

2018

“Agricultural and Food Systems Transformation for Better Food Security and Nutrition in Eurasia” Uzbekistan country study REPORT



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1. Introduction

To improve food security and catalyze agricultural development in the Eurasian Region, The World Bank and the Eurasian Center for Food Security (ECFS) is organizing a series of activities. One of these is a multi-country study on Food Security and Nutrition (FSN) in Eurasian Region which will yield important insights as a basis for a flagship publication on the topic.

The multi-country study includes a series of country studies on food and nutrition security in the following countries: Armenia, Kazakhstan, Kyrgyz Republic, Russian Federation, Tajikistan and Uzbekistan.

The main goal of the country studies is to generate evidence on FSN for use in future policy-making for each of the countries concerned. The general objectives include:

1. to generate evidence to support government policy aimed at the transformation of existing agricultural and food systems to improve national and household incomes, food security, diets and nutrition in a manner compatible with sustainable management of natural resources; and
2. to facilitate policy dialog for the purpose of integrating the evidence generated by the study into the policy debate and decisions.

This report sheds light on latest developments in food and nutrition security aspects in the Republic of Uzbekistan.

2. Country background

2.1 Location and administrative division

Uzbekistan is located in the very centre of Eurasia. With an area of 447,000 square kilometres, Uzbekistan stretches 1,425 kilometres from west to east and 930 kilometres from north to south. It is the only country in the region which has borders with all other Central Asian countries of the Former Soviet Union: Kazakhstan, Kyrgyzstan, Tajikistan and Turkmenistan; another neighbouring country is Afghanistan. As the Caspian Sea is an inland sea with no direct link to the oceans, Uzbekistan is one of only two "doubly landlocked"¹ countries in the world (the other being Liechtenstein).

¹ “double landlocked” countries are countries completely surrounded by other landlocked countries.

Administratively the country is comprised of 12 regions (oblasts) and the Autonomous Republic of Karakalpakstan in the north-west. In turn each region consists of districts. As of 1st January 2018 administrative territory of Uzbekistan embraces 168 districts, 119 cities (republican subordination - 2, regional subordination - 24 and district subordination - 93), 1081 urban settlements, 1468 village citizens councils, 10998 rural settlements (based on data from State Committee of the Republic of Uzbekistan on Statistics).



Figure 1. Geographical map of Uzbekistan

2.2 Demography

Uzbekistan is the most populous of the five Central Asian countries with over 32 million inhabitants as of January 2018. The approx. annual population growth lies in the range of 1.6-1.7%. Gender wise population is almost proportionate with 50.2% of male and 49.8% of female population. More than 30% of the able-bodied population is engaged in agricultural sector, while the rural population comprises about 50% of the total population. The situation in the agrarian sector of the economy thus to a large extend determines the standard of living of a large part of the population, and the prosperity of the whole nation.

Due to climatic and natural conditions (most of the country is located between two deserts Kyzylkum and Karakum), the territory of Uzbekistan is unevenly populated. The average population density stands at 71.5 people per 1 square kilometre. The majority of the population resides in Fergana valley (with population density of 689 people per square kilometre in Andijan), and other agricultural oasis located in the north-western and southern parts of the country.

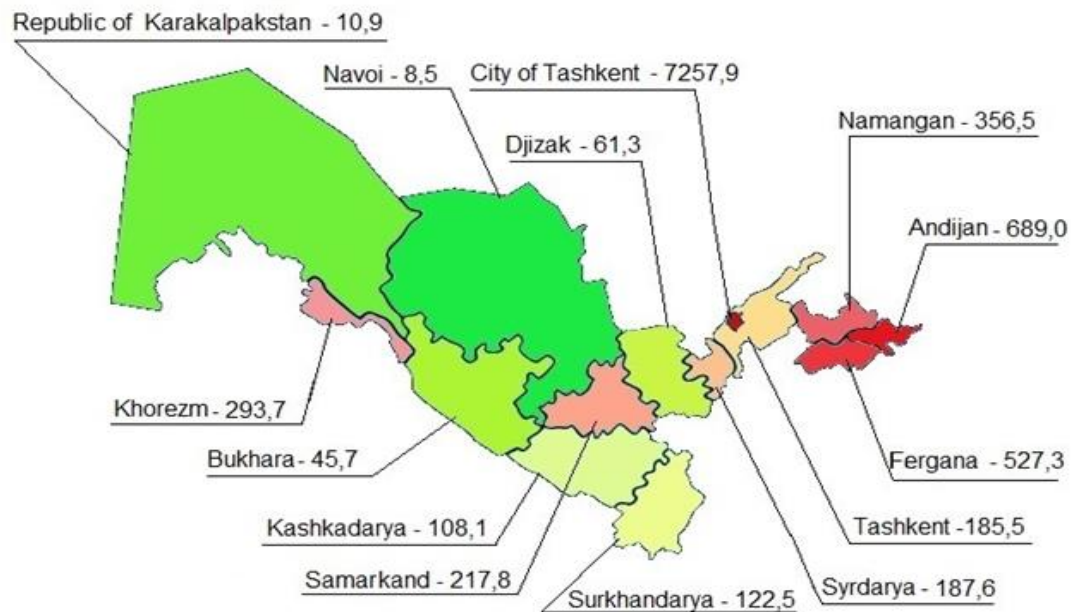


Figure 2. Population density by region of Uzbekistan, 2017

Source: State Committee of the Republic of Uzbekistan on Statistics

One of the indicators of the quality of life is the life expectancy at birth. In the first years of independence, serious reforms began in all areas, including the health sector. In the field of public health the state began to develop and implement a variety of laws, decrees, regulations and programs. As a result of the measures taken, there was a tendency to reduce mortality, including infant and maternal mortality, which in turn affected the increase in life expectancy at birth.

Life expectancy at birth had a tendency to increase in recent years from 66.4 years in 1991 to 73.8 years in 2016 (women - 76.2 years, men - 71.4 years). Due to life expectancy increase, the average age of the population also increased from 23.3 years in 1991 to 28.5 years in 2017.

2.3 Climate

Uzbekistan's climate is classified as continental, with hot summers (up to +50 +60°C) and cool winters (down to -30-40°C). Most of the country is quite arid, with average annual rainfall amounting to between 100 and 200 millimetres and occurring mostly in winter and spring. Aridity of the country dictates high prevalence of evapotranspiration over precipitation. Maximum values of the precipitation are recorded in winter-spring periods. During the rest of the year precipitation is negligible, while evapotranspiration may range between 1,300-2,200 mm per year (Conrad et al. 2012).

Such climatic conditions require only irrigated agricultural production (with little exception in mountainous areas of the country, where some non-irrigated agriculture can be practiced) and cause formation of salinity build-up in the soil profiles in the vast territory of the country.

Saline areas constitute some 47.5 %, which renders them insufficiently low- or even completely non-productive.

Nevertheless, Uzbekistan has the advantages of a warm climate and a long growing season, which allows the production of quite a range of crops under the condition of sufficient irrigation water supply.

2.4 Agriculture

Despite of a low share of cultivated land of below 10%, located mainly in the river valleys of the Amu Darya and the Syr Darya, Uzbekistan is nevertheless considered an agrarian country with an economy depending on agricultural production from irrigated arable land and agriculture based processing industry.

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

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

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

The main types of agricultural producers in Uzbekistan are: (1) private farms, (2) rural households (*dehqons*) engaged in both plant growing and livestock rearing, but basically for own subsistence; (3) few remaining agricultural cooperatives; and (4) agrifirms, or so called clusters, established by certain industrial (agro-processing) businesses for producing and processing certain products.

Private farms

A private farm is a legal entity established for agricultural production purposes, is generally operated by family members and employed seasonal labour during the vegetation season. Private farms lease agricultural land from the state at zero rent with long-term usufruct rights (for a period of up to 50 years). This implies that farmers cannot use their leased land, for instance, as collateral for accessing credit (Djanibekov et al., 2014). In light of the recent 'consolidation' wave, the average private farm size in Uzbekistan will lie in the range of 50-80 ha, depending of the availability of arable land across regions.

Concurrently legislation defines three types of private farms based on their production specialization: (1) cotton and wheat farms (the largest and dominant farm type) that also

produce rice and vegetables on a small share of their farmland, (2) horticultural and gardening farms (specialized in fruits, grapes and vegetables production), and (3) livestock-rearing and poultry farms. The latter two farm types are not part of the state procurement system (Djanibekov et al., 2014).

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

Dehqons

Dehqons are small family facilities with or without a legal status, carrying out small scale agricultural production and its marketing on the basis of personal work of the members of family on the allocated land plot. *Dehqons* can be simply referred to as rural households.

During the former Soviet-era, workers of *kolkhozes* and *sovkhozes*, consisting not only of farm-labours but also of workers having various kinds of jobs, received a small plot to grow crops for self-consumption. After independence the Uzbek agriculture related legislation intended to provide equal access to land by rural households to prevent an increase in the number of rural landless poor and to contribute to an increase in food and cotton production. Beginning in 1991, the state started to take land from former collectives and divide it into additional household plots. Every household received official rights of lifelong inheritable tenure of a plot which is called *tamorka*. *Tamorkas* may be often located within walking distance of a household's village.

According to the land legislation *dehqons* may lease land of the maximum size of 0.12 ha for house buildings/dwellings and additional 0.12 ha for cultivating agricultural crops, which however depends on the availability of 'free' land in the given district or region. Households mainly use land plots as backyard kitchen gardens or a specified area within the main farmland of the farmers, and are free to choose their crops to plant and to sell at their own discretion. Still, *tamorkas* are too small in size to generate profits at a scale that would negate the need to generate additional income via other means.

Agro-industrial clusters

Starting from 2018 a new type of agricultural producers will contribute to the production and processing of foodstuff in the Republic of Uzbekistan, the so called fruit and vegetable clusters. This new structure is supposed to embrace a group of interconnected enterprises/producers independently carrying out the entire cycle from production to the sale of fruit and vegetable processed products.

All land resources in Uzbekistan are the property of the state, which regulates and monitors the land use. Whereas private farmers lease the land from the state for the period of up to 50 years, *dehqons* get the land for life-time inheritable use. According to the Land legislation *dehqons* may lease land of the maximum size of 0.12 ha for house buildings/dwellings and additional 0.12 ha for cultivating agricultural crops, which however depends on the availability of 'free' land in the given district or region. Households mainly use land plots as backyard

kitchen gardens or a specified area within the main farmland of the farmers, and are free to choose their crops and sell at their own discretion.

2.5 Overview of country statistics

According to official statistics of Uzbekistan, GDP of Uzbekistan in 2017 amounted to 249136 billion UZS in current prices (or about 30.7 bln USD) and grew by 5.3% compared to 2016. In 2017 GDP per capita amounted to 7692 thousand UZS (or about 950 USD per year per capita).

Gross value added (GVA) created by all sectors of the economy accounted for 89.8% of the total GDP and grew by 5.3%. Net taxes on products accounted for 10.2% of GDP and demonstrated a similar increase of 5.3%.

Table 1. Main socio-economic indicators of Uzbekistan for 2017

	2017
Total area, thousand ha	44892
Total agricultural area, thousand ha	25621.4
Arable land, thousand ha	3706
Total population, thousand people	32653.9
*rural	63.5%
*urban	36.5%
GDP at constant prices, bln UZS**	249136
GDP per capita, thousand UZS	7692
GVA total, bln UZS	223829.8
GVA from agriculture, bln UZS	43149.8
GVA from industry and construction, bln UZS	74876.1
GVA from services, bln UZS	105803.9
GDP annual growth rate, %	5.3
Unemployment rate, %	5.8
Inflation rate, %	14.4
Export value, mln USD	13893.6
foodstuff, mln USD	875.8 (6.3%)
Import value, mln USD	13013.4
foodstuff, mln USD	1273.9 (9.8%)

*based on national statistics rural population stands at 49.4%; urban – 50.6%

**Currency exchange rate in December 2017 was around 8100 UZS per USD

Sources: FAO, *Tradestatistics.com*/World Bank, State Committee of the Republic of Uzbekistan on Statistics

3. FSN Value Chain framework

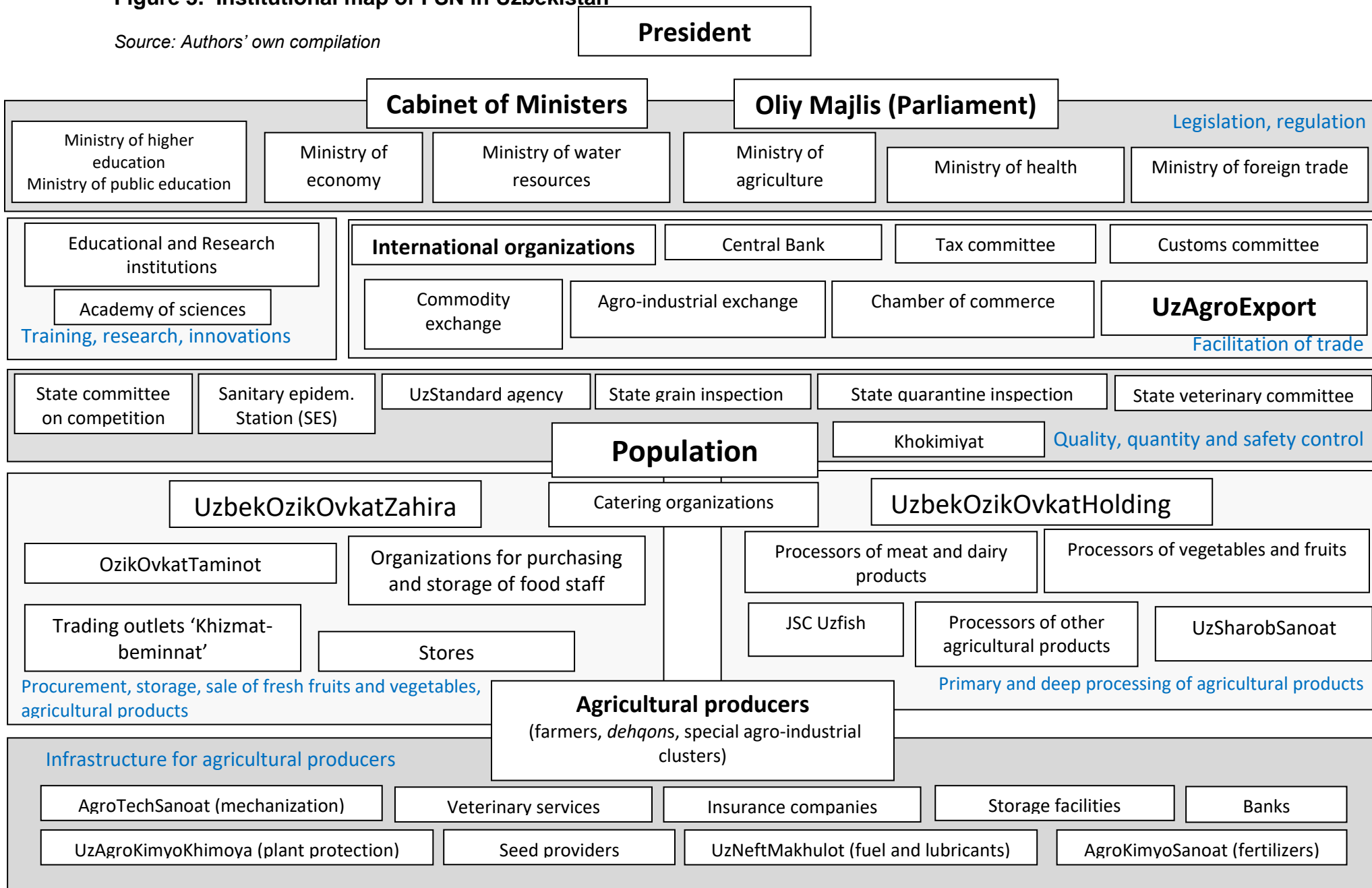
Value chain framework was applied in the current study step-wise and included: (1) institutional analysis aimed at capturing of the flows and identification of the main stakeholders in the existing productive system, analysis of the locations for decisions and collaboration amongst stakeholders; (2) functional analysis aimed at capturing the principal functions in the food chains, i.e. the stages of primary production, processing and transport, as well as any activities associated with the supply of inputs which have been included as part of the chain.

3.1 Institutional FSN map

Application of the value chain framework allowed identification of stakeholders involved in FSN in Uzbekistan with corresponding functions, responsibilities and connections (or hierarchy of subordination). Figure 3 below depicts an institutional map of FSN. Numerous stakeholders have been revealed and grouped according to the role/functions they perform with regards to FSN in Uzbekistan. At the bottom of the scheme are **service providing organizations** to the main **agricultural producers** – private farmers, rural households (*dehqons*) and agro-industrial clusters (Figure 3).

Figure 3. Institutional map of FSN in Uzbekistan

Source: Authors' own compilation



Closely and directly linked to agricultural producers are **organizations procuring, trading, storing and distributing fresh fruits and vegetables** and other agricultural products (livestock products) from farmers to local consumers. Organization called “UzbekOzikOvkatZahira” performs coordination and management functions here (corresponding functions are presented in Table 2, organizational structure is presented in Annex 3).

At the same level on the scheme come **primary and deep processors** of agricultural products. All structures work in the first place towards saturation of domestic markets with food stuff, i.e. meeting demand of the local population. The key organization here is “UzbekOzikOvkatHolding” (corresponding functions are presented in Table 2, organizational structure is presented in Annex 4).

