1. Poultry and poultry producers in the Samarkand Region

Samarkand Region is located in the Zarafshan Valley, in the center of the Republic of Uzbekistan. Its population is about 3.2 million people, of whom more than 0.4 million live in the city of Samarkand. Poultry production, which is currently mainly oriented to the
production of eggs is one of the developed sectors of the economy of the region. The Regional Government (Khokimiyat) strongly supports the expansion of the production of eggs and chicken, because of its cost-effectiveness and short payback period. As poultry products are rich in protein, the poultry sector is seen as a real contributor to the national food security policy and its development is considered essential for a healthy diet. The sector also provides job opportunities, thereby reducing unemployment. To date the regional production of eggs is more than twice the local consumption. Poultry farmers of Samarkand Region supply eggs to neighboring regions, as well as to the republic's capital, Tashkent.

In this case study, three types of poultry producers are distinguished, based on the three legal forms of agricultural production entities in Uzbekistan, which are also used in all agricultural statistics. These comprise:

(i) **Dehkhan (дехкан) farmers.** These are usually part-time farmers operating household plots of not more than the legal maximum (ranging from 0.35 ha for irrigated land to 1 ha for the steppe). On average they farm 0.17 ha. They produce potatoes, vegetables, fruits, fodder and livestock, including poultry, for home consumption, but many also sell sometimes considerable surpluses to neighbors and on local markets. Dehkhans complement their agricultural revenue with income from wages, non-agricultural businesses and remittances. Although land ownership remains exclusively vested in the State, dehkhan farmers enjoy lifelong possession of their land and can bequeath it to their heirs. They are free to produce what they want and sell to whom they want;

(ii) **Professional farmers (фермерские хозяйства)** who conduct farming as a commercial business, work almost full-time on the farm and earn their income primarily from farming. They operate areas of 10-100 ha (on average 15 ha), of which on average two thirds is for commercial arable field crops, including wheat. They rent land (that was often formerly used by kolhoz, sovkhoz or state farms) from the State on contracts of 30-50 years that also specify the products to be delivered to the state order system. Some professional farmers also produce poultry on a commercial basis next to crops and other livestock;

(iii) **Agricultural enterprises.** These are incorporated and managed as private or public Joint Stock Companies (JSC). They are usually former state farms or cooperatives. The enterprises analyzed in this case study are mostly specialized in poultry. They comprise medium (100-300 thousand eggs per month) and large (up to 500 thousand eggs per month) poultry farms or factories and incubators.

Despite considerable differences in the level of technology used, egg production is a cost-effective activity for all three types of production units.

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3 Production of eggs currently remains the main priority and activity, even though there is some meat production as well. For this reason this Case Study focuses on egg production.


5 In this case study ‘poultry farms’ and ‘poultry factories’ are used as synonyms to refer to specialized agricultural (poultry) enterprises.
As indicated in Figure 1, despite the presence of large specialized poultry enterprises that, together, produce dozens of millions of eggs per year, the main producers of eggs are dehkhan farmers and professional farmers. The dehkhan produce chicken and eggs for home consumption and for sale in the local market. In 2010, in Samarkand Region, 573.9 million eggs were produced by all types of producers. The total amount of birds reached 4.6 million. For 2011, experts estimate that the number of birds will increase by 20%, while egg production will grow by 25%.

As shown in Figure 2a, Samarkand Region distinguishes itself by the considerably higher contribution that professional farmers make to the total regional production of eggs, compared to the share of this type of producer in the total national production. By contrast, dehkhan farmers in Samarkand make a relatively smaller contribution to regional production than such farms do in the national production. The share of agricultural (poultry) enterprises in the Samarkand regional production is not different from the share of this type of producer in the national production. These statistics can be read as an indication that professional farmers in Samarkand Region consider egg production to be a particularly interesting activity.

![Figure 1](image1.png)  
**Figure 1 – Production of eggs in Samarkand Region in 2008-2010, in millions**

![Figure 2a](image2a.png)  
**Figure 2a - Share of different types of producers in national egg production and in Samarkand regional production (2010)**

![Figure 2b](image2b.png)  
**Figure 2b - Number of eggs per chicken produced by different types of producers in Uzbekistan and in Samarkand Region (2010)**
In addition, as shown in Figure 2b, all three types of producers in Samarkand Region produce more eggs per chicken than the national average for their category. This may be partly due to a stronger focus of the poultry sector in Samarkand Region on the production of eggs rather than meat. Nevertheless, the statistical fact that professional farms, and to a lesser extent also dehkhan farms, in Samarkand Region not only produce more eggs per chicken than the national average for these types of producers, but also more than the poultry enterprises in the Samarkand Region, are strong indications that professional farms and dehkhan farms use relatively advanced production techniques and benefit from the poultry innovation system in the region.

