5 million Uzbek sums per cattle head), which are brought by Regional breeding farm to improve the efficiencies of local breeds, can get bank credits with 14% interest rate. This interest rate is considered as too high for LF farmers to agree, but many have no other options. But, many of HH farmers have opportunity to get special low interest rate bank credits, offered from Government for cattle producers based on the President's decree PQ-308, dated March 23, 2006. This could be the reason that it is not problem for many HH farmers. The problems of HH farmers, who complained about this, are related with the certain limits of those credits per HH farms.

**Fertilizer use.** Next major problem mentioned by 32% of LF farmers and 43% of HH farmers was difficulties in getting fertilizers (Tab. 1). According to LF farmers, there will not be enough fertilizers available in the markets when needed. Thus the prices will be higher than usual. Moreover, among fertilizers urea requires special registration about its usage, which requires additional documentations and times from farmers.

**Building animal houses.** Although building animal houses are difficult for 30% of LF farmers for various reasons, it is not mentioned from any of HH farms as problem as they have enough animal houses for their small number of livestock. Some LF farmers do not have enough finance to build animal houses as they wished. Three LF farmers (5%) are not permitted from Government to build animal houses inside the farm area, as the entire farm fields are irrigated lands only. Additional place can be allocated from Government, but somewhere far from farm fields at non-irrigated lands. The case seems quite reasonable but requires more additional finance from farmers for transportation.

**Markets for livestock commodities.** Product marketing of LF farms needs improvement as almost 30% of LF farmers faced various problems of selling products. For example, According to 11% of LF farmers, selling milk is difficult as they can sell their milk in the city markets, which is far from the farm and costly to visit every day. Moreover, LF farmers do not have special milk containers to keep much amount of milk without spoiling for longer period or even if they had it would be difficult to store milk in containers in conditions of frequent electric cut-offs. The major customers who can make contract for continuous purchase of milk with much amount are only hospitals and kinder gardens in the districts. However, one farm is enough to produce required milk amount for each of those organizations. The rest of the LF farms have to sell their milk in district centers or Urgench city to processors or directly to public consumption with having additional transportation or storage costs. Another alternative could be selling milk to milk traders with lower prices. Selling products is not mentioned from any of HH farmers. The reason could be already available motivated marketing system of milk organized by milk trader, as milk is being collected two times in a day and HH farmers are getting paid directly upon purchase. However, the milk traders are collecting milk from various customers every day and selling to processors or direct public consumption every day. In such conditions, the traceability of possible diseases is difficult and might be a major threat for public health.

Half of the LF farms (11 from 22 LF farms), who are keeping sheep and producing wool, are unable to sell the wool they produced. Therefore, majority of this wool is being left as useless. According to LF farmers and HH farmers, the amount of wool per sheep at both of LF and HH is 2.3 kg in average. This would result in total of 766 tons of wool produced in the whole Khorezm region in 2008 [Annual Statistical... 2008]. However, there is no any processing industry of wool in the Khorezm region. The only possible customers of the wool are very little number of local handicrafts men who produce carpet, rope, winter socks, winter gloves and scarves (neckerchiefs).

Equally interestingly, it is worth to mention that, there are any cattle leather processors available in the Khorezm region. Based on the calculations regarding leather, following are established. According to farmers, 16% of livestock at both of LF and HH farms is at the fattening process and this process usually takes 1 to 2 years. Thus, the number of total cattle in the fattening process in Khorezm region will be 105 thousand. We assume that the half of those cattle are being slaughtered annually amounting to 52.5 thousands. In other words, 52.5 thousand cattle leather is being produced in Khorezm region, but any is being processed inside the region.

**Technical supplies.** Machinery and equipments are important for both of LF and HH farms in order to improve their production. However, although 56 LF farms have more machinery (90 tractors, 13 lorries, 9 combines and 69 trailers) than those of 80 HH farms (14 tractors with 9 trailers), 21% of LF farmers complained about the deficiency of technical supplies, where almost nobody complains about this among HH farms. Total number of combines at 56 LF farms to harvest grains is 9 and number of forage cutting machines is 11. As LF farms do not have enough combines in order to harvest grains and forages, use the services of Machine and Tractor Parks or private combine owners. However, farmers can also use hand force of temporary employees to harvest grains and forages. The lack of combines and machines also causes to lack of silage making at LF farms. In addition, although the rice and wheat straw is one of the major fodders of cattle, there are only 2 straw bunching machines at 56 LF farms. However, purchasing new machine and equipments will be too expensive for LF farmers. For instance, according to LF farmers, the prices of combines are around 160 million to 200 million Uzbek sums (100-125 thousand USD, in 2008, NBU<sup>2</sup>). Besides, available combines in the markets are from Chinese and Russian companies, which are expected to be relatively cheaper than the ones made in Europe. However, LF farmers would like at least to have equipments available enough for their old machines.