Certain organizations perform **quality, quantity and safety control; facilitate trade** (including export operations); **regulate, provide legislative base** and finally **conduct research and prepare qualified cadre** to work at any link of the FSN chain.

Training, conducting research and developing innovations in the field of agriculture and FSN are the tasks of various scientific-research institutes, such as Research Institute of Plant Protection; Research Institute of Vegetable Growing, Melon and Potato Growing; Research Institute of Grain; Uzbek Scientific Production Center of Agriculture; Scientific Research Institute of Horticulture, Vine and Vine Facilities named after academician Mahmud Mirzaev; etc.

International agencies present in Uzbekistan and conducting activities in the field of agriculture and FSN are WB, WHO, FAO, WFP, IFPRI, WTO, ISO, FSSI, FSMA (EU); NGOs.

Table 2. The list of selected organizations involved in FSN and corresponding functions

Organization	Functions in the context of FSN
Ministry of Agriculture Ministry of Water Resources http://www.agro.uz/	Implementation of land use policies, allocation of land resources for growing food crops. Carrying out the state policy in the field of selection and seed production, breeding, veterinary medicine, plant quarantine and ensuring the safety of livestock, poultry and fish farming products.
Ministry of Health http://www.minzdrav.uz/	Carries out measures for the prevention of diseases, medical assistance, disability, medical examination; Develops and approves sanitary norms, rules, hygienic standards, implements state sanitary supervision over their compliance as well as methodological guidance over the work of sanitary and epidemiological services, regardless of their departmental subordination.
Ministry of Economy https://mineconomy.uz/ru	Organizes measures on the formation and monitoring of the state order balance for the purchase and use of fruit and vegetable products; Develops proposals for the development of infrastructure for

	<p>harvesting, storage, processing and logistics of fresh fruit and vegetable products; Coordinates work on the development of medium-term and long-term programs for the development of agriculture and its main branches, including crop production, livestock, poultry, fish farming, beekeeping, etc.; Develops programs to deepen the level of processing of the fruit and vegetable, and meat and dairy products, expand the output of ready-made food products, and enhance the export potential of the industry.</p>
<p>Ministry of foreign trade https://www.mft.uz</p>	<p>Realization of complex marketing researches of world markets, assistance in implementing programs to develop the export potential of the Republic of Uzbekistan, developing and implementing practical measures to develop and improve the competitiveness of products with high added value in the Republic of Uzbekistan, taking into account the requirements of foreign markets;</p> <ul style="list-style-type: none"> - the implementation on a systematic basis of the analysis of the range of products produced by business entities, determining the level of its competitiveness in external markets, the formation of appropriate databases; - supporting the export of goods, works and services, promoting the expansion and strengthening of trade cooperation of the Republic of Uzbekistan with foreign countries, providing favorable access to foreign markets for goods, works and services produced in the Republic of Uzbekistan, developing and implementing measures aimed at diversifying sales markets; - carrying out a thorough analysis of the volume and structure of imported goods (works, services) imported, the development of proposals on import substitution and localization of finished products, components and materials based on local raw materials, participation in the development of concepts and programs to improve the quality of domestic products.
<p>State Investment Committee http://www.invest.gov.uz</p>	<p>Coordinates the development and designing of development concepts in the fields of agriculture and food security.</p>
<p>State Committee on Competition https://gkk.uz/ru</p>	<p>Implementation of antitrust policy and development of competition; Analysis of prices and tariffs for goods (works, services) of subjects of natural monopolies and protection of consumers' rights from unreasonable overstating of prices and reduction of the quality of goods (works, services) provided by subjects of natural monopolies; Control the compliance with regulated prices (tariffs) and mark-ups on goods (work, services).</p>
<p>State Veterinary Committee no website</p>	<p>Ensuring the protection of the country's territory from the introduction of contagious animal diseases, the introduction of modern methods of preventing the health and treatment of animals, the production of new species and forms of veterinary medicinal products based on the implementation of the</p>

	achievements of domestic and foreign science; control over the quality and turnover of veterinary medicinal products and feed additives.
<p>State Grain Inspection under the Cabinet of Ministers http://uzddi.uz/?mod=main</p> <p>Note: the inspection will be abolished on August 1, 2018 as per President's Decree #5418 "On Measures of Cardinal Improvement of the System of Public Administration of Agriculture and Water Management", from April 17th 2018.</p>	Control over rational and targeted use of grain and its products; provision of adequate storage facilities of grain and its products; decrease/prevention of wasting of state grain reserves and grain products; determination of quantity and quality of state reserves for grain, legumes, oil-bearing crops; settlement of accounts with grain producing, grain processing, storage facilities.
<p>Republican Center of Sanitary and Epidemiological Surveillance of the Ministry of Health (SES) http://www.minzdrav.uz/en/about/apparat/department.php?ID=20639</p>	is a management authority for coordination and control in the field of providing sanitary – epidemiological welfare of population; it conducts sanitary – epidemiological activities as a mandatory part of its production and social work.
<p>State Plant Quarantine Inspection under the Cabinet of Ministers no website</p>	<p>protection of the republic territory from penetration from foreign countries of quarantine and other dangerous pests, diseases of plants and weeds that can cause significant damage to sectors of the economy;</p> <p>timely identification, organization of localization and elimination of quarantine and other dangerous pests, plant and weed diseases, as well as prevention of their penetration into the regions of the republic where they are absent;</p> <p>the state control over compliance with established rules and the implementation of plant quarantine measures in the production, harvesting, transportation, storage, processing, sale and use of agricultural and other products of plant origin.</p>
<p>"Uzstandard" Agency http://www.standart.uz/ru</p>	<p>Publication, promotion and implementation of national and international standards;</p> <p>Supervision over implementation of standards;</p> <p>Promote international system of units (S.I) and assure unified system of measurements;</p> <p>Assurance of consumer protection</p>
<p>Republican Universal Agro-Industrial exchange http://www.exchange.uz/</p>	<p>Creation of conditions for free exchange trade of goods, material and technical resources and other commodity assets.</p> <p>Organization and holding of exchange, exhibition-fair and auction trades.</p> <p>Satisfaction of the needs of farms, enterprises of the agro-</p>

	industrial complex, enterprises, organizations, business entities and other structures in raw materials, materials, goods and other unsecured commodity assets, as well as in selling their products through a system of transparent and transparent electronic trading.
“UzAgroExport” http://uzagroexport.uz/	Export of fresh and processed fruit and vegetable products.
"UzbekOzikOvkatHolding" https://oziq-ovqat.uz	HC "UzbekOzikOvkatHolding" integrates processing enterprises of the following industries: meat and dairy, fruit and vegetable, oilseed, confectionery, beer and beverage.
JSC “UzSharobSanoat” https://vinsanoat.uz/en/	Implementation of uniform of technical and of technological policy of wine-producing industry; Management and coordination of activity of enterprises producing food alcohol, liqueur-and-vodka and wine products; Implemented of marketing studies of foreign and domestic markets, provision of assistance to enterprises in development of new kinds of products, promotion thereof to foreign markets; Wide attraction of foreign investments in industry, assistance in of establishment of joint enterprises with foreign investments.
Association “UzbekOzikOvkatZahira” http://uzsavdo.uz/ru	accumulation of food products of domestic production, especially fresh fruit and vegetables, grapes and melons and gourds and the organization of their export supplies; purchase from farm and dehkan farms fruit and vegetable products and potatoes, ensure its proper storage and sustainable supply of the population in the winter-spring period; marketing study of the situation on the domestic consumer market, implementation of measures to ensure a reliable and uninterrupted supply of the retail network, especially in rural areas, remote and hard-to-reach settlements, socially important food products; organization of works on development and strengthening of the material and technical base of wholesale organizations, provision of construction, reconstruction and modernization of specialized storage facilities for finished food products and fresh fruit and vegetable products, equipping them with modern warehouse, commercial and refrigeration equipment; coordinating the activities of the wholesale bases that make up the association, and assisting them in establishing and strengthening ties with domestic producers of food products.
OzikOvkatTaminot http://uzsavdo.uz/ru	Regional branches of Association “UzbekOzikOvkatZahira”
Scientific Research Institute of Horticulture, Vine and Vine Facilities named after academician Mahmud Mirzaev	Selection, breeding of new varieties of fruit crops and grapes, introduction into production. Production of seedlings for farms and <i>dehqon</i> entities

Uzbek Scientific Production Center of Agriculture	Coordination of scientific research projects
Higher educational institutions Tashkent Institute of Irrigation and Agricultural Mechanization Engineers - http://tiame.uz/en/ Tashkent State Agrarian University - http://tdau.uz/en/	Training of specialists for agriculture (educational institution), food processing and food safety.

Source: Authors' own compilation

3.2 Commodity flow chart in FSN

The commodity flow chart is usually an easier way to present the sequence of flows, as well as actors within the chain. The flow chart visually highlights the complexity of the interactions and flows between stakeholders.

Larger agricultural producers (private farmers) can sell their output at local markets, stores, to catering organizations or to district branches of “UzbekOzikOvkatZahira” through special trading outlets, located at local markets. Furthermore, farmers and newly established agro-industrial clusters sell agricultural output to processing companies; can even export their produce at limited volumes (up to 20 thousand USD) directly to foreign consumers or export through “UzAgroExport” company.

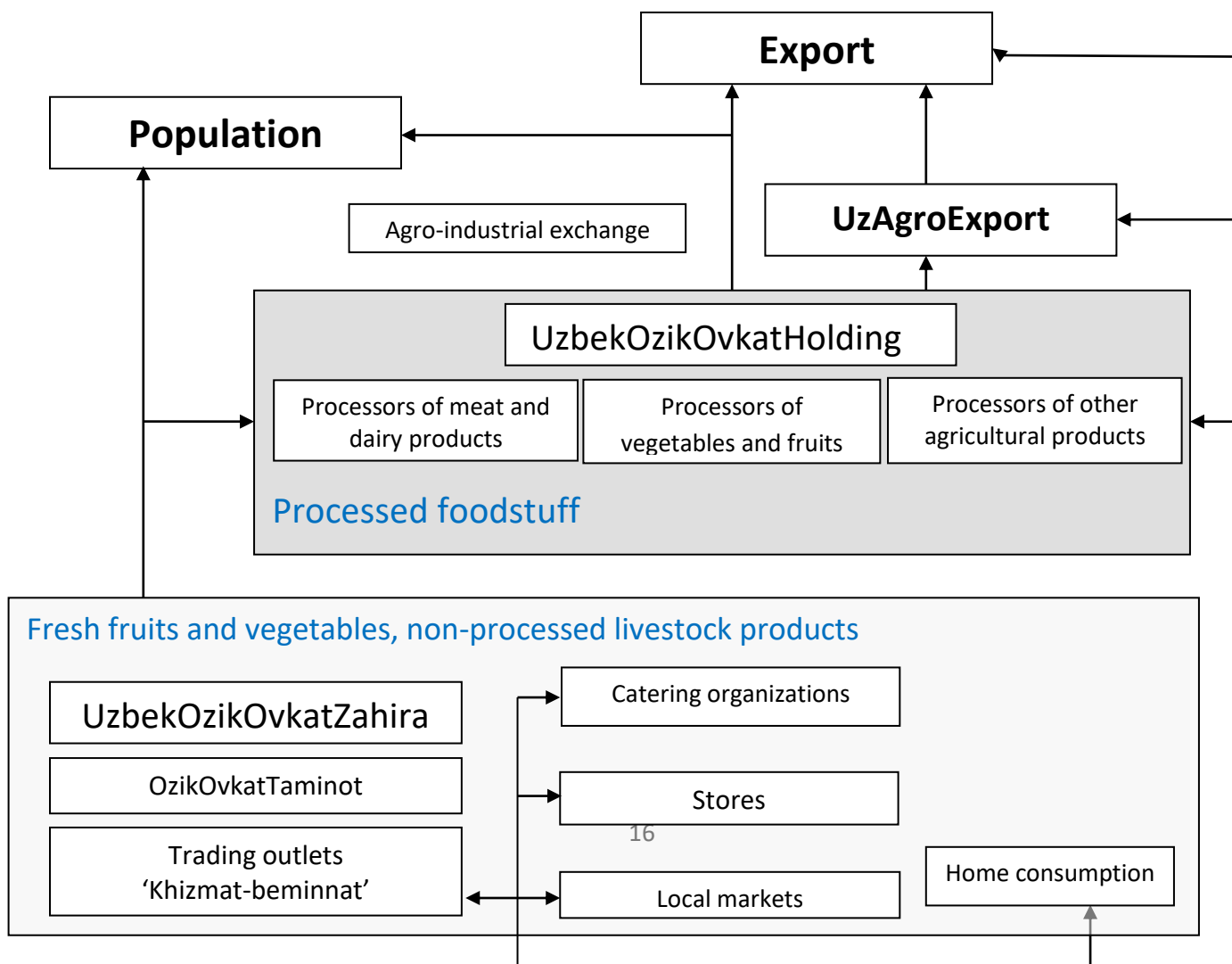


Figure 4. FSN Commodity flow chart in Uzbekistan

Source: Authors' own compilation

The general 'food security' habit of the population and the more so of the rural population (due to the availability of storage facilities compared to urban population living in apartments) is to prepare/store sufficient amounts of the main food items (wheat, potato, other vegetables, fruits, processed/canned/dried fruits and vegetables, flour) for the winter-spring seasons. The underlying reasons are price fluctuations – price increase for many products during winter and early spring, the lack of good quality products in winter at the market place and the reluctance of family members to go to markets during the cold winter days. Thus, small scale agricultural producers (*dehqons*) produce fruits, vegetables and livestock products mainly for home consumption (subsistence agricultural production) or trade their output at local markets.

Processed agricultural products are either sold at local markets (eventually for local population) or can be exported also through "UzAgroExport" company. With the increase in fruits and vegetables' output it was important to develop processing capacities. Plants for processing fruits and vegetables were set up throughout the country with various forms of ownership, including joint ventures with foreign direct investments. The development of the food processing (agro-processing) sector aims at increasing the processing of fruits and vegetables abundant in the country with concurrent improvement of quality of the products; compliance of locally processed fruits and vegetables to international standards; and subsequent export expansion.

3.3 Key institutions managing and coordinating FSN

According to the respondents of the stakeholder workshop, held in Tashkent in March 2018, Ministry of agriculture plays **key role in ensuring food security** in Uzbekistan, whereas the Cabinet of Ministries (and thus respective ministries) has been recognized by the workshop participants as the main **managing structure** in FSN in Uzbekistan.

Further research in the framework of the FSN country study revealed the following organizations responsible for managing and putting in effect policies in 'own' fields of food and nutrition security in Uzbekistan:

- *Ministry of Agriculture*: coordinates policy in land use and crop production;
- *Ministry of Health*: responsible for policy in healthy nutrition;
- *Ministry of Economy*: determines national balance of foodstuffs production;
- *Agency "Uzstandart"*: elaborates general technical regulations for food processors/producers, supervises implementation of standards and issues certificates on food products;
- *Holding company HC «UzbekOzikOvkatHolding»* – incorporates all enterprises in food processing sector and directly controls the quantity and quality of production of foodstuff.

4. Transformation of the Agri-Food System

Agricultural production in Uzbekistan has undergone considerable changes throughout the independence years with the objectives of increasing the efficiency of agricultural

producers, efficiency of natural resource (land and water) use as well as improving performance of the ministries.

4.1 Agricultural transformation until 2017

After gaining independence in 1991, the farm types and the structure of agricultural production in Uzbekistan were modified through the land reform and were geared towards market-orientation (Lerman, 2008). Farm restructuring was a step-wise process with several (five) critical phases (Djanibekov et. al., 2012; Djanibekov et.al., 2014), namely: (i) decollectivization of state farms into collective units and later (ii) into agricultural shareholding cooperatives, (iii) partial and continued disaggregation of large farms into smaller individual (private) farms, (iv) consolidation of small farms into larger ones, (v) fragmentation of large farms into medium-sized farms. Each phase was characterized by a different speed and level of regulations accompanying the transfer of state and collective property to private ownership (Table 3).

The gradual farm restructuring process in Uzbekistan started with the liquidation of *sovkhozes*, transformation of *kolkhozes* into *shirkats*. The institutional changes that constituted farm restructuring in Uzbekistan were mainly the transfer of land to individuals, which led to the establishment of a new form of farm enterprises. These new private farms remained state dependent on inputs such as fuel and fertilizer and, most importantly, water, and had to meet state-determined production quotas (Djanibekov N., et.al. 2012).

Table 3. Phases of farm restructuring in Uzbekistan in 1991-2017

	First stage	Second stage	Third stage	Fourth stage	Fifth stage
Period	1991-1997	1998-2002	2003-2007	2008-20010	2011-present
General objective of farm restructuring	Decollectivization of state owned farms	Partial disbandment of large-scale farms	Complete disbandment of large-scale farms	Farm consolidation	Farm fragmentation
Main transformation process	Transformation of <i>sovkhozes</i> into <i>kolkhozes</i>	Transformation of <i>kolkhozes</i> into <i>shirkats</i> . Partly land leased from <i>shirkats</i> to private farms	Complete transformation of <i>shirkats</i> into private farms	a. Amalgamation of small farms into medium-sized farms b. Amalgamation of medium-sized farms	Creation of medium-sized farms
Dominant farm types	<i>Kolkhozes</i> , <i>sovkhozes</i>	<i>Shirkats</i> , private farms	<i>Shirkats</i> , private farms	Private farms	Private farms
Land	State	State ownership and land lease			

ownership	ownership	
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Source: Updated from Djanibekov et.al., 2014

The farm restructuring process in general only affected large farms (*sovkhoses* and *kolkhozes*), through reallocation of the land leased from the state to the newly evolving private farms. Rural households (*dehqon* farms) were not part of the farm restructuring process, and their land share increased only as a result of the regional population growth.