The rapid development of poultry is favored by the well-developed organizational structure of the poultry value chain, which brings together all actors. The Regional Government provides the required institutional framework that creates an enabling environment for the development and effective functioning of the poultry sector.

2. The actors in the poultry innovation system, their roles and relationships

Success in boosting poultry production in the Samarkand Region is largely due to the initiatives of key actors in the value chain and innovation system (see Figure 3).

2.1. Actors in the value chain

A special role is played by the “Agalyk-Lohmann-Parranda” agricultural (poultry) enterprise, a joint venture between the German multinational livestock company Lohmann and a privatized former State farm, which in the soviet days had imported the crosses and production technologies developed by the Russian Poultry Research Institute (VNITIP).

Having the status of breeding farm, Agalyk-Lohmann-Parranda imports parents of high reproductive crosses from Germany into the Republic of Uzbekistan and to date produces more than 70% of the incubation eggs and final hybrids supplied to incubators, other large poultry enterprises and professional farms producing eggs and meat for commercial purposes in the Samarkand Region. Poultry enterprises and professional farms can buy both incubation and commercial eggs and chicks. The latter are highly demanded by dehkhan farms for reproduction and backyard production. The poultry enterprises and professional farms sell their products to public organizations that prepare meals, e.g., hospitals and schools, and to other businesses, such as bakeries, confectioners, restaurants, hotels, grocery stores, minimarkets and supermarkets in regional towns and in Tashkent. Dehkhan farms mostly sell their products in local markets or to wholesale buyers at the farm gate.

The poultry enterprises and large poultry farms are organised in the Association of Poultry Producers of Samarkand Region, which represents their interests and facilitates cooperation between actors in the poultry value chain and with other actors of the innovation system. The association is involved in:

- implementing the poultry development program agreed with the Regional Government;

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6 In recent years, Agalyk-Lohmann-Parranda imported about 100,000 breeding chicks from Germany per year.
7 In 2010, Agalyk-Lohmann-Parranda sold some 5.5 million hatching eggs and 3.4 million one-day chicks.
Figure 3 – The relationship between the actors in the poultry value chain and innovation system
securing timely supply of breeding eggs, one-day chicks and feed to producers;
- attracting investment in the poultry sector infrastructure;
- conducting workshops and demonstrations to enhance the efficiency of the poultry sector;
- monitoring the activities of producers in order to propose and facilitate relevant measures, eliminate obstacles and improve production;
- co-producing, sharing and disseminating new knowledge.

2.2. The Regional Government (Khokimiyat) of Samarkand Region

Another key player in the poultry innovation system is the Regional Government (Khokimiyat) of Samarkand Region and its relevant departments. As indicated, it attaches high policy priority of the development of the poultry sector, because of its important contribution to achieving national food security, as well as to the regional economy and employment. In view of this, the Regional Government not only creates an enabling policy, regulatory and legal environment for the development of the sector, but also provides the necessary physical and institutional infrastructure and ensures access to resources.

Perhaps even more importantly, the Regional Government acts as a broker by bringing the different actors in the value chain and innovation system together and facilitates the joint formulation of the annual “Program for the implementation of measures to develop poultry farming in the Samarkand Region” at regional level. This Program results from intensive bilateral and multilateral communication between the various actors in the poultry innovation system to define consumer demand and assess the producers’ needs and the support they require for better farming and improved livelihoods. The Program defines the roles of various government, public and commercial organizations in implementing the comprehensive measures to ensure the necessary conditions for the development of the poultry industry in order to satisfy the consumer needs of Samarkand Region and supply other regions of the country with poultry products. The Program is approved at the governmental level and involves all aspects of the sector: the premises for breeding birds, cages, feed, preventive measures and protection of birds. Thus, the steering role of the Regional Government is an important factor in the efficient and effective functioning of the poultry innovation system and its sustainability.

Regional Government administration units involved in the innovation system are:
- The Department of Agriculture and Water Resources. This is the executive arm of the Regional Government that is responsible for coordinating the implementation of the activities of all actors involved in the poultry sector;
- The Department for Capital Construction, Transport infrastructure, Public Utilities and Public Works, which is responsible for coordinating construction activities and civil works in the poultry sector;
- The Department of Economic Affairs and Social Development, which is responsible for creating an enabling environment for poultry producers, monitoring of socio-economic changes in the poultry sector and providing access to inputs;
- District Khokimiyats and their departments have the same responsibilities and duties as the regional departments mentioned above, but at the lower, district, level.
- The Regional Department of State Property Committee, in collaboration with other departments of the Khokimiyat of Samarkand Region and the Regional Statistical Office, monitors the housing conditions of incubators, the production capacity and the poultry products. It also assesses needs and collects and analyzes statistical data.
2.3. Supporting public and private service providers

A third group of key actors determining the success of innovation in the poultry sector in Samarkand Region are the public and private organisations that provide supporting services to the actors in the value chain.

