



## **UZBEKISTAN: A REPORT on LIVESTOCK and the PROVISION of VETERINARY SERVICES**

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## Abstract

Following the breakup of the Soviet Union the agricultural sector in Uzbekistan has undergone a deep restructuring. Private ownership of land is currently prohibited by law, as is the use of land as collateral for receiving bank loans. However, several new laws enacted since 1992 have created favourable legislative conditions for a variety of types of farming. The most recent reforms of 2018/2019 aim at the establishment of private farm clusters based on contract farming, replacing the state procurement system. Currently there are 4.7 million *dekhkan* (smallholder) farmers with land plots of 0.35–0.5 ha and largely based on household labour. Thanks to the hard work of these farmers, livestock currently constitutes 40% of total Uzbekistan agricultural output. During the last two decades the number of cattle and sheep/goats has more than doubled. However, despite recent improvement in the agricultural economy there are some barriers restraining production efficiency of the agri-food sector such as a) weak access to finance, b) poor animal health due to weaknesses of the public and private veterinary services and poor animal feeding, c) inadequate supply of fodder due to the small amount of land which can be used to produce fodder (only 5%), and d) the cultural loss of experience in the agricultural and farming business after the demise of the Soviet era. Productivity of livestock could be the key for further income gains for families in rural areas as livestock-keeping activities contribute from 45% to almost 70% of family income depending on areas of the country considered. The promotion of more effective and viable veterinary services requires the creation of an enabling environment to encourage the private sector through provision of incentive packages such as access to better technologies and training; improving the budget allocation to facilitate provision of essential public animal health infrastructure; strengthening the capacity of Zoo-Vet Stations and establishing a reporting system such as Animal Identification Database to facilitate collection of information on veterinary drugs/vaccine performance.

**Key words:** Uzbekistan; Livestock Production; Cattle; Sheep; Poultry; Meat; Milk; Veterinary Services

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## Introduction

Uzbekistan is a country roughly the size of France (total area of 447,400 km<sup>2</sup>) with the largest population in Central Asia of about 34.5 million<sup>1</sup>, and is characterized by deserts and mountains with only 9.6% of arable and irrigated land. The country has huge environmental problems deriving from decades of environmental neglect under the Soviet Union. The diversion of water from the two rivers Amu Darya and Syrdarya for cotton cultivation and industrial purposes contributed to the dramatic shrinkage of the Aral Sea creating what is considered the greatest ecological and social tragedy of the XX century. The resulting desertification has increased soil salination due to spread of salt from the evaporated Aral Sea bed, particularly in the northern Republic of Karakalpkastan (Figure 1). Soil degradation, coupled with heavy use of agrochemicals and lack of water treatment plants, has caused growing concentrations of chemical pesticides in underground water supplies in much of the North and Central parts of the country. Despite some recent improvements in the general environmental conditions, particularly of Central and South-Eastern Uzbekistan, environmental contamination

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<sup>1</sup> <https://stat.uz/en/>



remains a public health issue especially around the Aral Sea, as demonstrated by maternal and infant morbidity and mortality rates being among the highest in the former Soviet states.



**Figure n. 1** – An area of salinated soil north of Nukus (Republic of Karakalpakstan, Uzbekistan). The diversion of water from the two rivers Amu Darya and Syrdarya, both tributaries of the Aral Sea has caused a dramatic shrinkage of the Aral Sea bed. The resulting salination makes the land often unsuitable for agricultural purposes.

Since its independence from Soviet Union on August 31, 1991, Uzbekistan has been dealing seriously with its environmental issues in an effort to stimulate its economy and improve life conditions, especially outside of the largest cities and in rural areas. The agricultural and livestock sectors have been the subject of a number of reforms because of their important role played in the Uzbekistan economy, employing about 40% of the population and producing one third of the country's gross domestic product (Abruev et al., 2015). Nowadays, Uzbekistan's agricultural production still

consists mostly of cotton, of which Uzbekistan is the fifth largest world producer and was the third largest world exporter until recently, and wheat. Following independence, the government opted for a slow “step-by-step” path in reforming agriculture; strong state control of production and marketing of “strategic crops” still continues today as government agricultural policy is currently aimed at further developing cotton and wheat production to support state hard currency earnings through export, and achieving self-sufficiency in grain production. However, the government of Uzbekistan started diversification of agricultural production in 2017, whereby cotton will be gradually phased out in some areas to be replaced in favour of food crops such as fruits and vegetables. The aim of this document is to review the current situation of the Uzbekistan livestock sector, and type and organization of veterinary services in order to highlight areas of potential intervention of the BUZNet project<sup>2</sup> which may help improve animal health, increase production efficiency of the livestock sector and therefore raise farmers' profitability as well as the country's economic growth.