Since total cropland in Uzbekistan is fixed, the change in the number of private farms was achieved through a change in size and number of production units (Figure 5).

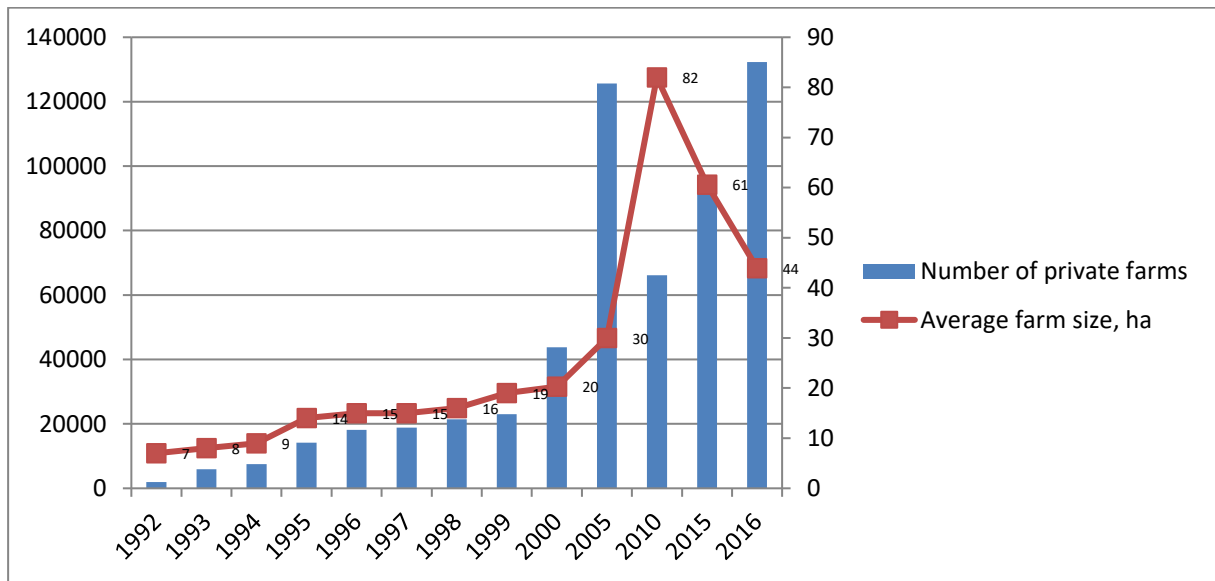


Figure 5. Evolution of the number and average size of private farms in Uzbekistan in 1992-2016

Source: Updated from: Spoor and Visser 2001; Djanibekov et.al.,2008; State Committee of the Republic of Uzbekistan on Statistics

At the end of 2008, farm sizes were optimized through a process of confiscating and merging farmlands into larger farm units. The main drawback of the approach of producer downsizing was that the infrastructure previously maintained by and serving only a few large farms has deteriorated and was not adjusted to serve the many newly emerged land-leasing farms. Hence, the observed return in 2008 to the previous production structure where land is concentrated in a smaller number of larger crop-growing farms seemed viable under the current infrastructure setup. Other reasons for farm consolidation were the following: state agricultural production procurement organizations (wheat mills, cotton refining plants) had to arrange contractual agreements with numerous private farms, which became cumbersome and required more financial and time resources; small and medium-sized farms could not really improve their economic performance and a more efficient resource use. By 2010 and in accordance with the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan of March 16, 2010, No. 47 "On Results of Optimizing the Size of Land Plots in Farm Enterprises" 66.1 thousand private farms were established throughout Uzbekistan.

Starting from 2011 the process of farm optimization was reversed and large farms have gone through fragmentation once more. In a five year period (by the end of 2016) the number of operating private farms reached 132 thousand units with an average size of around 44 hectares (Figure 5).

Furthermore, in 2017 the Ministry of agriculture and water resources went through reformation; though state order for cotton and wheat is still in place, area under state order crops has been reduced in favour of vegetables, potato, fodder crops and orchards; agro-industrial clusters have been established in order to foster processing of agricultural products into food stuff of sufficient variety, quality and quantity.

4.2 The current agricultural development strategy envisioned by the government ^[17] _{SEP}

The current priorities for agricultural development are geared towards full utilization of available land resources and promotion of new income sources for agricultural producers – private farms and *dehqons*.

The Government has always been tightly regulating the agricultural sector, but before 2017 that concerned usually farmers. Lately, the Government adopted two legal acts that concern and impact not only farms, but also *dehqons* and rural households with agricultural land plots². The priority here is twofold:

1. *Support and enforce the efficient use of agricultural land by farms, dehqons and rural households.*

The government has found that there were 480,000 hectares of household plots used inefficiently in 2017. Also, no measures were taken to radically change the attitude of landowners who have not used their land for many years. So, in order to support agricultural producers, ensuring the effective use of cultivated areas of farms, *dehqons* and households the Government has proposed the following measures:

- Ensure financial and economic sustainability of farms, *dehqons* and household landowners, the introduction of modern market mechanisms into production, processing, supplying and providing services in agriculture.
- Local regional parliament will monitor on a quarterly basis how efficiently farms do use their lands;
- Local self-government bodies (*mahalla*) will monitor on a monthly basis how efficiently *dehqons* and rural households do use their land plots;
- Strict liability measures, up to the termination of their rights to land plots, will be applied to farms, *dehqons* and rural households that inefficiently use their land plots, have not fully sown agricultural crops, do not implement timely agro-technical measures.

² President's Decree #5199 «On Measures for Core Improvement of the System of Protection of Rights and Legal Interests of Farmers, Dekhkan Farms and Owners of Household Land, Effective Use of Agricultural Land», October 9th, 2017.

The Cabinet of Ministers' Resolution #25 "On Measures to Facilitate Further Efficient Use of Lands and Additional Income of Farms", January 14th, 2018

- At the same time, the Government has declared the creation of effective system for protection of the rights and legitimate interests of farms, *dehqons* and household landowners.

2. *Gradual transformation of farms into multi-specialized farm entities in 2018-2021.*

The Government stresses that farms should not only cultivate crops, but also develop other kinds of production, such as processing of own agricultural goods. For example, livestock farms should develop the production of meat and milk products. Cotton and wheat specialized farms are supposed to build greenhouses, develop livestock and poultry breeding on their spare land. This is a mandatory process that farms must accept. Otherwise, starting from January 1 of 2022, land lease agreements with farms, which haven't developed multi-profile business activities, will be terminated in accordance with the legislation.

Here we see that the state policy in agriculture gets more enforcing and mandatory for agricultural producers of all kinds. However, the Government promises to enhance the protection of the rights of farms, *dehqons* and rural households.

In addition, the interviewed experts agreed that in the last 2-3 years the national strategy for the development of agriculture has also been aimed at the:

- Expansion of the volume of agricultural production via efficient use of agricultural land, "intensification" of production and crop diversification.
- Increase of the export potential of agriculture by encouraging the export of fresh and processed agricultural products (vegetables, fruits, melons, etc.).
- Development of organic agriculture and of adaptive technologies in agriculture under the conditions of climate change.
- Given the continuing demographic growth of the population in Uzbekistan, in recent years the government has boosted its actions to increase the production of food products. Cotton has almost lost its status of the main strategic crop and the process of its replacement with food crops (fruits, vegetables, melons, etc.) continues. For instance, in 2017 it was decided to replace cotton on lands with low yields with pepper in the Republic of Karakalpakstan.
- To further streamline the process of food policy, the system of the state order for the purchase of fresh fruit and vegetable products was introduced in 2016, which provides basis for the storage of fresh fruits and vegetables, the steady saturation of the domestic consumer market in the winter-spring period. It is a significant change, since before only cotton and wheat crops were under state order regulation.
- The Government has also decided to focus on the enhancement of the feed base for livestock and fish farming. Currently, more than 6 thousand livestock and 3 thousand fish farms are operating in the country, and, according to estimates, it was expected to produce 2319 thousand tons of meat, 60 thousand tons of fish in artificial reservoirs last year (2017).
- However, insufficient attention has been paid to the development of the fodder base for livestock and fish farming. Due to disruptions in providing livestock, fish farms and

organizations with high-quality fodder, the growth rates of livestock and fish production remain low.

- In order to strengthen the fodder base of industries on a systematic basis, to ensure stable supply of livestock, fish farms and organizations with high-quality fodder, the Government established the procedure according to which, starting from the harvest of 2017, the sale of wheat, allocated from state resources for feed purposes, will be carried out by the livestock and fish breeding business entities at the exchange auctions, conducted by JSC "Uzbek Republican Commodity and Raw Materials Exchange"³.

The government of Uzbekistan aims to take more steps to increase agriculture production. Measures include (i) further structural reforms in agriculture and diversification of agricultural production; (ii) mechanization of agriculture, improvement of infrastructure, and development of agribusiness; (iii) more productive use of land and water; (iv) greater financial stability of farm entities; and (v) more market-oriented agricultural policies. The government's sector development plan up to 2020 includes further reductions in cotton and wheat production and an increase in horticulture production. The strategy for further land reallocation will result in the following production area increases: 36,000 ha for potatoes, 91,000 ha for vegetables, 18,000 ha for fruit orchards, and 11,200 ha for vineyards. The strategy will also aim at improving logistics and processing to boost exports of agricultural products, including horticulture with the support of the Program on measures to further develop the raw material base; expand the processing of horticulture, meat, and dairy products; and increase production and export of foodstuffs during 2016–2020.

4.3 Transformation at ministerial level

In February the Ministry of agriculture was split into two legally separate ministries: one being responsible for agriculture management, and the other – for water resources management.

In order to establish effective work on strategic planning of agricultural policy, food security and water consumption, the main tasks and activities of the new Ministry of agriculture, related to food security, were defined as follows:

- Implementation of a unified policy in the field of agriculture and food security, aimed at a comprehensive modernization of the industry, the introduction of science and technology achievements, modern resource-saving and intensive agricultural technologies, advanced experience in agriculture;
- Coordination of activities of state bodies, economic management bodies and other organizations in the field of ensuring food security in Uzbekistan.

³Cabinet of Ministers' Resolution # 845, "On Measures To Strengthen The Feed Base Of Livestock And Fish Farming", October 18th, 2017.

4.4 Transformation at producer level

Whereas in the past large cooperatives (shirkats) accounted for most agricultural output, at present private farms cultivate majority of wheat while the bulk of other food crops and livestock is produced by small *dehqon* farms.

Furthermore, on March 29th, 2018 with the aim to ensure an accelerated and effective development of fruit and vegetable growing, expand production of high-quality and competitive finished products, and subsequent promotion to major overseas markets, the President has issued a special Decree № УП-5388. The Decree sets the framework for establishing fruit and vegetable clusters throughout the country. This new structure is supposed to include all production stages of fruit/vegetable value chains: production of seeds (seedlings) - growing fruits and vegetables - harvesting - storage - processing - transportation - delivery to the market.

The more so, the newly established fruit and vegetable cluster will be subject to various preferences/support from the government: (1) ensuring guaranteed contracts between producers of agricultural products and enterprises, procurers, processors, exporters, supplying agricultural producers with planting stock, advance resources for the organization of agricultural work and purchasing their manufactured products at negotiated prices; (2) granting fruit and vegetable clusters the right to independently make decisions on the allocation of agricultural crops, determining output volumes, their types and varieties, the use of agro methods, based on soil and climate conditions and demand in the domestic and foreign markets, and subcontracting farmers and *dehqons* to procure their agricultural output; (3) allocation of additional land for promptly make decisions on the allocation of fruit and vegetable clusters of land for the creation of seedling nurseries, as well as logistics centers (refrigerators, storage facilities, processing facilities, infrastructure facilities for laboratories, machine and technical stations); (4) exempt the seedling producing clusters until January 1st, 2021 from all taxes; (5) exempt clusters from customs duties and fees to the Republican Road Fund on imported vehicles for transporting fruits and vegetables; (6) ensuring the access of clusters and other horticultural producers to an electronic database of potential foreign markets (to be established until November 1st, 2018) for the possibility of obtaining information in the context of species, varieties, consumers, as well as for their requirements.

4.5 Changes in agricultural shares in GDP (GVA)

Agriculture plays a highly important role in Uzbekistan's economy. Based on data from State Committee of Uzbekistan on Statistics, in 2017, 49.4% of the population – around 16 million people – resided in rural areas. Agricultural sector, therefore, has a significant impact on rural livelihoods, jobs, and food security; in 2017 it contributed 19.2% to GVA, 15% to export revenues, and over one-third to employment in the country⁴.

⁴ Including cotton production

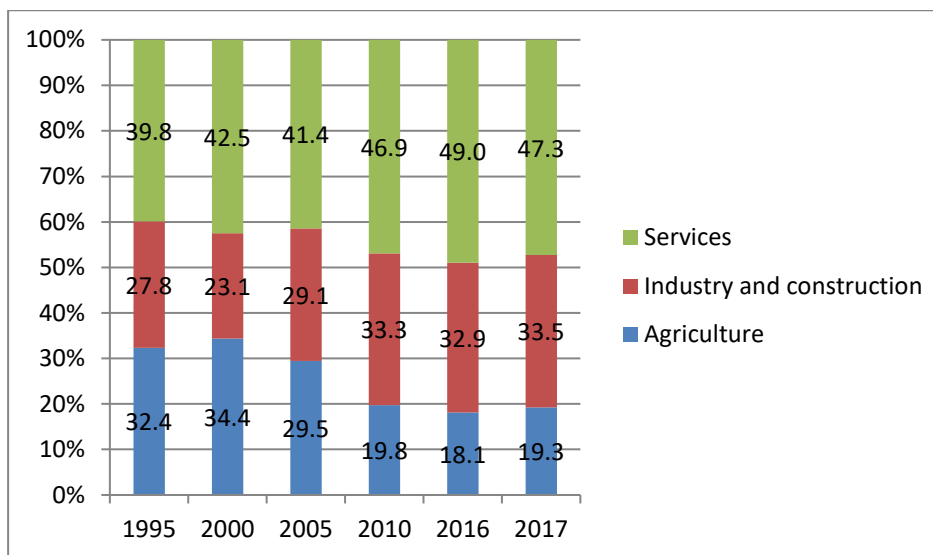


Figure 6. Contribution of sectors of economy to GVA of Uzbekistan

Source: State Committee of the Republic of Uzbekistan on Statistics

Overall, there has been a noticeable and steady decline in agricultural share to total GVA (from 32.4% in 1995 to 34.4% in 2000, to 19.2% in 2017). Over the same period agricultural output rose steadily at annual rates of 6 to 7%, i.e. the declining share of agriculture in GDP was due to higher growth rates in other sectors of economy. The share of agriculture in GDP has risen in 2017 (compared to 2016) to slightly over 19%, basically due to structural changes in agricultural output, i.e. increase in area under fruits, vegetables and fodder at the expense of area under wheat and cotton. On the one hand export of the increased fruits and vegetables output was greatly supported by the state, on the other hand the increased fodder base allowed an expansion in livestock production and output.

Agriculture's contribution to GDP has traditionally derived from the production of cotton and wheat, which the government has regarded as strategic crops and supported through preferential access to land, inputs, and finance. However, there has been a shift in the contribution of these crops to GDP since 2000. The share of cotton production in GDP declined from 3.6% in 2000 to 2.3% in 2016. Over the same period, the contribution of grains to GDP fell from 3.4% to 2.4%, while the combined share of fruit and vegetables increased from 5.2% to 10.6%

4.6 Transformation of agricultural land use

Climatic conditions (with ample amounts of heat and sun shine), arable land and a vast irrigation network in Uzbekistan favour production of a wide variety of fruits and vegetables, grapes, and melons. Horticulture is a significant component of the agricultural sector in the country, although the sub-sector accounts for only about 13% of aggregate crop lands, in contrast to grains (45%) and cotton (37%). But, with a growing domestic and export market, the horticulture sub-sector is steadily increasing, primarily by displacing land under cotton (Figure 7).

The general trend of changes in sown area, or agricultural area optimization process, continued in 2017. In total 3706.7 thousand ha have been planted in 2007. Area under all

main crops increased (grains reached 1689.4 thousand ha, vegetables – 206 thousand ha, fruits and berries – 279.6 thousand ha, whereas area under cotton (industrial crop on Figure 6) decreased.