Institutional support

The Samarkand regional branch of the Republican Charity Fund "Mahalla", a nation-wide NGO, coordinates the activities of the administrations of rural and mahalla communities8, which also form nodal points of the fund “Mahalla”. The latter, supported by the regional and district Khokimiyats and other actors mentioned above, provide various types of institutional assistance to producers, in particular to dehkhan farms. The nodal points are not commercial organizations, but they are key representatives of rural and agricultural households, and responsible for monitoring the timely provision of dehkhan farms engaged in poultry production with eggs, one-day chicks, feed, chicken cages and other inputs. They are implementing the same activities as the District Khokimiyats, but at the lowest, community, level.

The Regional Department of Land Resources and State Cadaster, in collaboration with the Regional Department of State Property Committee and the departments of Khokimiyat of Samarkand Region, allocate plots to specialized poultry enterprises for the cultivation of crops to feed their birds.

R&D and education

The agricultural education system in Samarkand Region has a huge R&D and human resource capacity, which now fully supports the needs of the poultry industry with qualified personnel. There are seven universities and 146 professional colleges, including Samarkand Agricultural Institute and 24 agro-oriented professional colleges in Samarkand Region.

Founded in 1929, Samarkand Agricultural Institute is a major academic institution in Uzbekistan and one of the oldest agricultural institutions in Central Asia. Annually, more than 160 students graduate with a bachelor's degree and 20 with a master's degree in veterinary science. Over 50 students graduate with a bachelor's and 10 with a master's degree in animal science, including poultry, each year. In animal science, from the third academic year, special student groups are formed for specialization in poultry, which involves training in six specialized departments, including the Department of Animal Husbandry and the Poultry Training Center. The teaching staff of the Faculty of "Veterinary Science, Animal Husbandry and Karakul sheep" comprises 80 PhDs. They are involved in teaching students, research work and practical activities in the institute’s poultry farm and the vivarium. They also operate a veterinary clinic attached to the institute's scientific laboratory and a veterinary help desk for producers.

Agalyk-Lohmann-Parranda cooperates with the Samarkand Agricultural Institute for human resource and technology development. Almost 75% of the administrative, scientific, technical and support staff and workers of the joint venture are alumni of Samarkand Agricultural Institute. The cooperation contributes to improving productivity,

8 Mahalla communities, corresponding to a village or neighbourhood, are the lowest level of administration and civil organisation, both in rural and urban areas. Rural communities are confined to rural areas and can comprise more than one Mahalla.
mechanization, nutrition, feed processing, housing and packaging, animal health, and meat and egg processing.

Samarkand Agricultural Institute carries out scientific and research work in poultry farms in the following areas:
- New technologies for growing chicks and young hens;
- New technologies for breeding and fattening of broiler chicken;
- Experiments to improve the housing of the birds;
- Experiments on the development of balanced nutrition and metabolism;
- Development of chemo- and immune prophylaxis and treatment of parasitic diseases of birds (coccidiosis, ascariasis, etc.).

Together with colleagues from the Research Institute of Veterinary Medicine, researchers have been working to improve methods of prevention of infectious diseases of chicken, such as Newcastle disease, infectious bronchitis, Gambero disease, infectious laryngotracheitis, reductions in egg production syndrome, smallpox, etc. Poultry scientists also conduct research to develop effective methods and means for the prevention of associated forms of parasitic and bacterial infections (colibacteriosis, pulloroz-fever, salmonella, etc.).

**Extension and training**

The recommendations and guidelines of Samarkand Agricultural Institute are disseminated among all actors, especially among poultry farms and households, via local communities and the Association of Poultry Producers in Samarkand Region, with support of the Regional Khokimiyat's relevant departments. They conduct in-field training courses and provide information through printed materials, such as technical leaflets, brochures, professional journals, general newspapers and agricultural newspapers. In addition, mobile telephone and internet communication is playing an increasingly dominant role in the generation, transmission, distribution and acceptance of knowledge and information. The four mobile service providers competing in the region offer more and more new services, while the cost of services remains unchanged. Three of these providers also offer mobile internet. Therefore, mobile communication becomes the most affordable, reliable, cheapest and effective tool of communication. Most professional farmers and dehkhan farmers are now using mobile phones and internet and can easily consult experts for advice on specific issues.