## Uzbekistan Farms

**Types of Farms and their restructuring** – The collectivization of the agricultural sector in Central Asia which occurred during the 1930s' met with peasant resistance and protest with villagers often turning to violence and committing acts of sabotage among which were the burning of crops and the slaughter of animals, both of which contributed to the famines of the Soviet period (Courtois et al., 1999). At the time of independence in 1991 Uzbek agriculture was still characterized by large-scale, state-funded *sovkhos* farms and self-financed *kolkhoz* farms. Performance levels and output prices were set by state procurement targets, which caused discrepancies between the actual potential production of single farms and what the government was expecting of them with continuous losses in agricultural and livestock production (Djanibekov et al., 2012). Following the breakup of the Soviet Union the agricultural sector in Uzbekistan has undergone deep restructuring. The allocation of land to producers has occurred through leasing contracts resulting in the development of three different types of farms: large private farms (*shirkats*, previously state-owned cooperatives), smallholder or *dehkan* farms and private or *fermer* farms. Agricultural Cooperatives (*Shirkats*) are the legal successors of the former *kolkhozes* and *sovkhozes*, which deal mainly with the production of the strategic crops cotton and wheat. At the beginning of each year the *shirkat* administration receives a state order plan for cotton and/or wheat production quotas that require them to allocate a defined area of land to these crops. The provision of credit, input, and output markets for cotton and wheat are

<sup>2</sup> <https://buznet.up.pt/>

partly administered by the Government which identifies the amount of production. Growing crops different from the state order is prohibited (Robinson, 2020).

Individual or Household Farms or *Dekhkan Farms* – *Shirkat* employees and private farmers have an additional source of income from personal household plots of less than 0.35 hectares call *tomorka*. An initial allocation of 0.024 ha to the *dehkan* families in rural areas was accomplished in the early 1990's. Since independence the total area under these smallholdings has increased significantly and has reached 750,000 ha. The *tomorka* are usually located on former *shirkat* lands and are geared primarily towards agricultural production. House construction is prohibited on these lands. Since 2000, the state has encouraged farmers to register their *tomorka* as *dekhkan farms* on the basis of long term (50-year) leasing. The registration helps farmers to receive credit. This type of production could be considered as a purely private type because *dekhkan* farmers make independent decisions on production and marketing. Limiting factors are the size, location of the farm, irrigation and lack of mechanical equipment (Figure 2). Currently there are 4.7 million *dekhkan* farmers with land plots of 0.35–0.5 ha and they are largely based on household labour. *Dekhkan* farmers are not subject to control by the Government but are also not provided with any relevant public services (access to fertilizers, fuel, machinery, credit etc.) (World Bank report, 2021). However, as *dekhkan* farmers virtually “own” their land they invest in it trying to orient their production towards more profitable and less water-demanding products (Robinson, 2020).



**Figure n. 2** – Working and irrigating the land by hand on a *dekhkan* farm in central Uzbekistan. *Dekhkan* farms are characterized by small land plots (0.35-0.05 ha) and are generally based on household labour. The cost of mechanized equipment is a serious constraint for the development of agriculture in Uzbekistan.

Private or Family Farms or *Fermer Khohajaligi* are a new market-oriented production unit averaging about 20 hectares nationally whose number increased rapidly in the late 1990s (reaching about 63,000 in 2002), and accounting for almost 1.2 million hectares in 2002 (Zorya et al., 2019). Similarly to *dekhkan* farmers, private farmers may lease land from the state for up to 50 years. However, in several provinces only 15-18 % of farmers have leased land for 50 years, with 80-82 % of farmers receiving land for 10 years and only 2 %

receiving land for 20-30 years. According to the Law on Farms (1992), private farmers are fully independent from local authorities and *shirkats* in organizing agricultural production. However, private farmers also have to produce state-ordered crops, limited not only to cotton and wheat, but also including fruit, and vegetables. In 2007 there were approximately 75,000 private farms, with land under 30–50-year leases. Private farms utilize 5.8 million ha of state-leased land (including uplands and pastures) with an average farm size of 75 ha (Robinson, 2020).