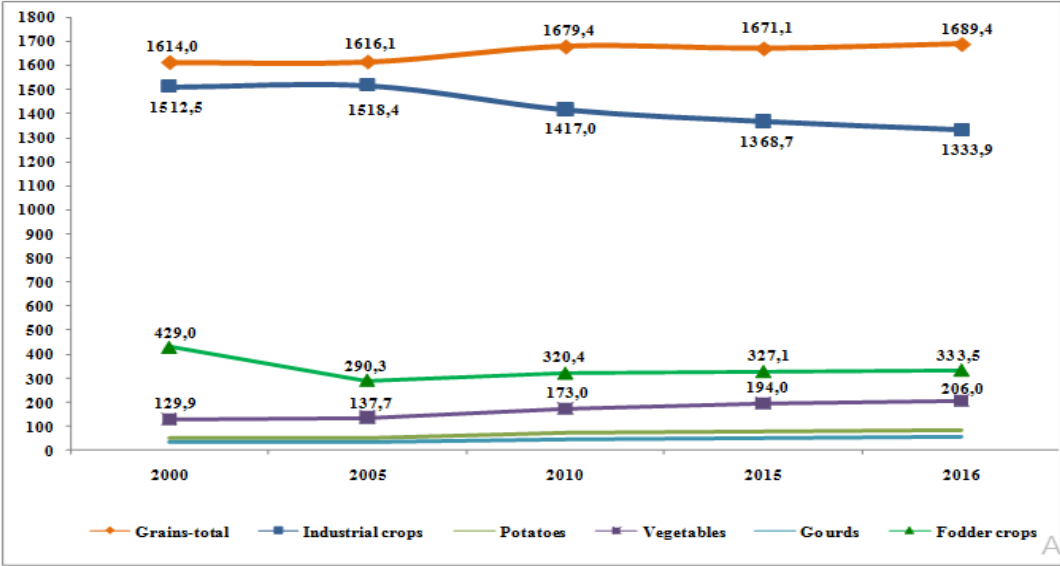


Figure 7. Area under main agricultural crops in 2000-2016, thousand ha

Source: State Committee of the Republic of Uzbekistan on Statistics

4.7 Transformation of agricultural output structure

Crops growing

The tendency of the last years shows that production of fruits and vegetables has been steadily increasing. According to data from “UzbekOzikOvkatHolding”, about 15 million tons of fruits and vegetables are annually produced in Uzbekistan. In the last decade (from 2007 to 2017) production of grains increased 1.2 times; vegetables more than two-fold, of fruits and melons by 2.4-2.5 times (Figure 8). It is envisaged that agricultural output of food products will further increase to 30 million tons by the year 2020.

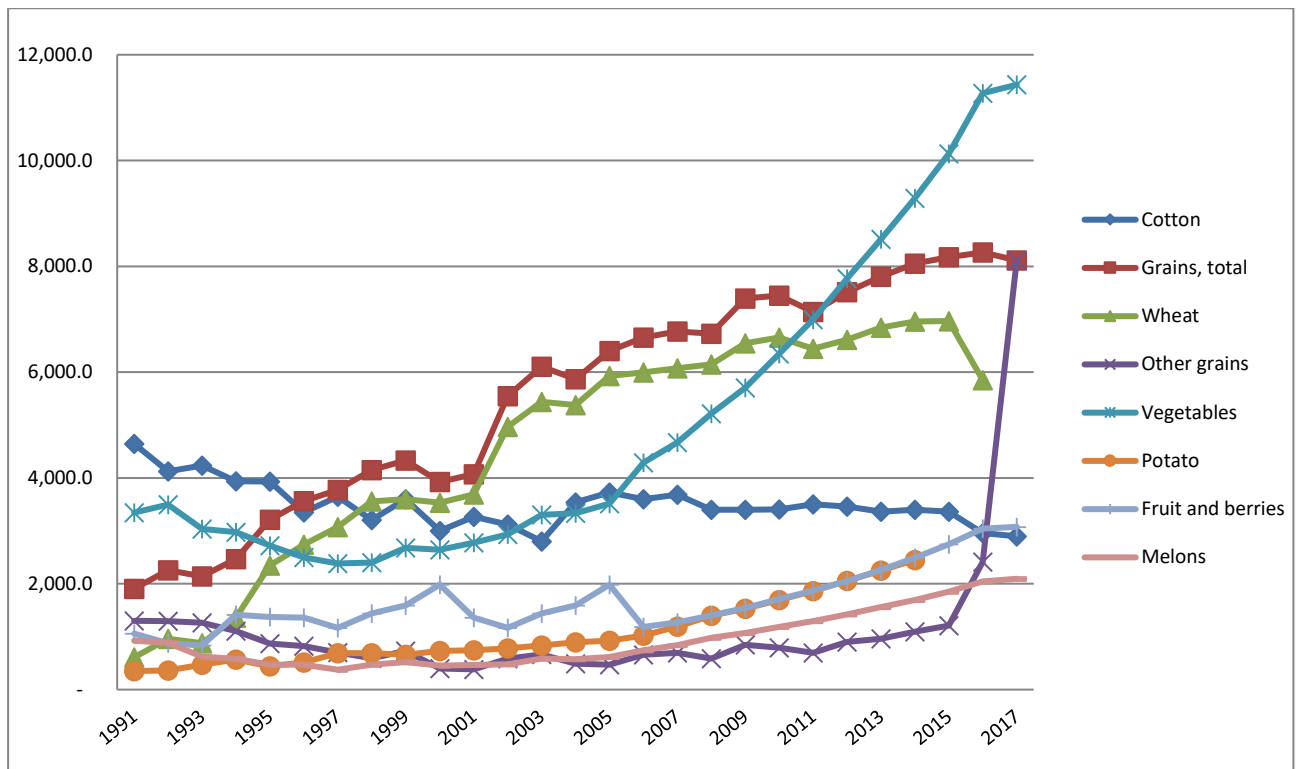


Figure 8. Output of main agricultural crops in 1991-2017, in thousand tons

Source: State Committee of the Republic of Uzbekistan on Statistics

Grain production in Uzbekistan developed dramatically since independence in 1991. Higher yields, as well as the expansion of sown areas, accounted for this increase. Due to the development of wheat production, the wheat import dependency ratio⁵ of Uzbekistan has fallen from 82.2% in 1992 to 4.5% in the beginning of 2000s. Overall, based upon the available statistical data, it can be concluded that Uzbekistan currently produces sufficient quantities of wheat, i.e. 8116.5 thousand tons per year.

Production of livestock products

The development of livestock sector in Uzbekistan is under special attention of the state due to several reasons: livestock products, in supplement to wheat and other grain products, are the pillars of the national food-security policy; livestock is of great social significance as it is an important source of income contributing over 10% (UNDP, 2008) to family budget and vital food products for rural families (Khaydarov, 2015); livestock represents a crucial component of the fixed capital for any rural household and is considered a highly liquid asset, which can easily be sold and converted to cash upon family necessity.

Independence period promoted the ownership of livestock and improved the facilities for agricultural producers by improving rural infrastructure, providing low interest rate loans,

⁵ The cereal imports dependency ratio tells how much of the available domestic food supply of cereals has been imported and how much comes from the country's own production. It is computed as $(\text{cereal imports} - \text{cereal exports}) / (\text{cereal production} + \text{cereal imports} - \text{cereal exports}) * 100$. Given this formula the indicator assumes only values ≤ 100 . Negative values indicate that the country is a net exporter of cereals. Source: FAO
This is calculated as imports divided by [production + imports – exports] and multiplied by 100 %.

allowing special privileges and tax exemptions for the beginners. State support of livestock sector development resulted in over 189% increase in meat production, 198% in milk production and around 300% increase in egg production during in 2017 compared to 2007 (Figure 9).

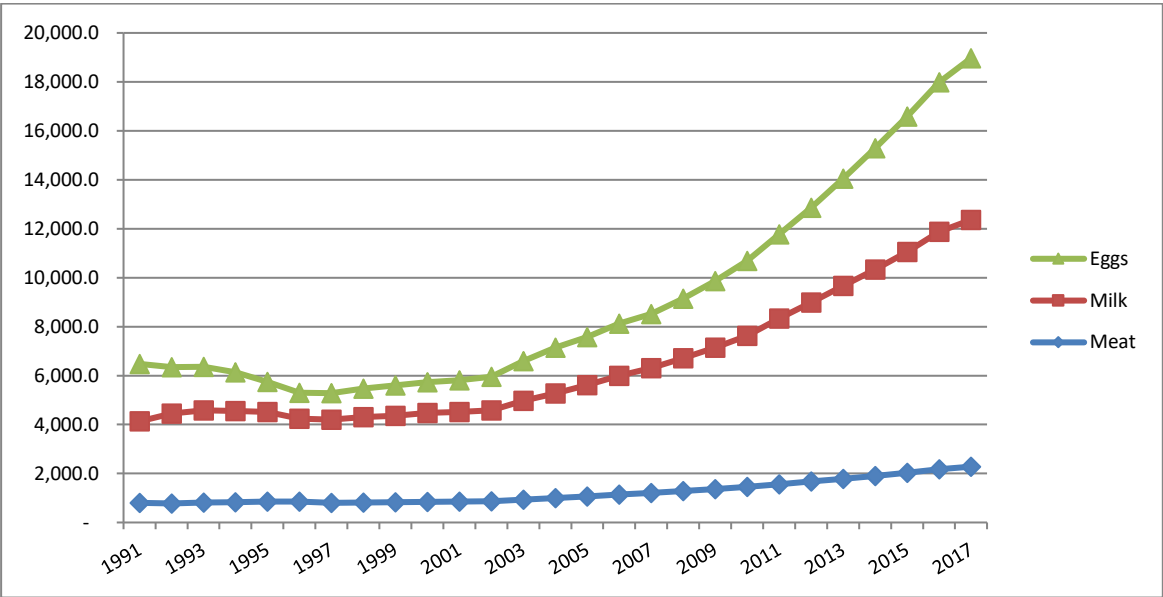


Figure 9. Production of livestock products in 1991-2017, in thousand tons, eggs in mln pieces

Source: State Committee of the Republic of Uzbekistan on Statistics

Consistent implementation of measures to further increase the capacity of the livestock sector, as well as the systemic state support provided, contributed to the growth of livestock numbers, the saturation of the domestic consumer market with livestock products. Total production of meat in 2017 reached 2281.1 thousand tons, of dairy products – 10083.3 thousand tons and of eggs – 6605.5 million pieces.

Agricultural production per capita

Production of all crops has grown in terms of both absolute volumes and in kilograms per capita. Despite of constant demographic growth, Uzbekistan has succeeded in increasing production of the main agricultural products per capita (Figure 10).

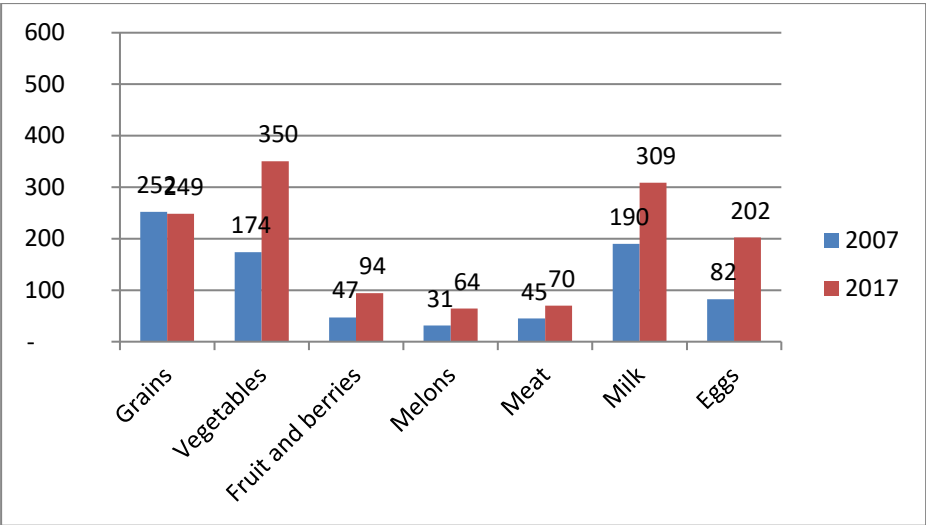


Figure 10. Output of main agricultural crops and livestock products per capita in 2007 and 2017, in kg per capita

Source: State Committee of the Republic of Uzbekistan on Statistics

The implementation of measures during the last decade (from 2007 to 2017) aimed at increasing the level of the provision of the population with agricultural products led to the increase in per capita production of vegetables two-fold (plus 176 kg per capita), fruits and berries also almost two-fold (plus 47 kg per capita), melons over 2 times (plus 33 kg per capita), meat by 1.5 times (plus 25 kg per capita), milk by 1.6 times (plus 119 kg per capita) and eggs by 2.4 times (plus 120 kg per capita) (Figure 10, Table 4).

Table 4. Agricultural output per capita in 2006-2017, kg per capita

	Recom- mended norm*	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Grains (wheat)	128.4	251	252	247	266	261	243	252	258	262	261	259	249
Vegetables	109.2	162	174	191	205	222	238	261	282	302	324	354	350
Fruit and berries	65.9	45	47	51	56	60	64	69	75	81	88	96	94
Melons	19.3	28	31	36	39	41	44	48	52	55	59	64	64
Meat	46.1	43	45	47	49	51	53	56	59	62	65	68	70
Milk	156.3	183	190	199	208	216	231	246	261	274	288	305	309
Eggs	295	80	82	89	98	107	117	130	145	161	177	192	202

*Nutrition norms recommended by the Ministry of Health of Uzbekistan, kg per capita per year; eggs – pieces per capita per year

The data presented above indicates that in the last decade Uzbekistan managed to increase production of the main food items, including crops and livestock products per capita, adequate not only to meet the demand of the growing population, but also to increase export of foodstuff. One exception remains production of eggs, where there is still a deficit of about 90 eggs per capita per year.

Still, the average person's diet and nutrition intake remains heavily biased towards grains. To improve further the availability of meat, milk products and eggs, the government should take measures to stimulate the consolidation of the livestock sector, improve animal productivity, expand the fodder base, and reduce tariff and non-tariff barriers for international trade in livestock products.

Production by different agricultural producers

The analysis showed that the main area under grains and raw cotton remains at the disposal of private farms; under potatoes, vegetables, and melons – of *dehqons*, under fruit and grapes – agricultural enterprises (agri-firms) (Table 5).

Overall in 2017, 63.6% of agricultural output was produced by *dehqons*, 34.7% by private farms and only 1.7% by large-scale agricultural enterprises.

In particular in 2017 *dehqons* remain the main producers of most crops, including 77.9% of potatoes, 66.2% of vegetables, 53.5% of fruits and berries. A significant part of grains was produced by private farms – 80.7% (Table 5).

With regards to livestock production, 94% of the total volume of meat in live weight falls on *dehqons*, as well as 95.6% of milk, and 60.8% of eggs.

Table 5. Shares of agricultural producer types in crop and livestock production, 2000, 2016, 2017, in %

	Private farms			Dehqons			Agricultural enterprises		
	2000	2016	2017	2000	2016	2017	2000	2016	2017
Area under main agricultural crops by type of agricultural producer in 2000-2016, in %									
Grains	15.8	85.4	n.a.	12.1	12.5	n.a.	72.1	2.1	n.a.
Cotton	20.7	99.2	n.a.	–	–	n.a.	79.3	0.8	n.a.
Potatoes	5	21.4	n.a.	78.2	77.7	n.a.	16.8	0.9	n.a.
Vegetables	6.5	36.5	n.a.	66.7	61.9	n.a.	26.8	1.6	n.a.
Melons	17.6	53.9	n.a.	42	44.1	n.a.	40.4	2	n.a.
Fruit	7.1	61.5	n.a.	28.8	30.1	n.a.	64.1	8.4	n.a.
Grapes	5.8	65.1	n.a.	21.9	31.2	n.a.	72.3	3.7	n.a.
Output of main crops by type of agricultural producer in 2000-2016, in %									
Grains	14.4	80.4	80.7	18.6	18.3	17.8	67	1.3	1.5
Cotton	18.3	99.5	99.4	–	–	–	81.7	0.5	0.6
Potatoes	4.2	23.1	21.4	80.1	76.1	77.9	15.7	0.8	0.7
Vegetables	4.9	34.8	33	75	64.3	66.2	20.1	0.9	0.8
Melons	11.2	49.5	47.7	63.5	48.9	50.6	25.3	1.6	1.7
Fruit	4.3	45.8	44.5	58.9	52.1	53.5	36.8	2.1	2
Grapes	4.7	53.1	49.3	33	45.4	49.3	62.3	1.5	1.4
Output of the basic livestock products by type of agricultural producer in 2000-2016									
Meat	1.3	2.9	3.3	91.1	94.4	94	7.6	2.7	2.7
Milk	1.5	3.6	3.6	93.6	95.7	95.6	4.9	0.7	0.8
Eggs	1	10.7	9.8	59.9	57.7	60.8	39.1	31.6	29.4

Source: State Committee of the Republic of Uzbekistan on Statistics

Analyzing the data on the number of cattle by categories of farms, on January 1, 2018, it should be noted that 4.8% of cattle belongs to private farms, 94% to *dehqons*, and 1.2% to organizations engaged in agricultural activities. Furthermore, breeding of 10% of small ruminants falls on private farms, 84.8% on *dehqons*, and 5.2% on organizations engaged in agricultural activities. 11.5% of poultry is kept by private farms, 61.9% by *dehqons*, and 26.6% by organizations engaged in agricultural activities.

4.7 Agricultural employment dynamics

In the period of 1991 to 2017 the population under working age has been declining, the population at working age and over working age has been growing (Figure 11). Thus, total labour force of Uzbekistan stands at 19.5 million people or around 60.5% of the total population of 32.6 million people at the end of 2017.