**Land for forage crops.** Next problem of 18% of LF and 23% of HH farmers is related with land scarcity and inequality at allocation. Majority of LF farmers and HH farmers would like to get additional land in order to improve their livestock production. Although it is difficult issue to solve as the land area is limited in the Khorezm region, land allocation as the next part of the problem requires some attention. According Cabinet of Ministers [2003], LF farmers in Khorezm can hire 0.3 hectare land per nominal cattle. But, the quality of the lands (bonity or growth class) is not mentioned in the Decree. Thus, farmers mentioned this as inequality in land allocation, which should be solved. For instance, one LF farmer has land bonity (quality) of 25-26, where another LF farmer has land bonity of 40-45. Similarly, one LF farm is situated very close to irrigation canal and has easy access to water, where the other one is situated very far from the canal and has to spend much time, effort and money for irrigation of the farm land. Eventually, both of those farms are being expected to have same efficiency in livestock production.

According to 16 percent of LF farmers petroleum prices are expensive, the provision place is far to get, and sometimes unavailable when needed. Although HH farms do not care much about this problem, almost 30% of them worry about fodder scarcity, where LF farms seem no worries in this case. Fodder quality (hays) seems not good for 14% of HH farms, the prices are expensive for 13% of HH farms and the distance is far to get fodder for 1% of HH farms.

## Discussion and conclusions

Socio-technical analysis of the current state of livestock producers in the Khorezm region revealed several problems which are much more related to dysfunctioning of appropriate market mechanisms for input and output commodities. Only recently considering the severity of the feed supply problem as well as potential of livestock sector in income generation and food security, set of trading branches started offering cotton by-products in rural areas. Despite this positive change, there is still huge scope for improvement along the livestock value chain. Irrigation water availability and high pumping costs are the main problems of many farmers. Appropriate institutional reforms in the water sector, improvements in operational regulation and introduction of more efficient technologies would allow increased availability of water resources [Bekchanov 2010]. Land availability and feed sufficiency is also related with water use issues and land ownership rights. Current state of ownership rights and unreliable water supply does not create incentives to farmers to make investments on land to improve its productivity and thus increase forage supply.

Lack of credit, scarcity of machines and equipments, high labor intensity, large price parity between input and output prices and the small size of the farmers make together another cycle of causal relationships. Small size of household plots and livestock farmers prevents them to gain enough profits using the potentials of economies of scale particularly under the conditions of state quota system for cotton and wheat with free markets of input commodities. As a consequence low profitable farmers cannot make investments to new machinery and had to use old machinery and equipments neglecting its depreciation period. Once the technical system stopped functioning they will compensate it hiring more labor and at the expense of some reduced yield. Surely low

<sup>2</sup> NBU – National Bank of Uzbekistan official state exchange rate.



profitability and lack of fixed capital reduces opportunities to have an access to bank credits. Output markets also suffer from lack of appropriate marketing infrastructure, potential processing industries and remoteness of the region from other national trade centers. Additionally, it needs to be also emphasized that apart from input and output problems there also exist issues related to the basic processes of livestock production and processing along the supply chain that need to be developed too. Those are associated with low level of value adding at different stages of supply chain. Thus there is required a knowledge management and inflow for both HH and LF farms.

Further support of livestock processing industries and improving input and output marketing channels would result in better performance of livestock industry and consequent increase in incomes as well as improvement of their technical base.

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### Streszczenie

*Produkcja zwierzęca Uzbekistanu wytwarza 46.3% produkcji rolnej brutto i stanowi jedno z głównych źródeł zaopatrzenia w żywność mieszkańców tego środkowoazjatyckiego kraju. W wyniku transformacji ustrojowej gospodarstwa państwowe specjalizujące się w produkcji zwierzęcej zostały zlikwidowane. Obecnie produkcja odbywa się w prywatnych gospodarstwach rolnych i nowo powstałych prywatnych przedsiębiorstwach produkcyjnych. Celem artykułu była analiza podstawowych problemów związanych z produkcją zwierzęcą w Uzbekistanie i wskazanie możliwych rozwiązań trudnej sytuacji. Na podstawie bezpośrednich badań przy wykorzystaniu kwestionariusza ankiety w 56 gospodarstwach i 80 przedsiębiorstwach w regionie Khorezm dokonano analiz przekrojowych sytuacji produkcji zwierzęcej w Uzbekistanie. W ich wyniku zidentyfikowano problemy na wejściu do łańcucha żywnościowego takie, jak: wysokie ceny środków produkcji, ograniczony dostęp do kredytów bankowych, ograniczona ilość wody i gruntów pod budowę obór oraz zbyt mała skala produkcji ograniczająca rolników do podejmowania inwestycji w maszyny i technologie. Jako problemy na wyjściu zidentyfikowano brak bezpiecznych i niezawodnych kanałów sprzedaży.*

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