*Shirkat* farmers dominate wheat and cotton production (under tight governmental control), while *dekhkan* farmers dominate the horticulture and livestock subsectors (which are much less controlled by the Government); *fermer* farms are mostly involved in livestock production and account for the majority of sheep and goat production. In 2004 all *shirkats* were transformed into *fermer* farms, whose number reached its maximum level of 220,000 units in 2007. Unsatisfied with the productivity of individual farms, and aware of a mismatch between water supply infrastructure and farm sizes, the government started consolidating farms in 2008. However, government-driven increased farm size has not produced the expected positive outcomes of economy of scale due to a variety of reasons among which poor soil quality, insufficient water, high production costs and government driven low pricing for cotton and wheat. After 2015, the diversification of crop rotations away from cotton and wheat became a major focus, and farm numbers increased again. Production of



wheat has increased yet national needs are still being met by imports which in 2019 accounted for 43% of national production, up from 25% in 2010 (World Bank report, 2021). The government currently also aims to increase the output of fruits, vegetables, milk and livestock, whose production is highly favoured by *dekhkan* farmers as prices of these commodities are not regulated by government but follow market rules. In fact, the fixed pricing of cotton and wheat has been the indirect cause for the rapid increase in the number of cattle herds during the last decade. Farmers are expected to be integrated into multi-profile farms, which may engage in agricultural production and processing, preparation, storage, marketing, and provision of other services. The most recent reforms of 2019<sup>3</sup> aim at optimizing farmland use through an increase in wheat- and cotton-producing farm size and establishing private cotton-textile and wheat clusters based on contract farming, thus replacing the state procurement system. The Government expects that the clusterization of the cotton sector, which started as a pilot project in the Navoi region, will ultimately involve up to 50% of the total agricultural area of the country. By attracting private investment, this strategy is intended to generate higher agricultural output than previous initiatives of farm restructuring (Petrick and Djanibekov, 2019). A strategy to reform state-owned enterprises and gradually reduce them by 75% during the period 2021-25 was approved by the Government in early 2021 (World Bank, 2021).

## Uzbekistan Livestock

Livestock production in the Central Asian republics suffered a serious setback after the demise of the Soviet Union in 1991. However, Uzbekistan was the only country in which livestock numbers did not plummet but rather remained stable for a decade. Since 2002 the Uzbek national livestock herd number has shown a steady increase reaching 1.5 times its 1991 levels (Oripov and Davlatov, 2018; Robinson, 2020). Livestock is currently considered as one of the more dynamic sectors of Uzbek agriculture, accounting for over 40% of the gross national agricultural output (Oripov and Davlatov, 2018). Interestingly, the vast majority of livestock are owned by, and reared, on *dekhkan* farms in spite of their small size (*dekhkan* farms use less than 15% of arable land) (Robinson, 2020). *Dekhkan* farms, family farms and *shirkhat* cooperatives account for 94%, 5% and 1% of cattle ownership and 84%, 8% and 8% of sheep/goat ownership, respectively (Robinson, 2020).

**Geographical distribution** –The distribution of livestock production farms is determined by proximity to population centres and agro-ecological zones. Dairy production is concentrated in irrigated areas close to urban centres, and beef production is mostly concentrated in low mountain pastures. Small ruminants which are used for meat, as well as skins and wool, are raised in semiarid and desert locations in the west, where horses and camels are also reared; karakul sheep rearing occurs mostly in *shirkats* (Figure n. 3). Poultry production is found countrywide in *dekhkan* farms but large scale poultry production units are quickly developing in suburban areas of large cities. In addition, there are over 100 karakul sheep *shirkats* and a small number of cattle *shirkats* in higher rainfall pasture areas although most of these *shirkats* are being reorganized through auction by the Government. The karakul *shirkats* are important because they control large areas of arid rangeland mainly in the northwest of the country. Over the last two decades the production of cattle and sheep/goats has increased from 674 and 138 (in 2000) to 1,869 and 381 (in 2020) thousand tons of liveweight, respectively; during the same period bovine milk production has increased from 3,612 to close to 11,000 thousand tons<sup>4</sup>.

**Constraints to Development** - Despite recent improvement in the agricultural economy thanks to government-driven reforms, there are some barriers restraining production efficiency, lowering the income in the private sector of the agri-food economy. These are briefly summarized here.