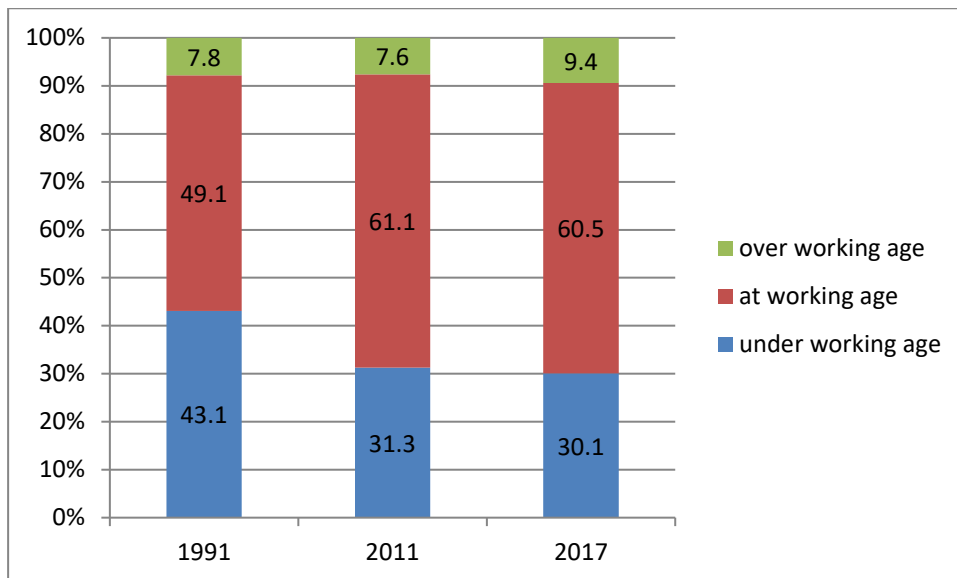


Figure 11. Age composition of resident population of the Republic of Uzbekistan in 2017, in %

Source: State Committee of the Republic of Uzbekistan on Statistics

Employment in agriculture has been also steadily declining in 2000-2017 from over 40% in 2000 to about 21% of the total labour force in 2017 (Figure 12).

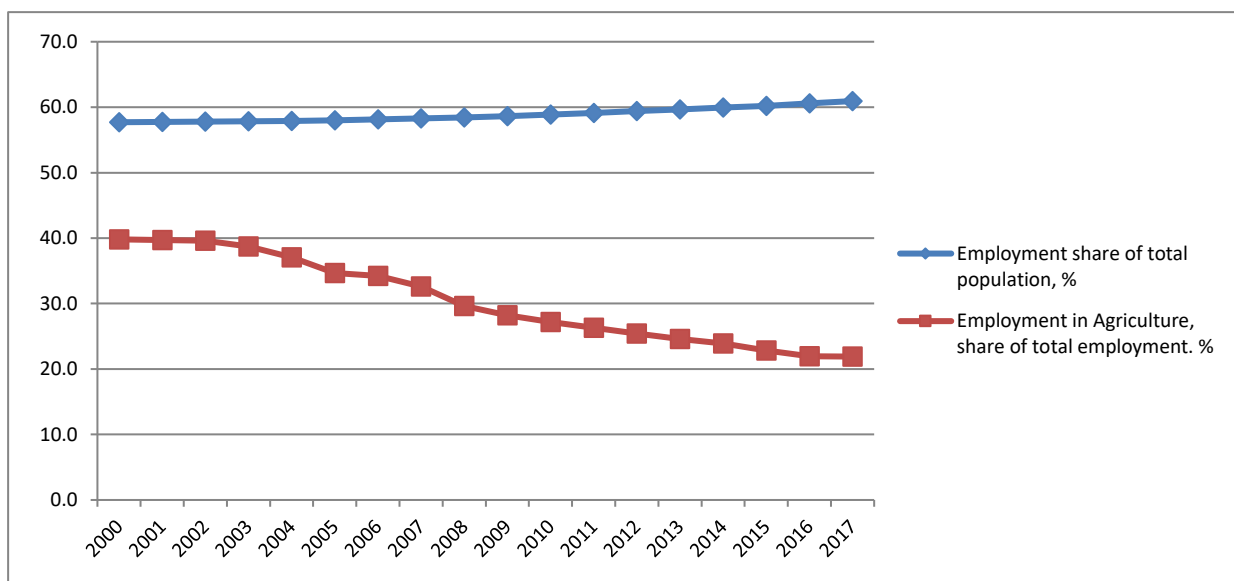


Figure 12. Total employment and employment in agriculture in Uzbekistan in 2000-2017, in %

Source: World Bank, State Committee of the Republic of Uzbekistan on Statistics

4.9 Dynamics in food trade

Food imports and exports

International food trade (imports and exports) is as important for food availability as production. Trade without distortions helps to utilise a country's comparative advantage in agricultural production. Food imports can improve food availability in a domestic market and create competition for local producers, while food exports allow local producers to compete in external markets. Domestic and international competition provides an incentive to enhance efficiency.

Due to the diversification of industrial structure in recent years, the structure of exports has changed and the increase in export of almost all groups of goods and services has been observed. External trade turnover in 2017 amounted to 26907 million USD, including exports –13893.6 million USD, imports –13013.4 million USD.

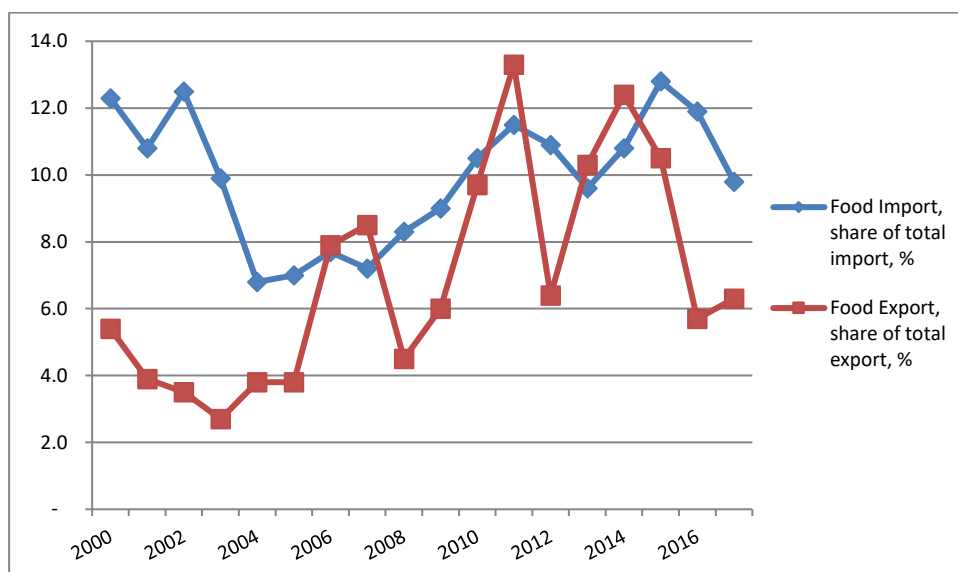


Figure 13. Export and import of foodstuff in 2000-2017, in % to total export and import respectively

Source: State Committee of the Republic of Uzbekistan on Statistics

It should be noted that in comparison with previous years, the export of finished products predominated over the export of raw materials. In particular, the share of exports of foodstuff increased from 5.7% in 2016 to 6.3% of the total export value (or 875.8 million USD) in 2017, while import of foodstuff decreased from 11.9% of the total import value in 2016 to 9.8% (or 1273.9 million USD) in 2017 (Figure 13).

Uzbekistan has become a major producer of horticultural products, with a global potential. In 2016, the country exported 818500 tons of fresh and processed fruits, vegetables and grapes to 43 countries. The majority of trade in food products takes place between Uzbekistan and CIS countries – the close neighbors of the country. The country’s main export markets are its neighbours, in particular Russia and Kazakhstan, as well as some European and Asian countries.

It should be specially noted that if in the first years of Uzbekistan’s independence the necessary food products like wheat, meat, potatoes, meat and dairy products, etc, were imported from other countries, today, as a result of the accelerated development of production not only the needs of the country's population for these products are met but they are also exported to many foreign countries.

During 2010–2017, cotton exports declined from USD 1.5 billion to USD 477.1 million, while the share of cotton exports in total exports fell from 27.5% in 2000 to 3.4% in 2017. By comparison, the share of food products in exports rose from 5% in 2000 to 6.35% in 2017. Fruit and vegetable exports grew from USD 68.7 million in 2000 to USD 1.45 billion in 2016, equating to an average annual growth rate of 21%, while the share of fruit and vegetables in total exports increased from 2% to 9%. In 2016, the value of fruit and

vegetable exports exceeded that of cotton exports by more than 30% (USD 600 million) (ADB 2018).

Prices for food

Over the past 12 years the increase in price for food products has significantly decreased (from 6.7% in 2005 to 0.3% in 2016). Average annual changes in prices for the main groups of food products for the period from 2005 to 2016 are characterized in Figure 14.

The figure shows that the inflation processes for the food group over the analyzed period most significant affected meat products, cereal products, fat and dairy products, as well as sugar, tea and other food products.

The peak of the growth in average price level for food products occurred in 2005 (6.7% per year), which is associated with a significant increase in prices for meat, poultry and fish (by 24.0%), bakery (by 12.6%), eggs (9.6%) and dairy products (6.1%), which are socially significant products and have the significant share in the structure of goods and services for calculating the CPI (in 2005 the aggregate share was 32.9 % of the total and 52.1% of food products).

The most significant slowdown of the growth rates of prices for food products was noted in 2016, when the price increase was only 0.3%. At the same time, prices for eggs increased by 8.6%, dairy products - by 4.2%, meat products - by 3.8%, while prices for bakery products decreased by 1.0% (due to decrease in prices for rice by 25.6%, mung - 11.9% and beans - 4.1%).

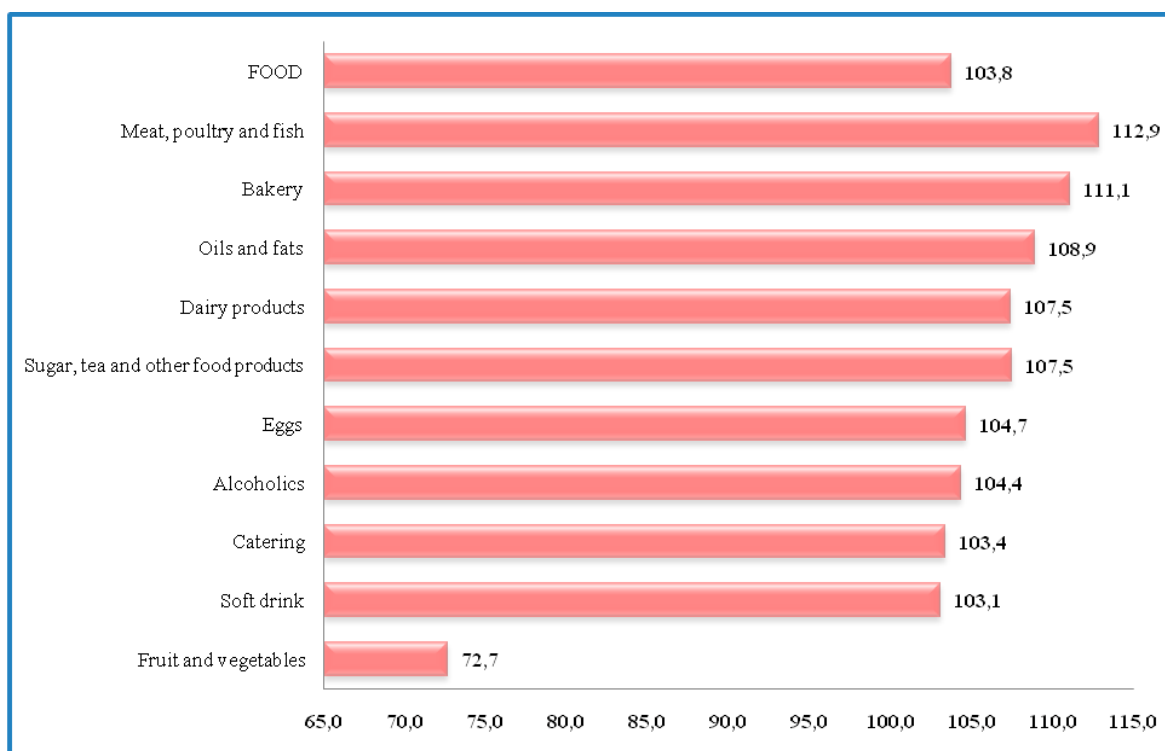


Figure 14. Changes in prices for the main food items, in %, 2016

Source: State Committee of the Republic of Uzbekistan on Statistics

4.10 Changes in food consumption

The results of measures taken by the government aimed at the consistent increase in incomes and living standards and strengthening of social support of citizens are reflected in the continuous increase in per capita incomes, wages and pensions.

According to the data below, in 2000-2016, it is possible to observe a trend in the growth of incomes, wages and pensions per capita (Table 6). But in recent years, the growth rates of wages and pensions, which are considered to be one of the main sources in the structure of income, are declining and this phenomenon has had an impact on reducing the total income of the population.

Table 6. Changes in per capita income, wages and pensions in 2000-2016

Indicators	2000	2005	2010	2016
I. Total income per capita, thousand UZS	96.4	371.8	1668.1	4565.2
<i>real growth to the corresponding period of previous year, in %</i>	124.7	117.4	120.1	110
II. Nominal average annual wages and salaries, thousand UZS	13.5	81.5	504.8	1293.8
<i>to the corresponding period of previous year, in %</i>	146	138.7	129.4	110.4
III. Average pension, thousand UZS	7.4	31.7	171.9	494.2
<i>to the corresponding period of previous year, in %</i>	152.0	143.5	125.9	112.8

Source: State Committee of the Republic of Uzbekistan on Statistics

Over the past period, there has been a gradual increase in per capita income and in 2016 compared to 2000 it actually increased by 11.7 times. Also, for this period there was an increase in the average salary and pensions by 23.6 and 18.1 times respectively.

The structure of consumer expenditures has also changed in the last decade, where expenditures on food products became stable, and the share of expenditures on non-food products and services has increased (Figure 15).

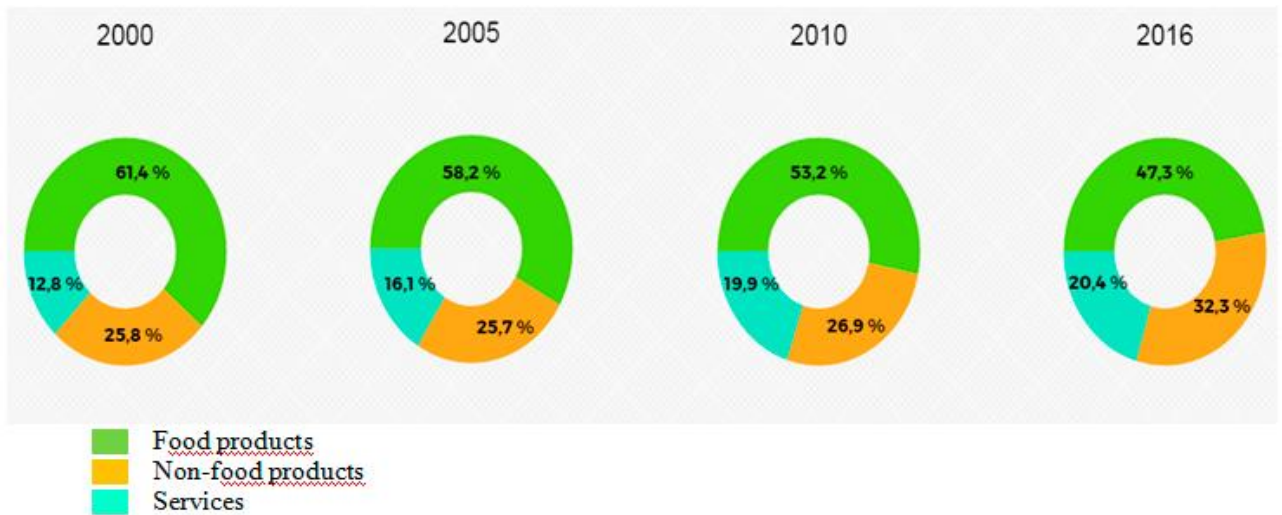


Figure 15. Structural changes in consumer expenditures in 2000-2016 (in percentage terms)

Source: State Committee of the Republic of Uzbekistan on Statistics

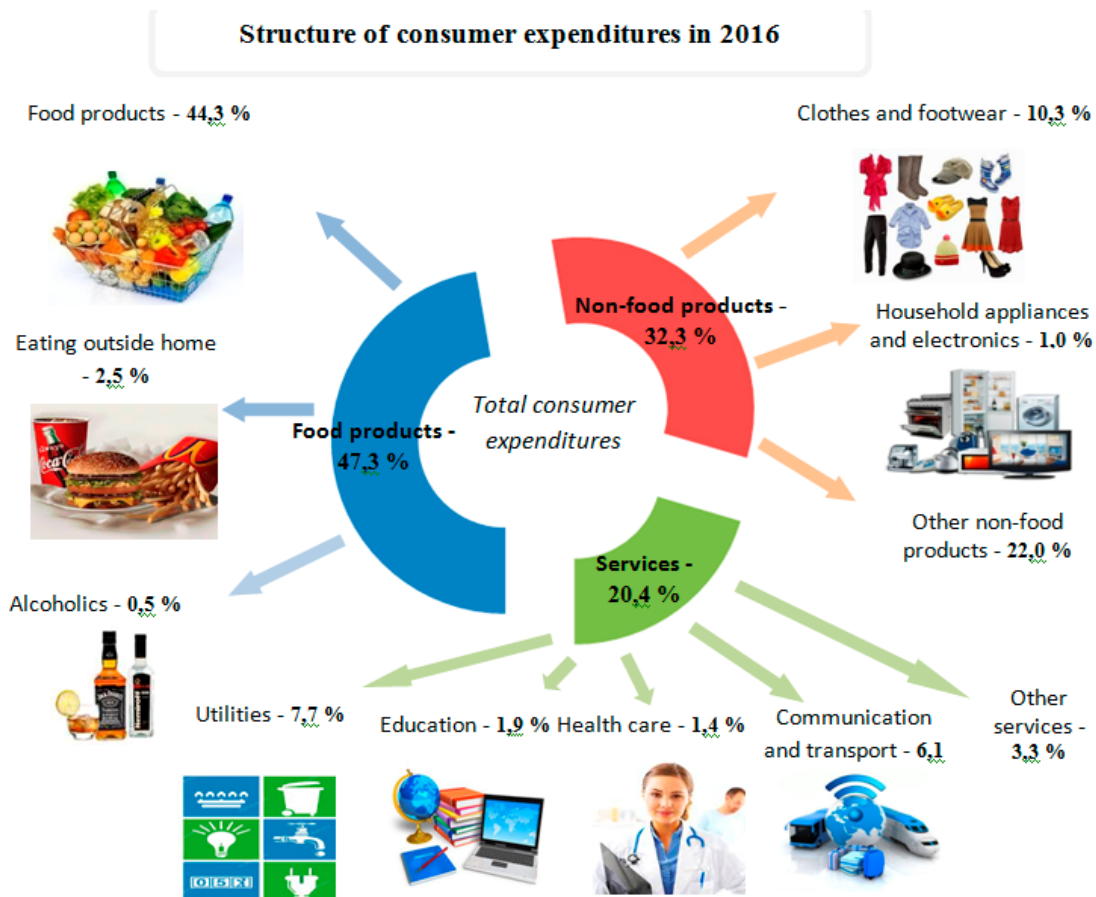


Figure 16. Structure of consumer expenditure, 2016

Source: State Committee of the Republic of Uzbekistan on Statistics

If in 2016 as compared to 2000 in the structure of consumer spending the share of expenditures on food products decreased by 14.1 units, during this period the share of expenditures on non-food products increased by 7.6 units and the share of expenditures on services increased by 6.5 units.