"I have more than 200 chicken. Naturally I want to keep abreast of all market news, prices, as well as what types of chicken are more productive, less prone to disease, how to protect birds from disease, how to keep birds. Of course, I have brochures, manuals, advertising sheets, and even journal, but the best way to get information is a mobile phone. With mobile phone I can easily find a veterinarian or zootechnician who would give me any information I need, and, if necessary, they would come to help and explain everything. Or if they have very important information they can easily find me by mobile phone. We all know each other here ...So my best helper in my business is a mobile phone."

Mr. Fazliddin Akhmedov, dehkhan of Kattakurgan District

**Prevention and protection**

The State Veterinary Office of the Samarkand Region and the Samarkand Regional State Inspectorate for Breeding Livestock, with the assistance of other organizations, support the poultry sector by:
- developing poultry breeding activities;
expanding the bank of crosses and hybrids;
- importing the parental forms;
- preventing and providing protection against diseases and viruses;
- disseminating knowledge necessary for proper husbandry and health care.

**Input suppliers**

Feed is produced on farm or purchased from agricultural enterprises processing grain. The latter carry out thorough supervision of the standard requirements for content of feeds. Specialized shops "Mahsus savdo" sell agricultural inputs, including inputs and tools for poultry production, such as vaccines and materials for cages. In these shops, dehkhan farmers and professional farmers also obtain advice on the use of these technologies and other services required.

**Bank loans**

Commercial banks, such as the Microcreditbank, Khalkbank, Kishlokkurilishbank, Ipotekabank, Savdogarbank, Agrobank, National Bank, and Hamkorbank, provide loans to producers for the procurement of one-day chicks, hatching eggs and feed, the purchase or construction of cages, and for financing the construction of specialized shops "Mahsus savdo" in each mahalla.

### 3. Lessons learned and good practices

The specific interest of this Case Study of the poultry innovation system in Samarkand Region is that the system examined effectively combines a strong steering and facilitating role of the Regional Government, with private initiative of actors in a value chain operating in a partly liberalized market economy. A further specific interest of this case is the mutually beneficial relationship between professional farms and dehkhan farms on the one hand and large private poultry enterprises on the other, with a key role for the Agalyk-Lohmann-Parranda breeding enterprise, which imports technology from abroad. This configuration also stimulates the development of an impressive and dense local knowledge infrastructure and attracts a wide range of public and private service providers, which supports the continuous improvement of the poultry sector.

The impression to date is that both foreign suppliers of technology and regional R&D actors are guided by the requirements of the technology rather than by the requirements of the socio-economic and other specific conditions under which the different types of producers are operating and under which the technology has to be applied. The focus is on achieving technical optima. Therefore technology development is biased towards the (technically more favorable) conditions of large enterprises. This bias seems to be compensated by a range of measures to adapt the socio-economic and other conditions of professional farms and dehkhan farms in such a way that they can obtain technically satisfactory results. There does not seem to be a strong orientation toward adapting technology to fit the specific socio-economic and other conditions of professional farms and dehkhan farmers as is attempted in other parts of the world. Nonetheless, this does not withhold smallholders
from benefitting from this development. Further studies are needed to provide more insight into this specificity of the case examined and draw lessons from this that may well also be useful for other parts of the world.

The combination of strong public steering and private sector initiative, as well as the combined participation of smallholders and large industrial poultry enterprises, is perhaps specific for countries with formerly collectivized economies that obtained their independence from the Soviet Union after 1990. While this may confine the practical applicability of good practices based on this Case Study to countries in Central Asia and the Southern Caucasus, and perhaps in Eastern Europe, the Case Study is providing interesting material for a comparative analysis with Case Studies from Central America and West Africa that were, like this Case Study, developed with support of the project “Good Practices for Integration of Agricultural Research for Development into the Wider Development Agenda – Workshops for Decision Makers”. But in addition, the practical applicability of some of the good practices illustrated in this Case Study may well be highly relevant for more established market economies as well, especially those regarding the advantages of a strong role of public agencies as broker and facilitator. There is a growing consensus in the global literature on innovation that even where strong market incentives for multi-actor collaboration in innovation exist, such collaboration often does not happen spontaneously, but requires a strong broker, a role which only the public sector can play.

4. Conclusion

Undoubtedly, the innovation system that boosts poultry production in the Samarkand Region is an example of successful implementation of initiatives. Its success is based on providing an enabling environment for entrepreneurship, the human factor of producers and poultry farmers, producers’ past experiences, and their desire to modernize production, aimed at the needs of the market.

In conclusion, it should be noted that key actors of the innovation system, such as the Joint Venture Agalyk-Lohmann-Parranda not only set the pace of modernization and technical upgrading of production and thus ensure the competitiveness among other producers, but also create a base for further integration of the innovation system components: agricultural education, agricultural research and extension, as well as the introduction and expansion of modern technologies, including a wide range of ICT tools.