- *Weak access to finance* – Access to financial services in Uzbekistan is the lowest among all Central Asian countries<sup>5</sup>. Uzbek farmers have difficulties in financing their enterprises. Public and private banks do offer credit services to farmers albeit at prohibitive (18-24% annual) interest rates, and even when rates are affordable administrative requirements are fairly complex (Naumov and Pugach, 2019). This has to do with the financial sector being undercapitalized (because of inadequate liquidity and lack of independence) but also the agricultural sector being characterized by high production risks, high transaction costs of lending to small livestock producers and an

<sup>3</sup> The Resolution of the Cabinet of Ministers No. 14 from January 11, 2019.

<sup>4</sup> <https://stat.uz/en/official-statistics/agriculture>

<sup>5</sup> World Global Index Database (2017) <https://globalindex.worldbank.org/>



inadequate supply chain finance and low productivity. High production risks and low productivity are the result of a combination of factors including animal health, animal feeding, and genetics (Naumov and Pugach, 2019).



**Figure n. 3** – A shepherd with his Karakul sheep from western Uzbekistan (Bukhara Region, Uzbekistan). Small ruminants are mostly used for meat, skin and wool and are frequently raised in semiarid and desert locations in the northern and western regions of Uzbekistan

- *Animal health* - Animal health is constrained by weaknesses in public and private veterinary services and exacerbated by poor animal feeding. Animal feeding is constrained by limited land availability of fodder and the abandonment of cotton/fodder crop rotations, degradation of pastures, and the limited availability and cost of concentrate feed. Animal genetics is constrained by low knowledge and weak breeding strategies at farm level, inadequate artificial insemination

infrastructure and services (lack of reproductive management, poor heat detection, low herd health management efficiency), and the loss of local genetic resources for phenotypes adapted to Uzbekistan's climate.

- *Restriction of fodder production* – In Uzbekistan there is an inadequate supply of fodder due to the fact that cotton and wheat production quotas severely restrict the amount of land which can be used to produce fodder (only 5%). Since 2006, private cattle farms with at least 30 heads of animals have been allocated an additional 0.45 ha of arable land per animal head for fodder production. In 2015, the Government reallocated 170,000 ha of cotton/wheat land to other crops, including fodder production, to help address the lack of fodder. Cotton seeds are still frequently used as fodder for dairy cows (Figure 4).
- *Loss of local farming knowledge* - One of the most important factors which has thwarted (rural) economic development is the cultural loss of experience in the agricultural and farming business after the demise of the Soviet era. Local agricultural and farming culture has been 'lost' during the period of Soviet colonialism. With collectivisation in the 1920s, livestock production was transferred from an almost purely domestic affair into a collectivised and specialised industry of the state. Despite post-WWII reforms of agricultural production allowing for limited domestic production of livestock within the household economy, large amounts of indigenous knowledge – previously transferred directly from parents to their children - had already been lost at that time. With de-collectivisation and the breakdown of existing collectives occurring post-1991 this attrition of knowledge continued, and the healing process is quite slow (Wall and Evers, 2006).

Governmental efforts to address some of these constraints have included tax exemptions, input subsidies, additional veterinary services, and lower interest loans for the purchase of livestock (Abruev et al. 2015). An improvement of veterinary manpower and professionalism with particular reference to animal breeding and genetics, animal feeding, artificial insemination and reproductive management is considered vital to allow any substantial improvement of economic development of the Uzbek agri-food business, which was highlighted in the "Agricultural development strategy for 2020-2030"<sup>6</sup>

<sup>6</sup> Presidential Decree #5853 "On Approval of the Agricultural Development Strategy of the Republic of Uzbekistan for 2020-2030"

Co-funded by the  
Erasmus+ Programme  
of the European Union



23th October, 2019



## Livestock Industry in Uzbekistan

The livestock industry of Uzbekistan is characterized by the historical presence of cattle breeding and sheep breeding while poultry and rabbit breeding as well as fish farming are currently being developed. Cattle breeding is highly developed in irrigated zones. Cattle-breeding farms are concentrated in *dehkan*, collective and cooperative farms where cereal crops and cotton are also produced (both of which are used as animal feed). Cattle raised include Black-motley, Red steppe, Schwitz and Bushuev cattle, as well as local Zebu-type breeds. Several farms also raise Holsteins from The Netherlands, Poland and Austria. In steep, mountainous and foothills zones, as well as in semi deserted zones cattle breeds like Schwitz,



**Figure n. 4** – Cotton seeds used to as part of the daily ration for dairy cows in a shirkat farm near Nukus (Republic of Karakalpakstan, Uzbekistan)

Santa-Cruz, Kazakh white-headed and their cross-breeds with local indigenous cattle play a fundamental role in maintaining an important genetic stock. Stock-breeding as a whole is concentrated and developed in *dekhkan* and *fermer* farms.