Interpreting the structure of consumer expenditures for the year 2016 in more details provides the following information: the population of Uzbekistan has spent the most money on food products (44.3%), non-food products (22%), clothes and footwear (10.3%), utilities (7.7%).

Together with the annual demographic growth in Uzbekistan by 29.2% in the period of 2000-2016, the population's income grew dynamically over the past 16 years, which helped to strengthen financial opportunities and increase the basic food consumption. In particular, according to official data of the state committee on statistics, consumption of vegetables in 2016 reached 277.2 kilograms per person per year, of fruits - 148.8 kilograms, of eggs - 213.6 pieces, of meat and meat products - 44.4 kilograms, of milk and dairy products - 279.6 liters, of potatoes - 56.4 kilograms, of sugar - 32.4 kilograms, and of vegetable oil - 24.0 kilograms.

4.11 Food industry development support

According to the official statistics of UzbekOzicOvkatHolding, projects in agri-food industry development in the last years have been supported in the amount of 595.6 million USD through various sources, including: (1) credits of local banks in the amount of 189.5 million USD; (2) own resources of entrepreneurs – 242.9 million USD; and (3) foreign investments and credits – 163.5 million USD.

5. Food and Nutrition security and safety

Nutrition is one of the most important factors of the healthy population. Healthy nutrition, strengthening of health and reducing the diseases, ensures the growth, normal development and well-being, and life activity of people. Any misbalance in the nutrition structure has a negative impact on human health, and is also one of the main factors in reducing the quality of life.

A set of measures has been implemented in Uzbekistan aimed at ensuring a dynamic growth in the development of the food industry and increasing the production of domestic food products. Due to this, in recent years the quality of the population's nutrition has significantly improved, the structure of food consumption has changed, per capita consumption of meat and meat products has increased by 1.3 times, milk and dairy products - 1.6 times, eggs - 2.2 times, vegetables - 2.6 times, potatoes - 1.7 times, fruits - 4.0 times⁶.

Improving the structure and diet, along with other factors, positively affected the health indicators of the population. Over the past 10 years, the proportion of children with reduced body weight decreased more than two-fold (from 4% to 1.8%), and the incidence of women with anemia decreased 2.5 times. The average life expectancy of the population of Uzbekistan increased by 6.5 years (from 67 to 73.5 years), and the average life expectancy of women - up to 75.8 years⁶.

⁶ According to the Resolution of the Cabinet of Ministers of August 29, 2015 No. 251, Annex 1, 'The concept and complex of measures to ensure healthy nutrition for the population of the Republic of Uzbekistan for the period 2015 – 2020'

At the same time, positive economic transformations and rapid urbanization, accompanied by changes in lifestyle, have led to an increase in the level of diseases associated with unsustainable nutrition, intrinsic to all economically developed countries. The World Health Organization identified these diseases as a separate group of noncommunicable diseases. An increase in the level of noncommunicable diseases, along with inadequate nutrition, is associated with inadequate physical activity, tobacco use and harmful use of alcohol.

The results of the research conducted in 2014 showed that about 67.2% of the adult population of the republic use vegetables and fruits below the WHO recommended rate, 37% - food with excessive salt content, and 16.4% of the adult population has low physical activity. As a result, 20.2% of the adult population suffers from overweight and 33.9% have high blood pressure⁶.

Due to constant focus on public health and the factors affecting it, Uzbekistan made an essential progress towards UN Sustainable Development Goal of zero hunger by 2030 (SDG 1). The Uzbekistan's Global Hunger Index scores, ranked by 2016 country scores are accordingly in 2000 - 21.8; 2008 - 15.8; and in 2016 - 13.1⁷.

5.1 FSN experts cross-views

To validate and obtaining the views of key stakeholders groups on the current status and tendencies in FSN in Uzbekistan the Food and Nutrition security and safety working group discussions were organized on March 9th, 2018 in Tashkent, Uzbekistan.

The third group of Round-table was formed to discuss the issues related to Food and Nutrition security and safety, including the medical norms; food security, food safety and nutrition-related outcomes; standards and technical norms and regulations in food processing industry, catering services and trade.

Though, the medical norms were considered as a cross-cutting issues, the group could not much elaborate on them. There were no representative from the Ministry of Health into the Round-table, though they had been invited to participate in the meeting. Despite the absence of experts of health sector, the group discussed the broad range of issues related to Food and Nutrition security and safety. The outcomes of the group discussions can be grouped into five dimensions of the Food and Nutrition security and safety. Those are:

1. The safety, quality and nutritional value of the food is of fundamental importance National Food Security and Nutrition framework in Uzbekistan.
2. Food standards cover diversity of issues, e.g. labeling, descriptions of food products, its composition, production and expiration dates, manufacturer (place and contacts), etc.
3. Food safety is considering not only the prevention of diseases caused by unhealthy food consumption, but also prevention of harm caused by the physical, chemical and biological contaminants.
4. Food hygiene and sanitary conditions and measures are important to ensure the safety of food across the chain from production to consumption, e.g. feeding animals

⁷ International Food Policy Research Institute. 2017. 2017 Global Food Policy Report. Washington, DC: International Food Policy Research Institute. <https://doi.org/10.2499/9780896292529>

or cultivating food plants, slaughtering or harvesting, processing, storage, distribution, transportation, selling, preparation and consumption.

5. Nutrition diets and awareness of its role in health and preventing diseases. Unhealthy nutrition or improper diets can cause illness and diseases in many forms and ways. Overweight, obesity and malnutrition (poor or unhealthy) are not explicit issues in Uzbekistan; however, their extent could be dynamic and vary.

Ensuring the safety of food consumers is considered as an ultimate goal of national policy on Ensuring the quality and safety of food in Uzbekistan and Food Security and Nutrition.

There are four main directions that are ensuring the safety of food consumers:

1. Provision of food and nutrition
2. Export / Import
3. Standardization
4. Legislation / Legal framework

The group discussion outputs are visually shown in Figure 17.

The further facilitation of nutrition experts group discussions revealed that 'improved food and nutrition safety and security' is not one of overarching goals of national policy, but rather with 'improved diets and healthy food consumption' can lead to improved health of population, which can be considered at the level overarching goal, like SDGs. However, this requires more comprehensive, coordinated design, planning, implementation, monitoring and evaluation of interventions towards ensuring improved food and nutrition safety and security, with special focus on vulnerable groups (Refer to Figure 18 below).

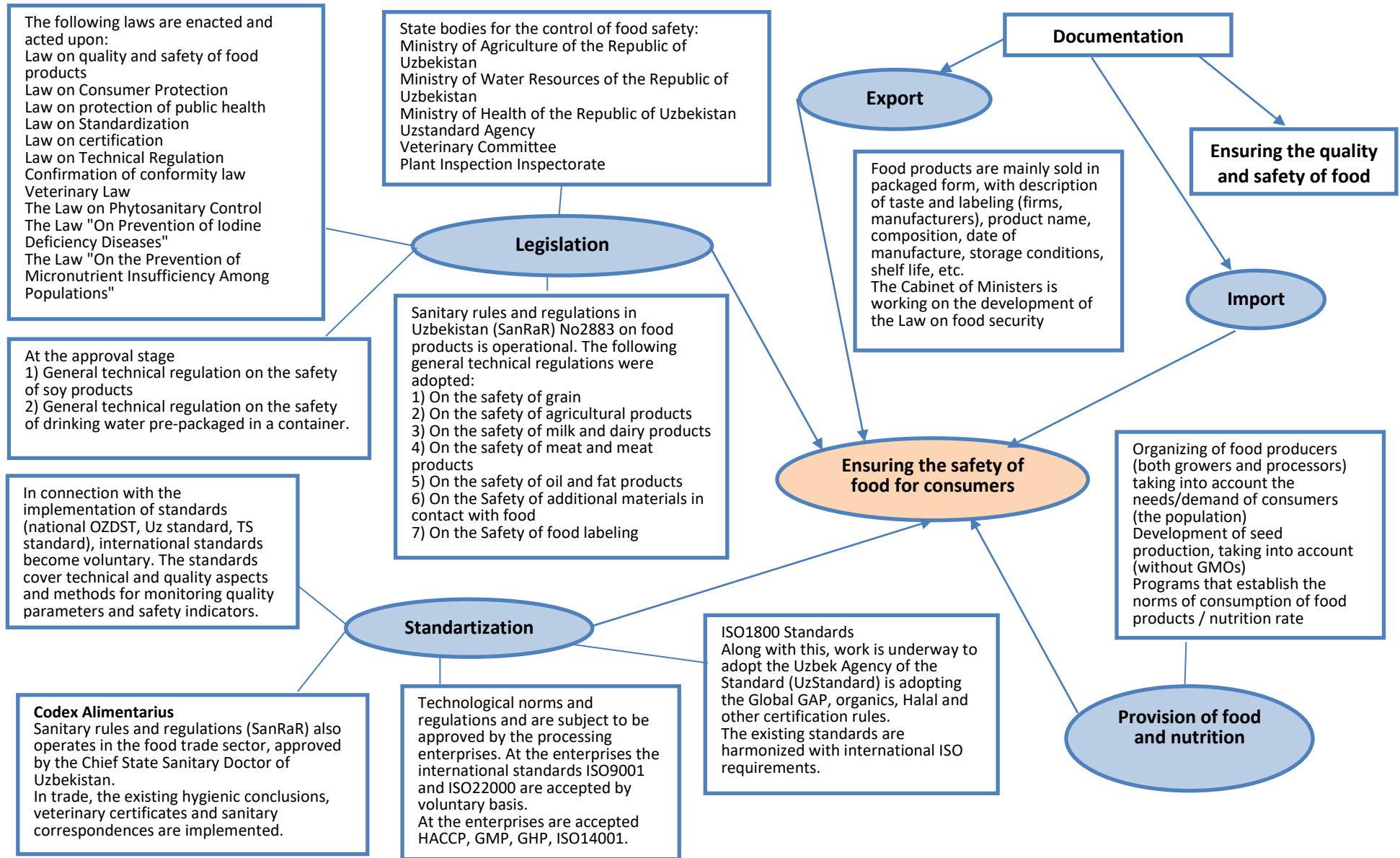


Figure 17. Conditions to ensure safety of food for consumers in Uzbekistan. Nutrition experts group discussions outputs

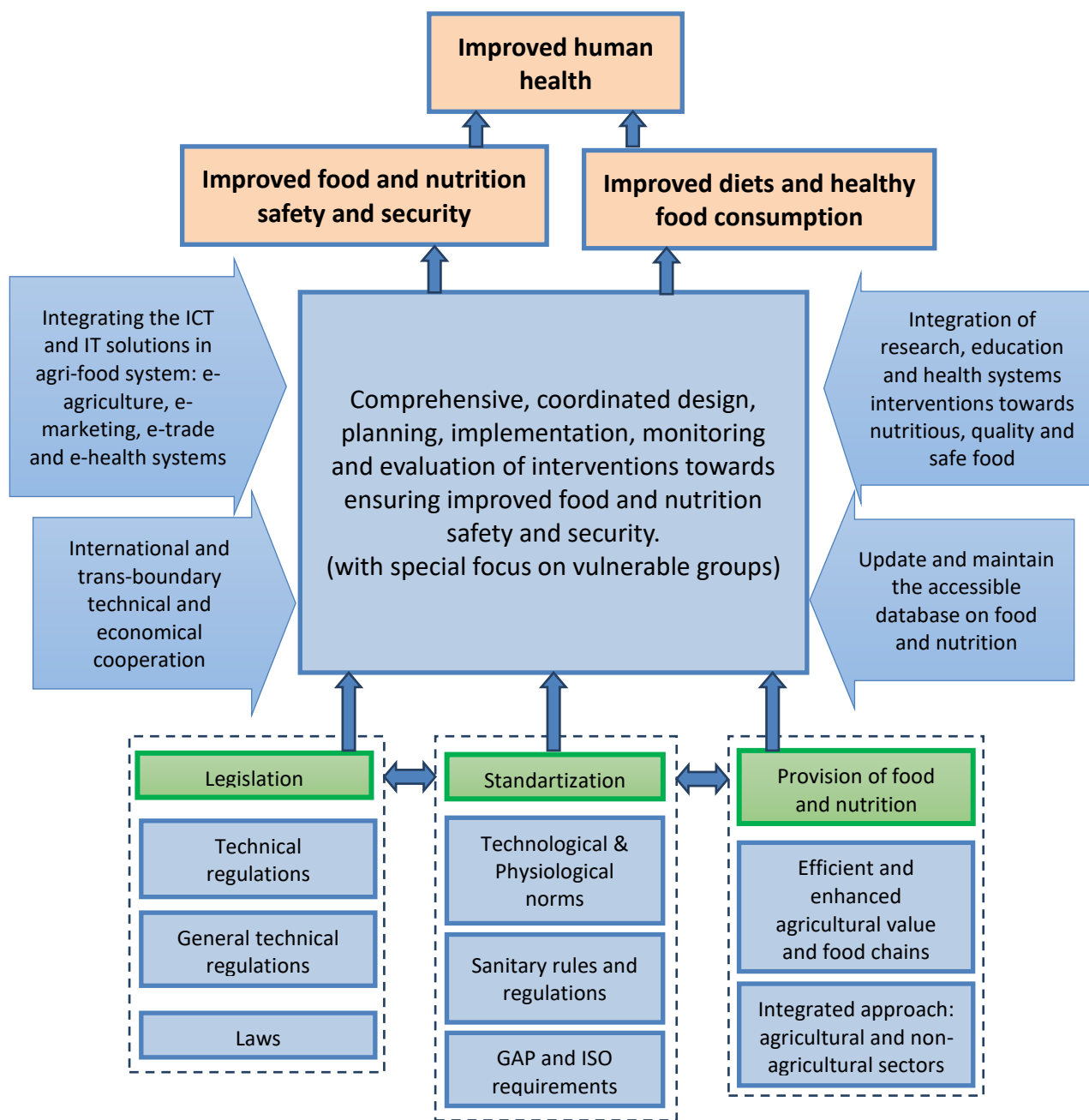


Figure 18. Proposed model for ‘improved food and nutrition safety and security’ and ‘improved diets and healthy food consumption’ leading to improved health of population in Uzbekistan

Source: Authors’ own compilation

In its turn, the achievement of these goals requires further:

- integrating the ICT and IT solutions in agri-food system: e-agriculture, e-marketing, e-trade and e-health systems;
- international and trans-boundary technical and economic cooperation;
- integration of research, education and health systems interventions towards nutritious, quality and safe food;

- monitoring of FSN and health indicators, constant update and maintain the accessible database on food and nutrition, synchronized with international standards;
- up-scaling raising awareness, advocacy interventions and targeted learning programs, and involving in this process NGOs, CSOs, private sector, research, education, and health system institutions, producers and consumers associations.

Though the legal and institutional framework seems to be conducive and many efforts are made at the political level to ensure improved food and nutrition safety and security, there is still lack of efficiency in outreaching the implementation of measures adopted at the grass-root level. There is still inadequate coordination of interventions between sectors and institutions. Therefore, the planning, implementation, monitoring of interventions should be comprehensive and participatory.