The government policy has mainly been directed to maintaining the number of livestock even if this has negative effects on productivity. In fact, since independence the number of cattle has increased at an annual growth rate of 5% in

all types of farming, while by contrast the number of sheep and goats has initially fallen by 12%. When compared to other former Soviet countries, Uzbekistan has not seen a decrease in the quantity of its livestock during the transition from the pre-reform period to 1991 and beyond. However, since independence, significant institutional changes have occurred which have affected livestock numbers according to farm types. There has been a decline in the number of all types of livestock held by large agricultural enterprises and an increase in the quantity held by household farms, except for pigs and poultry. Poultry production has collapsed in all types of farming systems due to the lack of specialized feed, medicines and veterinary care and loss of local knowledge. Since 1998, pig production has shown signs of improvement due to the development of the sausage industry, for which pork is a basic ingredient.

The second most frequently owned type of livestock is sheep and goats, of which *fermer* farms raise more than 4 times on average than *dekhkan* farms in most regions. Many small holdings own horses in the Bukhara province, while in some other provinces such as Syrdarya this number is insignificant. A negligible number of private farms raise pigs.

The main characteristic of the sector is that the majority of livestock products are from *dehkan* households which produce more than 94% of the beef/mutton/chicken, 95.6% of the milk, 85.4% of the wool and 57.3% of the eggs. They own more than 11.5 million head of cattle (94% of the total cattle population), 16 million head (or 83%) of sheep and goats, 85% of horses and 63% of chicken<sup>7</sup>. As of January 1, 2019, the total cattle population was 12,726 million heads<sup>5</sup>. Private livestock farms, meanwhile, produce only 2.9% of the beef, 3.6% of the milk, 10.7% of the eggs and 8% of the wool of the total livestock production. Specialized commercial farms or agriculture enterprises are called AgriFirms and their contribution in meat production is about 2.7%, in milk it is less than 1%, in wool less than 7%, while their egg production constitutes 1/3 of the total number of eggs produced<sup>5</sup>.

Livestock productivity in Uzbekistan is very low compared to the European level. Analysis of the available data for agricultural enterprises indicates a sharp decline (by more than a half) in milk productivity/cow and eggs laid/hen occurring after 1991. In the surveyed farms, the average milk yields in litres per day were 9.6 in summer and 6.7 in winter. The average numbers of eggs laid per hen per month were also very low: 10.0 in winter and 13.2 in summer. However, since

<sup>7</sup> <https://stat.uz/en/official-statistics/agriculture>





the second half of the 1990s the State has taken serious measures to improve animal vaccination services and provide protein-rich feed. As a consequence, the cattle as well as the small ruminant population in Uzbekistan have more than doubled since 1991 resulting in an increase of the contribution of livestock production to the gross agricultural output from 30-35% in the 1980's to 46% in 2016<sup>4</sup>. This has had a positive effect on human welfare in the country, increasing rural incomes and contributing to increased availability of animal proteins in rural and urban household diets. However, the need for livestock feed in the country is 120 million tons, but only 47 million tons were produced last year<sup>8</sup>

### **Animal Breeding in Uzbekistan**

There is a continuous effort by the Uzbek State Programme for Livestock Development to improve the quality of livestock breeds (Lerman, 2008; Eshonqulovich et al., 2018). However, there are still critical issues hampering animal breeding services such as insufficient research support for pedigree breeding; insufficient pedigree stock and frozen semen procurement from abroad; insufficient feed resources and veterinary services; lack of required hygiene norms in livestock management; and incomplete public awareness about the importance of pedigree breeding. A number of objectives set forth by the "Law on Pedigree Animal Breeding" have not been fulfilled, including conservation and rational use of pedigree resources (Noble, 2015). Additional constraints include lack of awareness of the importance of artificial insemination (AI), and insufficient number of AI units and a lack of qualified veterinary specialists for reproductive biotechnologies (such as artificial insemination or embryo transfer) and their low motivation to carry out this type of work.

The recommended policy actions include: reinforcing genetic improvement; revisiting the "Law on Pedigree Animal Breeding"; encouraging public-private partnership; developing breed standards; initiating herd/flock books for existing local breeds; establishing an identification, registration and performance testing system for purebred animals; ensuring adequate animal health and hygiene expertise and infrastructure; establishing livestock breeder's associations and societies (Noble, 2015).

### **Meat production in Uzbekistan**

The main sources of meat in Uzbekistan are from cattle, sheep and goats, chicken, horse and fish. Most of the red meat production comes from cattle, while the main producers of red meat are the smallholders (*dehkan*) farms, which produce 94% of domestic meat. Since 1991 Uzbekistan has practiced restriction on meat exports in an effort to guarantee self-sufficiency, hence meat produced from beef cattle was strictly for domestic consumption (Noble, 2015). In early 2017, the Government lifted all export restrictions for meat products and now Uzbek producers can export their meat produce based on regional market demand and supply. However, the country imports beef to meet domestic demand. Currently the red meat industry is constrained by the low genetic potential of existing stock; inadequate marketing system including overdue payments, low prices and transportation problems; inadequate infrastructure for veterinary services, inadequate feed resources, weak livestock farmers' organizations and inadequate technical support services. The essential required policy actions include provision of cost effective and relevant AI technologies, improving marketing infrastructure, strengthening the livestock market price and related information, promoting public-private partnership for infrastructure investments and reinforcing the extension services and farmer organizations (Zorya et al., 2019).

### **Dairy production in Uzbekistan**

The dairy sector is the major livestock sub sector in Uzbekistan, contributing about 45% to livestock GDP in 2016<sup>4</sup> The small family producers, *dehkan* farms, sustain the dairy sector. About 95% of the milk produced during the period 2016-2019 was produced in the smallholder *dehkan* farms. However, milk production in Uzbekistan operates well below its potential and has not improved much since 1991. Average milk yields for local breeds rarely exceed 7 kg per day and 1,200 kg per lactation (Siegmund-Schultze et al., 2013). Even cows of European or North American highly productive breeds produce no more than 25 (instead of 35-40) litres of milk/day due to lack of knowledge and skills of breeders <sup>8</sup>. The principal constraints to dairy sub-sector development include the limited *dehkan* farmer access to land; lack of access to sufficient fresh and conserved forage and the unreliable quality of forage and feed; limited access to reliable, quality animal health services; low genetic merit of much of the national herd; inadequate sanitary conditions at farms and processing plants; constrained direct access to processors and markets; and lack of asset building resources including training/advisory services, accessible financing and business capacity to increase sectoral and microenterprise productivity and efficiency (IFAD, 2015).

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<sup>8</sup> <https://www.uzdaily.uz/en/post/53019>



The appropriate policy response will consist of improving the capacity and quality of the AI service delivery through capacity building programmes and public-private partnerships; strengthen cooperatives; strengthen milk inspection; improve marketing infrastructure; improve farmers' linkage to existing and emerging markets and provide land for household level improved grass and leguminous feed production (Zorya et al., 2019).

### **Extension services**

The responsibility of rural extension services is to transmit necessary knowledge to farmers and thus enable them to increase production levels, improve farm management, and achieve higher profitability. Currently the agricultural production support organizations can scarcely fill the knowledge gap of farmers and there is a lack of links to research organizations and communication modus. Many non-governmental organizations involved in extension and training of farmers in the country do not target animal production but rather are mostly active in the areas of farm management, crop production, horticulture, drying of fruits and vegetables, bee-keeping, wheat, etc. Most services are usually discontinued after the completion of the period of donor funding (Lerman, 2007). Additional constraints include low allocation of public or private funding to extension services, low private sector involvement and low capacity of extension agents (Lerman, 2007).

In order to improve the livestock extension delivery system, the services should be user-oriented, cost-effective and demand-driven. Public-private partnership in extension service delivery is crucial. In addition, sufficient expertise in both the quantity and quality of dissemination, research-training- extension-farmer linkage and adequate infrastructure and facilities are important for efficient livestock extension service delivery (Zorya et al., 2019).

## **Veterinary Services in Uzbekistan**

In Uzbekistan, the veterinary service is considered the most developed sub-sector supporting livestock because of its capillary diffusion in regional and district branches and set of services provided. At the district and village levels, veterinary services are provided by public and private Zoo-Vet stations (ZVS). Public ZVSs provide animal vaccination, treatment and AI services to farmers while private ZVSs mostly deal with general animal health issues and, upon agreement with the state veterinary services, also provide animal vaccination and AI. The State Programme for Livestock Development envisages continuous establishment of both public and private ZVSs (Yusupov et al. 2010). However, inadequate buildings and equipment as well as insufficient contribution from the state budget to support services of remote veterinary stations hamper the establishment of more ZVSs. Additional constraints include a lack of the necessary veterinary drugs and their high cost.