5.2 Analysis of nutrition statistics

Figure 19 below shows that the average dietary energy supply adequacy in Uzbekistan has increased from 103% in 1999 to 117% in 2014, with some decline (99%) in 2001. Also we can observe the dietary energy supply is above the minimum dietary energy requirement and average dietary energy requirements.

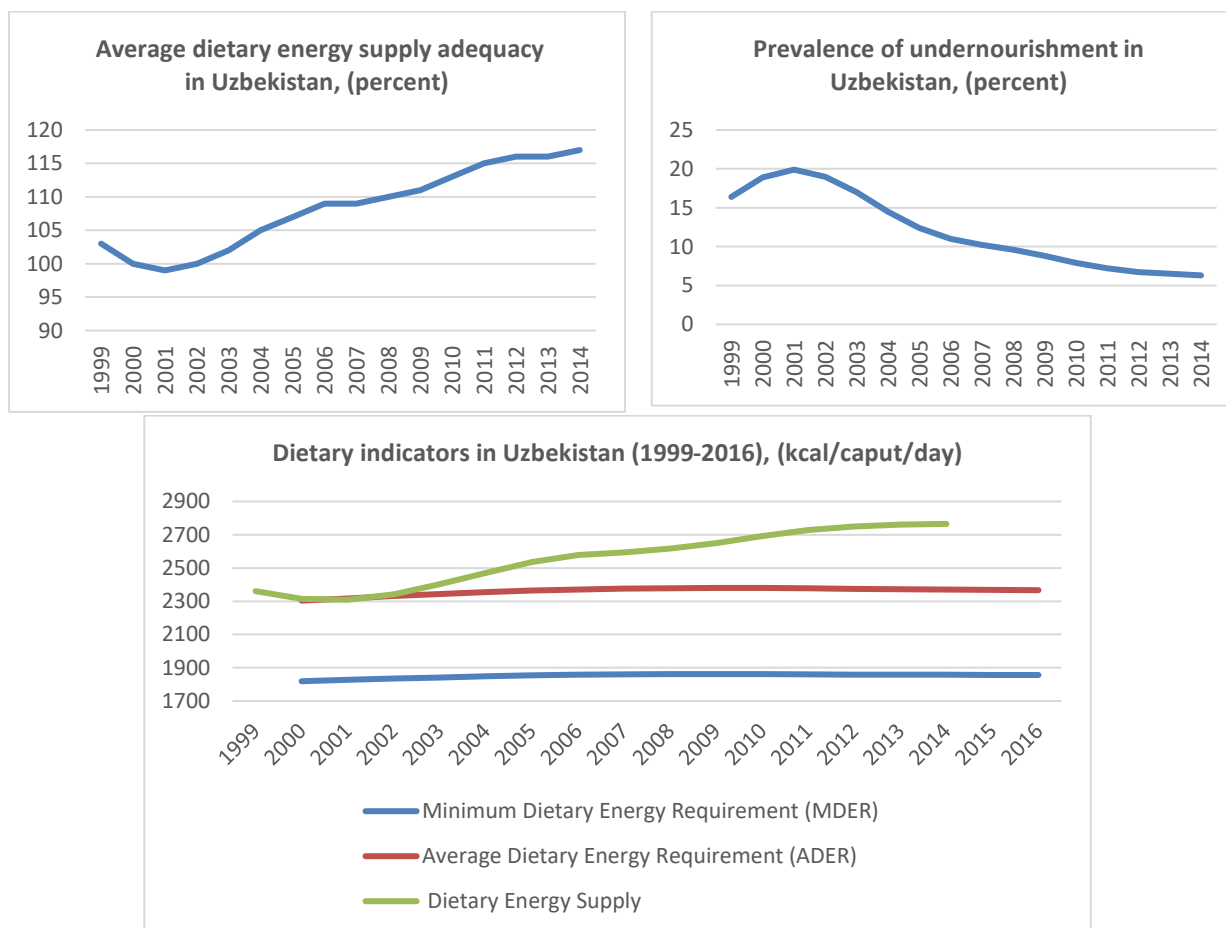


Figure 19. Dietary indicators in Uzbekistan (top left: average dietary energy supply; top right: prevalence of undermourishment; bottom: minimum, average and dietary energy supply)

Source: FAO Food security indicators

The statistical correlation between the average dietary energy supply adequacy and the prevalence of undernourishment in Uzbekistan is quite strong, i.e. -98.9%. Taking into account that dietary energy supply is above the minimum and average dietary energy requirement, it can be assumed that prevalence of undernourishment is particularly occurring due to some improper distribution of food supply, which has been tending to transform into more balanced distribution. As for the minimum dietary energy requirement, the new human energy requirement standards have resulted in an overall drop in the amount of food required, and a decline in the prevalence of undernourishment.

The average intensity of food deprivation of the undernourished, which is estimated as the difference between the average dietary energy requirement and the average dietary energy consumption of the undernourished population, then multiplied by the number of undernourished people provides an estimation of the total food deficit in the Uzbekistan, which is then normalized by the total population. Thus, Figure 20 shows the trend / decrease of depth of the food deficit from 112 kcal/caput/day in 1999 to 43 kcal/caput/day in 2014. It also indicates how many calories would be needed to lift the undernourished from their status, if everything else being constant. The statical correlation between the depth of the food deficit and number of people undernourished in Uzbekistan is very strong, i.e. 99.9%. And the decrease of number of undernourished people from 4 mln in 1999 to 1.9 mln in 2014 manifests the decline of food insecurity and the improving policies for more effective interventions and responses.

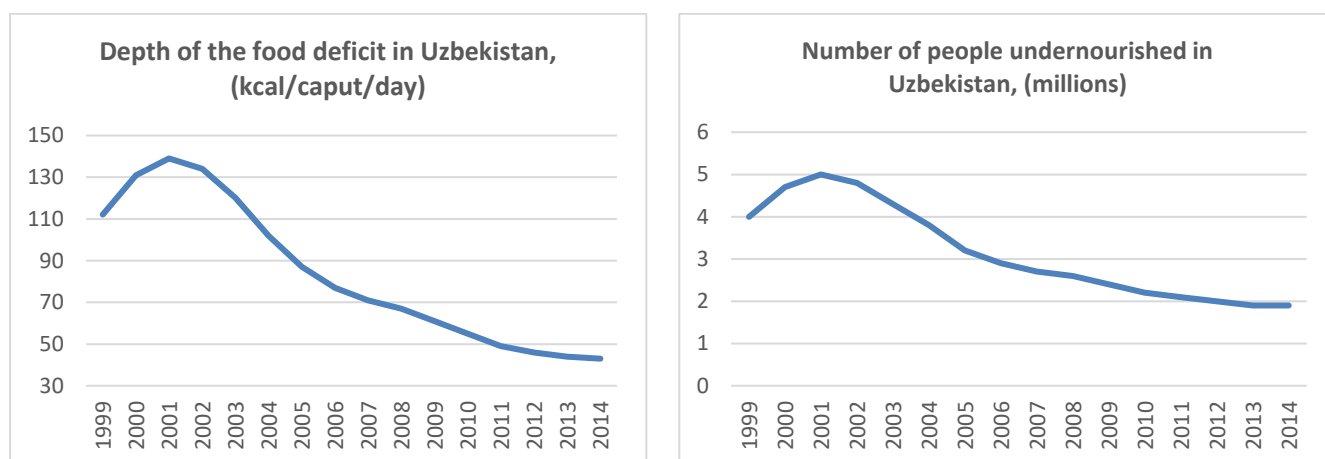


Figure 20. Undernourishment indicators in Uzbekistan (left: food deficit; right: quantity of undernourished people)

Source: FAO Food security indicators

The improvement of FSN policies in Uzbekistan and responsive interventions can also be observed from Figure 21. We can make a hypothetical conclusion that due to improving the livestock sector, and accordingly the increase of supply of protein of animal origin in Uzbekistan from 23 gr/caput/day in 1999 to 23 gr/caput/day in 2011 has reduced the share of dietary energy supply derived from cereals, roots and tubers from 59% in 1999 to 55 % in

2011. The statistical correlation between dietary energy supply derived from cereals, roots and tubers and supply of protein of animal origin is relatively high, i.e. 83.3% over the period 1999-2011.

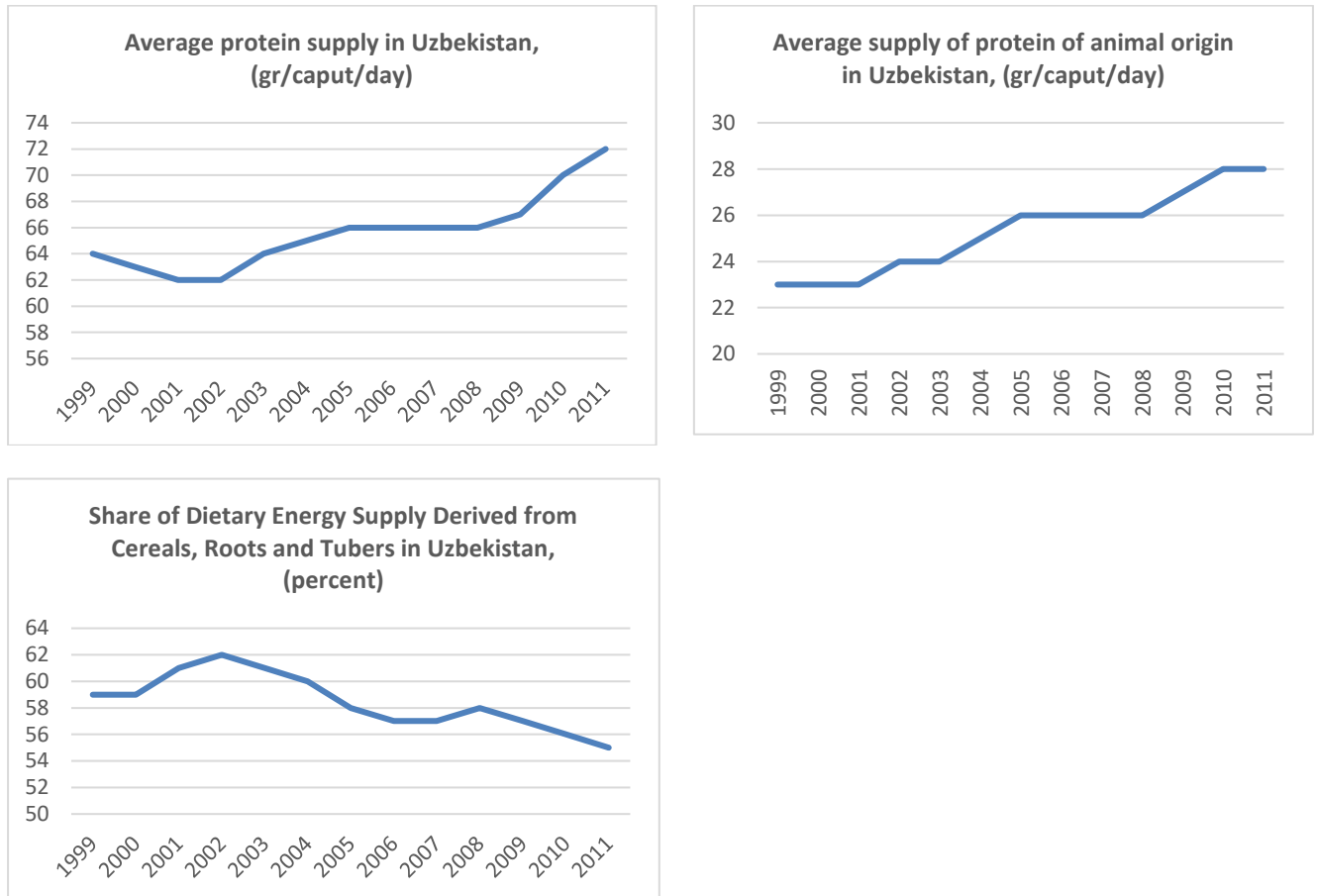


Figure 21. Some indicators of shift in dietary energy supply in Uzbekistan

Source: FAO Food security indicators

Indicators on availability, accessibility, stability and utilization of food and nutrition can vary, but interdependent. The increase of food production and supply may vary depending on diversity internal and external factors (Figure 22). The variability of food, even being tending to enhancing, also imposes the both positive and negative impact on human health.

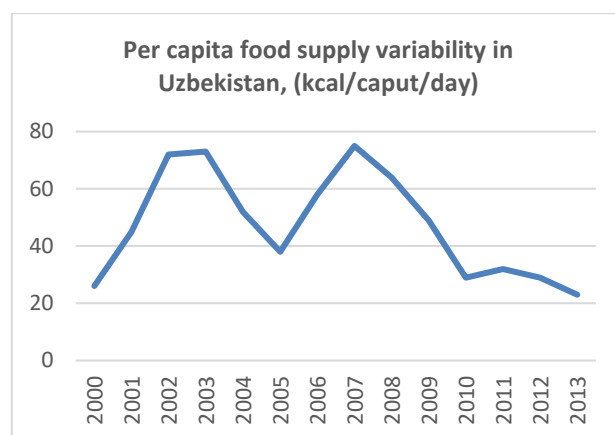
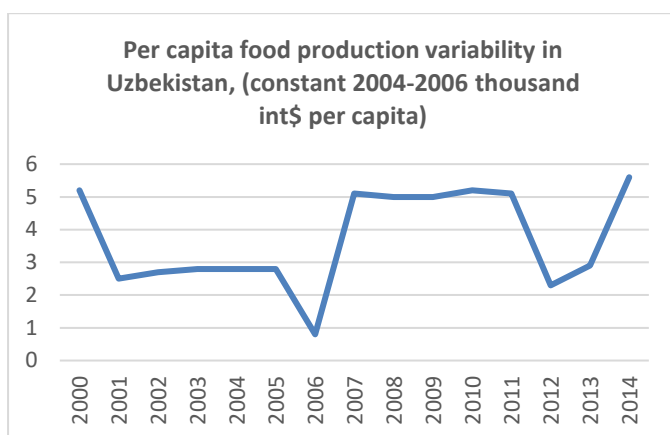


Figure 22. Per capita food production and supply variability in Uzbekistan

Source: FAO Food security indicators

The prevalence of obesity in the adult population in Uzbekistan in the last decade has been steadily increasing from 8.3% in 2000 to 14.4% in 2014 (Figure 23). At the same time, the prevalence of anemia among women of reproductive age in Uzbekistan has been declining from 48.2% in 2000 to 36.2% in 2016 (Figure 24).

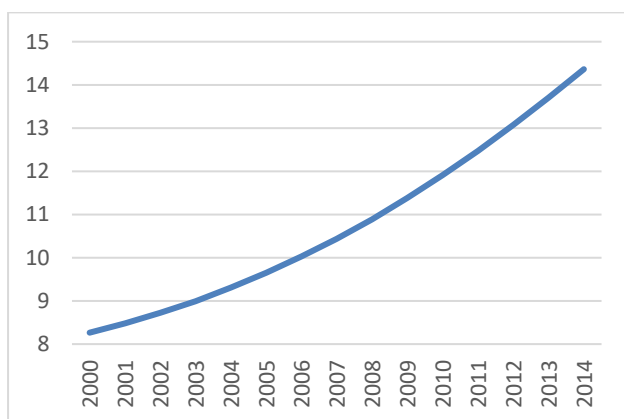


Figure 23. Prevalence of obesity in the adult population (18 years and older), in Uzbekistan, in %

Source: FAO Food security indicators

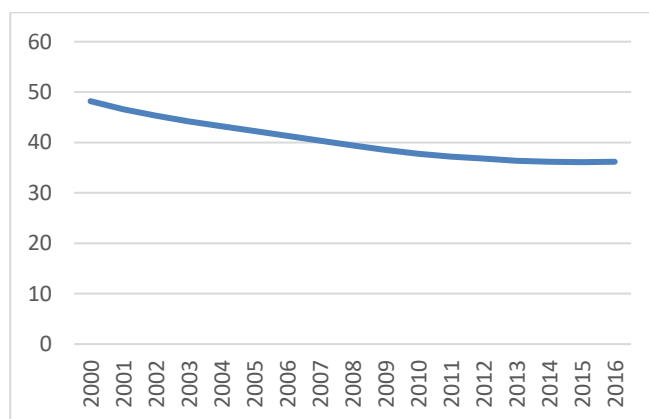


Figure 24. Prevalence of anemia among women of reproductive age (15-49 years), in Uzbekistan, in %

Source: FAO Food security indicators

5.3 Physiological norms and requirements in food substances and energy

Previously adopted in the Uzbekistan the physiological norms of consumption in food substances and energy (valid from 1995 to 2000) have not been re-examined for more than 10 years. During this period, positive economic transformations and rapid urbanization, accompanied by changes in lifestyle, led to an increase in the level of diseases associated with inefficient nutrition, characteristic of all economically developed countries. The World Health Organization identified these diseases as a separate group of noncommunicable diseases.

Previously, the main goal/criteria in the development of standards of requirements was the establishment of a minimum level of micronutrient, which is necessary to prevent the development of a clinical status of hypovitaminosis or hypomicroelementosis in more than 97% of the population of the respective age and gender group.

Sanitary rules and hygienic standards "Physiological norms of requirements for food substances and energy for sex and age disaggregated groups and professional populations of the Republic of Uzbekistan to maintain a healthy nutrition" amended and adopted in 2017⁸ are medical criteria aimed at ensuring healthy nutrition when rationing the average daily recommended norms for food consumption for various population and professional groups, and evaluation of diets and in the conducting the research work in the field of evaluation and planning nutrition norms for various age and professional groups of the population of Uzbekistan.