The main approaches to the promotion of more effective and viable (public and private) veterinary services requires the creation of an enabling environment to encourage the private sector. This could be achieved through provision of incentive packages such as access to better technologies and training; improving the budget allocation to facilitate provision of essential public animal health infrastructure; strengthening the capacity of ZVSs and establishing a reporting system such as an Animal Identification Database which would facilitate the collection of information on veterinary drugs/vaccine performance at all levels (Yusupov et al. 2010).

### **The training of Veterinarians in Uzbekistan**

Currently there are four main veterinary faculties in Uzbekistan with an average of 400 graduates per year, of which approximately 250 are from the Veterinary Faculty in Samarkand and approximately 50 each are from the three veterinary branches of the universities of Tashkent, Nukus and Andijan. The Samarkand Agricultural Institute is one of the oldest universities in Uzbekistan, founded in 1929. In 2018, the Samarkand Institute of Veterinary Medicine (SIVM) was established within the Samarkand Agricultural Institute<sup>9</sup>. Currently, the SIVM offers four veterinary-related degree courses such as veterinary science, veterinary therapeutics, biotechnology of animals and zoo engineering. Veterinary studies in all faculties last for four years leading to a Veterinary Bachelor degree which is recognized as satisfying national requirements for veterinary practice in Uzbekistan. There is wide consensus that this is not sufficient to comply with

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<sup>9</sup> President's decree # 3703, May 8, 2018, "On the Formation of the Samarkand Institute of Veterinary Medicine"



international standards for veterinary education such as a core curriculum as well as “day 1 competencies” as identified by international organizations such as the World Organisation for Animal Health<sup>10</sup> (OIE) or the European Association of Establishments of Veterinary Education<sup>11</sup> (EAEVE). Equipment, instruments and facilities used by Veterinary Services, particularly for clinical training, are also insufficient to meet the standards. Despite strong recommendations by the (first) 2017 OIE Performance of Veterinary Services evaluation mission regarding this problem, the situation has not greatly changed. As the number of animals in Uzbekistan has rapidly increased in recent years, the demand for veterinarians has grown. Currently there are not enough specialists in cattle practice in Uzbekistan, particularly with regard to the provision of specialist reproduction services and foreign veterinarians are frequently invited as consultants by farmers<sup>8</sup>. This is adding pressure on the veterinary faculties to produce more graduates while jeopardising the quality of veterinary studies. This is one of the most critical issues for the future of the veterinary service in the country especially considering that there are 43 vocational colleges in Uzbekistan offering training courses for veterinary para-professionals within a National Qualification Framework: there is the risk of producing an abundance of paraprofessionals who might find themselves providing veterinary care without having veterinarians to work for.

Continuing education (CE) is regulated by the resolution of Cabinet of Ministers. Currently, it is obligatory for all veterinarians to complete a month-long CE training course every five years in order to maintain their license. These CE courses are subject to internal and external control by an appointed certification committee. The State Committee of Livestock and Veterinary Services of Uzbekistan and other interested parties organize other workshops and courses for veterinarians and veterinary para-professionals. However, CE training occurs mostly in traditional disciplines. Many veterinarians do not receive training in topics such as modern veterinary epidemiology/risk assessment, traceability and animal identification, food safety management systems, animal welfare, and small animal medicine for which expertise is not available in the country. The development strategy of the SIVM focuses on veterinary medicine and other animal-related disciplines by enhancing teaching quality and establishing an appropriate infrastructure. However, the adoption of a credit transfer system and the prolongation from four to five years of the veterinary education programme are prerequisites to meet the demand of international standards for veterinarians on the job market. Such innovations are fundamental to increase the quality of education, attract international students and provide better animal care and quality of animal-derived food products. A capacity building of 20 teachers on veterinary medicine, food safety and livestock within the framework of the BUZNet<sup>2</sup> project, plays an important role in enhancing the teaching quality in the four universities.

### **Governmental Incentivisation of the Livestock Sector in Uzbekistan**

The economy of Uzbekistan has demonstrated high and stable average annual growth rates in recent years, largely as a result of deep economic reforms aimed at modernizing production and improving both infrastructure and the overall quality of life. Uzbekistan is currently regarded as belonging to the group of lower-middle income countries (Kim et al., 2018). However, its stable growth has laid the basis for the country to further enhance its competitiveness and achieve a global standard level of economic development. Encouraged by this outstanding growth performance, Uzbek authorities have set an ambitious goal - to join the group of upper-middle income countries by 2030 (Trushin and Carneiro, 2013; Zorya et al., 2020), as spelled out in the national plan for the modernization of agriculture during 2017-2020<sup>9</sup>. This aims at “developing competitive value chains for domestic and export markets; stimulating rural job creation; improving reproduction, multiplication and dissemination of animal forage seeds; reaping economic benefits through improved productivity and targeted land allocation; developing viable, sustainable and climate-resilient farming systems”<sup>12</sup>. In the livestock sector the President’s Resolution highlights the development of livestock value chains, improved provision of private and public veterinary services, enhancing animal feed marketing to increase feed supply, creating elite or demonstration farms with high quality pedigree animals for reproduction (Figure n. 5), boosting animal productivity by carrying out national livestock breeding programmes, and by importing high quality stock of pedigree animals. Scientific programmes to select highly productive families of Uzbekistan adapted Swiss breed cows (Schwitz breed) are underway (Eshonqulovich et al., 2018).

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<sup>10</sup> [www.oie.int](http://www.oie.int)

<sup>11</sup> [www.eaeve.org](http://www.eaeve.org)

<sup>12</sup> President’s Resolution #PP-2460 of December 29, 2015 on “Further Reforming and Developing Agriculture in 2016–2020”



Further cardinal changes of animal husbandry and veterinary training should also be implemented according to the Presidential Decree of March 28, 2019. The main objectives of this document are to ensure a sustainable increase in the number of livestock in the country, strengthening veterinary control and improving the quality of veterinary services, ensuring effective organization of animal health protection as well as food security and protection from epizootic diseases.



**Figure n. 5** – A Dairy Demonstration Farm near Tashkent, Uzbekistan. The establishment of *elite* or *demonstration* farms was envisaged by the National Plans for modernization of agriculture within the framework of the President's Resolution of December 29, 2015, with the intent to develop a network of centres with high value pedigree animals for reproduction purposes.

Within the framework of this document, the State Veterinary Committee will be reorganized into the State Veterinary and Livestock Committee, and be assigned responsibility to implement a unified state policy in this area. All educational (Veterinary Faculties at Samarkand, Tashkent, Nukus and Andijan) and research institutions (the Research Institute of Veterinary and Poultry, the Research Institute of Karakul sheep breeding and desert ecology, and the Research Institute of Fisheries) are to be supervised by the Committee.

The need for the organization of livestock cooperatives has been recently underlined by politicians in order to provide family farms with forage, veterinary services and agricultural technologies. Measures are also being taken to organize AI centres in each region, with the aim of implementing AI on at least 70 percent of cows by the end of the year, and to improve the breed qualities of 60 percent of cattle by 2025. This will require an improved interaction between veterinary services and quarantine, sanitation and epidemiology, thus implementing quality control procedures for the entire chain of livestock production. In 2019, Friday 13th November was declared Livestock Day <sup>7</sup>

## Conclusions

Further modernization of and growth in the livestock sector of Uzbekistan, particularly in the production of meat and milk, would have great social and economic benefits for the nation. Further development of the sector could also transform these products into export-oriented commodities, which would increase the foreign exchange earnings of the country. Since the independence of the country *dehkan* households have greatly benefited from the growth of livestock production, as due to allocation of land for their ownership the main share of livestock is now owned by them. There is a direct correlation between the welfare level of *dehkan* families and the size of land and the number of livestock they own.

Productivity of livestock could be the key for further income gains for families in rural areas. Currently, livestock-keeping activities contribute about 45% of family incomes in the Piedmont areas and more than 50% in the desert and steppe and semi-desert areas, while animal husbandry in the highland areas contributes up to 67% of family income. The well-being of rural families depends not only on the size of the land they can use, and the size of the herd, but also on the quality of their livestock, and access to productivity-enhancing technologies – especially feed (due to severe shortages), and proper veterinary care for animals (Zorya et al., 2019). Removing constraints to modernization in the livestock sector would substantially contribute to national and/or state development goals including poverty reduction, food security, economic growth and even mitigating climate change (Herrero et al, 2014; Shapiro et al, 2015).

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Co-funded by the  
Erasmus+ Programme  
of the European Union



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