At the present time, indicators' values are set in the basis of established norms, which can also have some positive effect on human health, including increasing the overall resistance to the effects of negative environmental factors and reducing the risk of developing some alimentary-dependent diseases. In fact, this means providing the body is not the minimum necessary, but the optimal number of micronutrients for life. In this connection, the revised norms cover all possible professional and sex-age groups of the population. These norms take into account the recommendations of the WHO and regional characteristics related to the climate and nutritional characteristics of the population of Uzbekistan.

The physiological need of an adult able-bodied population has been developed in five groups of labor intensity, depending on the amount of daily energy spent, nervous tension in the process of performing the labor process, some of its operations, taking into account WHO recommendations, the norms for women during pregnancy and lactation are adapted with WHO recommendations on " Good Maternal Nutrition: The best start in life ".

The professional groups disaggregated by labor intensity according to the Physiological norms of requirements for food substances and energy are as follows:

- I group. Professionals of predominantly intellectual work;
- II group. Professionals engaged in light physical labor;
- III group. Professionals engaged in average physical labor;

⁸ These sanitary rules and norms (SanPiN № 0347-17) on the Physiological norms of requirements for food substances and energy for sex and age disaggregated groups and professional populations of the Republic of Uzbekistan to maintain a healthy nutrition. The present sanitary rules were drawn up in the execution of the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan dated April 25, 2015 No. 102 "On further improvement of measures in the field of healthy nutrition of the population of the Republic of Uzbekistan", and also on August 29, 2015, No. 251 "On the approval of the Concept and the Set of Measures on ensuring healthy nutrition of the population of the Republic of Uzbekistan for 2015-2020 ", within the framework of the biennial agreement on cooperation between the Ministry of Health and the WHO Regional Office for Europe for 2016-2017. were considered and approved at the meeting of the Scientific Council of the Scientific Research Institute of the State Public Health Service of the Ministry of Health of the Republic of Uzbekistan (Protocol No. 7 of July 26, 2016). These sanitary rules and norms were reviewed and approved at a meeting of the Committee on the Regulation of Potentially Adverse Factors of the Human Environment at the Ministry of Health of the Republic of Uzbekistan (Minutes No. 3 of March 7, 2017). A legal examination was carried out by the Ministry of Justice of the Republic of Uzbekistan (letter No. 6-21 \ 33-4190 \ 6 of March 17, 2017).

- IV group. Professionals of heavy physical labor;
- V group. Workers engaged in particularly heavy physical labor.

The list of professions of professional groups is provided in Annex 5.

This division does not cover the whole variety of existing professions, but allows, practically for any specialty, to find the intensity of labor close to it in the list of one or another group. In connection with the less intensive course of metabolic processes and less body weight, the need for women in energy can be accepted on average 15% less than for men. It has been established that the need for energy is increased in persons whose labor is characterized by physical and neuropsychic load, and in modern conditions the significance of the latter has slightly increased. To specify this issue, it is necessary to turn to nutritionists specialists who, in accordance with Resolution No. 102 of the Cabinet of Ministers of the Republic of Uzbekistan of April 25, 2015, "On further improvement of measures implemented in the area of healthy nutrition of the population of the Republic of Uzbekistan", are prepared to provide advisory services on healthy nutrition and dietetics.

When determining the energy needs of an adult able-bodied population, it was found expedient to make all calculations for three age categories: 18-29 years, 30-39 years and 40-59 years. The basis for this was some age-specific features of metabolism. Thus, at the age of 18-29, the features of exchange are associated with incomplete and continuing processes of growth and physical development.

When developing the energy demand for the population aged 18 to 60 years, the average normal body weight (ideal body weight for men is 70 kg, for women - 60 kg). The energy requirement can be calculated on the basis of 1 kg of average normal body weight (ideal mass). It is established that the energy requirement per 1 kg of ideal mass of men and women are practically the same and makes 167.4 kJ (40 kcal) for group I, 179.9 kJ (43 kcal) for group II, 192.5 kJ for group III (46 kcal), for group IV - 221.7 kJ (53 kcal), for the V group - 255.2 kJ (61 kcal).

Accepted norms of physiological needs in energy and nutrients can not serve as a basis for the norms of the formulas of food supplements) to food or medicines, as well as, prescribing medicines or dietary supplements to food consisting of medicinal plants or a complex of microelements with a high level the content of highly active substances without clearly defined doses and a clear knowledge of the mechanisms of action, in some cases may lead to the fact that compensatory-adaptive reactions in consumers and may be occurred as inadequate: stronger than necessary, or weakened. This can cause subsequent pathological changes in the body. In this connection, the composition of nutraceuticals and the properties of dietary supplements declared by the manufacturer are decided on the basis of the combined properties of trace elements in dietary supplements to food by the Pharmaceutical Committee of the Republic.

In connection with this, the "top safe level of consumption" of vitamins and mineral elements is evaluated by pharmacologists separately for each drug. In other words, the drug is

considered from the point of view of the combined action on the body and it is proposed to register as medicines or dietary supplements to food.

Table 7. Recommended daily average physiological norms of requirements in food substances for different sex and age disaggregated groups of children

Age group	Protein, grams	Fat, grams,	Carbohydrates, grams
Both boys and girls			
0-3 months	2.2	6.5	13
4-6 months	2.6	6.0	13
7-12 months	2.9	5.5	13
1-3 years	53	53	212
4-6 years	68	68	272
7-10 years	78	79	335
Boys			
11-13 years	90	92	390
14-17 years	98	100	425
Girls			
11-13 years	82	84	355
14-17 years	90	90	360

Source: These sanitary rules and norms (SanPiN № 0347-17) on the Physiological norms of requirements for food substances and energy for sex and age disaggregated groups and professional populations of the Republic of Uzbekistan to maintain a healthy nutrition, adopted in 2017.

Table 8. Recommended average daily physiological norms of requirements in mineral substances for various sex-age groups of children

Age group	Calcium, mg	Phosphorus, mg	Magnesium, mg	Iron, mg	Zinc, mg	Selenium Mkg	Iodine, Mkg
Both boys and girls							
0-3 months	400	300	55	4	3	6	90
4-6 months	500	400	60	7	3	6	90
7-12 months	600	500	70	10	4	10	100
1-3 years	800	800	150	10	5	17	110
4-6 years	900	1350	200	10	8	22	110
7-10 years	1100	1650	250	12	10	25	120
Boys							
11-13 years	1200	1800	300	15	15	30	130
14-17 years	1300	1800	300	15	15	35	130
Girls							
11-13 years	1200	1800	300	18	12	30	130
14-17 years	1300	1800	300	18	12	35	130

Source: These sanitary rules and norms (SanPiN № 0347-17) on the Physiological norms of requirements for food substances and energy for sex and age disaggregated groups and professional populations of the Republic of Uzbekistan to maintain a healthy nutrition, adopted in 2017.

5.4 Healthy nutrition

The main objectives for ensuring healthy nutrition of the population of the Republic of Uzbekistan are:

- reducing morbidity and premature mortality by creating conditions that meet the needs of different groups of people in healthy nutrition, physical activity and reducing the consumption of alcohol and tobacco products;
- organization of broad explanatory work and strengthening of healthy nutrition propaganda as the basis for a healthy lifestyle of the population, including the active use of the mass media;
- the development of educational programs for various groups of the population on healthy nutrition, aimed at reducing the prevalence of diseases associated with nutrition, the priority development of basic research in the field of healthy nutrition;
- improvement of the organization of nutrition in organized groups, provision of adequate nutrition to pregnant and lactating women, as well as children under the age of 3, improvement of dietary (curative and preventive) nutrition in medical and preventive institutions as an integral part of the medical process;
- expansion of domestic production of the main types of food raw materials in accordance with modern requirements for quality and safety, as well as the development of the production of food products enriched with essential components, specialized products for baby food, dietary (curative and preventive) foods and biologically active food supplements;
- development and adoption of technical regulations and government standards related to food products and food raw materials;
- perfection of mechanisms for quality control of food products and food raw materials produced in the territory of the Republic of Uzbekistan and imported from abroad;
- the development and implementation of monitoring programs in the field of nutrition based on the analysis of health indicators of the population and the dynamics of the development of widespread alimentary-dependent conditions.

The Republic of Uzbekistan set the legal and institutional framework⁹ towards healthy nutrition aimed at preserving and strengthening the health of the population, preventing diseases, and enabling conditions that meet the needs of various groups of the population in healthy nutrition. The main structural transformations underpinning the framework are as following:

1. Create the Republican Commission for the organization and control over the implementation of a set of measures in the area of healthy nutrition of the population of the Republic of Uzbekistan, with assignment its working body functions to the Republican

⁹ According to the Resolution of the Cabinet of Ministers of The Republic of Uzbekistan of April 25, 2015, #102 on ‘Further improvement of the implemented measures in the field of healthy nutrition of the population of the Republic of Uzbekistan’

Commission to the Ministry of Health of the Republic of Uzbekistan, the main tasks of which are:

- coordination of activities of ministries, departments, institutions and organizations, regardless of the form of ownership associated with the implementation of a set of measures in the field of healthy nutrition of the population of the Republic of Uzbekistan;
 - revision of existing and development of new regulatory and legal acts in the sphere of healthy food supply for the population of the Republic of Uzbekistan;
 - creation of conditions for attracting funds from international organizations and foreign investors to the food industry and agriculture;
 - organization of regular monitoring of progress in the implementation of a set of measures in the field of healthy nutrition of the population.
2. Establishment of the Republican Educational and Scientific Dietetics Center at the Tashkent Medical Academy, as agreement between Ministry of Health and the Ministry of Economy of the Republic of Uzbekistan, which main tasks include:
- the implementation of the functions of the parent organization for the conduct of a single scientific and practical policy in the field of healthy nutrition and dietology in accordance with modern international standards for the quality and safety of food;
 - development and implementation of effective methods and training programs on healthy and dietary nutrition for health professionals and various population groups, training of specialists, bachelors, masters and clinical residents on healthy nutrition;
 - carrying out scientific research aimed at expanding the domestic production of basic types of food products in accordance with modern requirements of quality and healthy nutrition, to improve the structure of nutrition of the population of the Republic of Uzbekistan.
3. The Ministry of Higher and Secondary Special Education of the Republic of Uzbekistan is introducing the specialty on "dietology" into higher education system.
4. The Ministry of Finance and the Ministry of Labor and Social Protection of the Republic of Uzbekistan are introducing the position of doctor-dietologist as the standard staff in the health and prophylactic institutions.
5. The concept and a set of measures to ensure healthy nutrition for the population of the Republic of Uzbekistan for the period 2015-2020¹⁰ are aimed at the following priority measures:
- prevention and reduction of the prevalence of diseases associated with malnutrition, the organization of broad awareness campaign to promote the healthy food consumption, as the basis for a healthy lifestyle of the population;
 - improvement of the regulatory and legal framework for the further streamlining of the catering system in educational and medical institutions, improving the diet of children's organized groups, introducing effective quality control mechanisms of food

¹⁰ 'The concept and complex of measures to ensure healthy nutrition for the population of the Republic of Uzbekistan for the period 2015 – 2020' Annex 1 to the Resolution of the Cabinet of Ministers of August 29, 2015 No. 251.

and food products produced in the territory of the Republic of Uzbekistan and imported from abroad;

- creation of enabling conditions to address the population's needs for healthy nutrition by stimulating domestic production of food products, especially products enriched with the most important micronutrients, with the focus of production food products made of local raw materials, creating an conducive environment to the introduction of the principles of healthy nutrition among the population;
- Conducting of fundamental scientific researches in the field of healthy nutrition and dietology, aimed at studying the diet among various groups of the population and the causes of the common diseases associated with nutrition.

Within the framework of the implementation of this Concept, the following measures are implemented:

- a) improvement of the regulatory and legal framework governing relations in the field of providing the population with a healthy diet and the formation of a healthy lifestyle, including:
 - introduction of changes and amendments to the legislation aimed at expanding the range of domestic quality and safe food products;
 - systematization of a healthy diet in public educational and medical institutions;
 - improvement of mechanisms for the uninterrupted supply of potassium iodate to enterprises producing edible salt, with the constant monitoring of the production of iodized salt;
 - monitoring and control of the sale of alcohol products;
 - establishment of effective control over the quality and safety of food products consumed in educational institutions;
 - improving the daily diet of children's organizations by increasing the range of foods enriched with vitamins and micronutrients;
- b) the implementation of measures aimed at improving the mechanisms for providing the population with a healthy diet and the formation of a culture of a healthy lifestyle:
 - expansion of the assortment of dietary sour-milk products produced by domestic food industry enterprises;
 - expansion of assortment of food products with low salt content based on vegetable fiber;
 - increase production and industrial processing of medicinal plant stevia - sugar substitute;
 - continuation of the implementation of state programs to provide the population with the most important micronutrients;
 - creation of conditions conducive to healthy nutrition and the maintenance of a healthy lifestyle in educational institutions and other organizations;
 - the implementation of a pilot project aimed at creating a culture of healthy nutrition and lifestyle among the population of Kashkadarya and Fergana regions, with the

- subsequent dissemination of the positive experience gained to all regions of the republic;
 - development of recommended average daily nutrition for different sex and age groups and occupational groups, taking into account the therapeutic and prophylactic properties of food;
 - improvement of logistic schemes for delivery of agricultural produce and livestock products "from field to producer", "from producer to consumer";
 - improvement of existing economic mechanisms for stimulating economic entities engaged in the production of food products, including children's and dietary, as well as the processing of agricultural fruits and vegetables and meats
- c) conducting research in the field of healthy nutrition and dietetics:
- carrying out of scientific researches on development of iodine production using local raw materials;
 - the study of the diet among various groups of the population and the causes of the development of common diseases associated with inappropriate nutrition;
 - the development of scientifically based recipes for dietary foods and beverages based on local food for children and adults;
 - study the prevalence of iron deficiency anemia and iodine deficiency in the population;
- d) the organization of advocacy work in the field of healthy nutrition and the formation of a culture of a healthy lifestyle:
- expansion of the spectrum and quantity of social TV, radio, publications in print and electronic media;
 - involvement of well-known public persons in politics, science, art, sports and public figures in the process of popularization of healthy nutrition and the formation of a healthy lifestyle among the population;
 - monitoring and evaluation of the results of ongoing outreach activities;
 - expanding outreach work among the population, especially young people, on healthy diets, physical activity, harmful health consequences from the use of alcohol and tobacco products;
- e) further improvement of the quality of training of medical personnel:
- the introduction of curricula in the field of healthy nutrition for secondary specialized, professional, higher and postgraduate education;
 - introduction of curricula on healthy nutrition and nutrition for students of medical higher educational institutions and professional colleges;
 - preparation of Masters degree on the specialty "Dietology";
 - annual training of specialists in the areas of healthy nutrition, dietetics, physical activity and the harmful effects of alcohol and tobacco products.

The expected outcomes of the implementation of the Concept, by 2020, as follows:

- increase consumption by the population of vegetables and fruits by 15%;

- reduce consumption of foods with high salt content by 15%;
- increase the proportion of pregnant, infants and children under five years of age, whose diet will meet the principles of healthy eating, by 10%;
- reduce tobacco consumption and harmful alcohol consumption by 10%;
- expand domestic production of healthy, safe and quality of agricultural plant, meat and dairy products;
- increase the volume of production, processing and sale of products with a low content of free sugars, salt, saturated and trans-fatty acids;
- increase the share of production of foods enriched with vitamins and necessary minerals.

5.5 Quality and Safety of food products

National Governance of the quality and safety of food products is carried out by:

- State Sanitary and Epidemiological Service of the Ministry of Health of the Republic of Uzbekistan,
- Veterinary Committee of the Republic of Uzbekistan,
- State Inspectorate for Plant Quarantine under the Ministry of Agriculture and Water Resources of the Republic of Uzbekistan
- Uzbek Agency for Standardization, Metrology and Certification.

State regulation in the field of quality assurance and food safety is carried out by establishing sanitary, veterinary rules and norms, phytosanitary norms, rules and hygienic standards, state standards, technical conditions determining requirements for quality and safety of food products, the conditions of its production, procurement, purchase, processing, supply, storage, transportation and sale.

Food products, as well as equipment for its production and use in contact with food, can be produced, imported into the territory of the Republic of Uzbekistan, implemented and applied after assessing their compliance with the requirements of norms and regulations on the quality and safety of food products and their state registration.

The state registration of the food products and equipment that are made in the Republic of Uzbekistan and imported to the territory of the Republic of Uzbekistan is carried out by the state sanitary inspection when issuing a sanitary and epidemiological certificate.

Food products, technologies, equipment, products and facilities for food production, storage, transportation and trade are subject to certification in order to confirm their compliance with norms and rules.

Legal entities and individuals engaged in the production, procurement, purchase, processing, supply, storage, transportation and sale of food products, ensure production control over compliance with established norms and rules. The procedure for conducting production control is determined in accordance with the requirements of norms and rules for the quality and safety of food products, regulatory and technological documentation, taking into account

the specifics and conditions of the work and services performed by them and is coordinated with the relevant state supervision bodies.

Legal entities and individuals engaged in the process of development and production of new food products or its improvement, as well as in the development of production technology are required to justify safety, shelf life, quality indicators and methods for controlling food products. Indicators of food quality, requirements for its safety are mandatory and included in the regulatory documentation for this product.

The production of new food products, the introduction of new technological processes, equipment is allowed after their toxicological and hygienic examination, and food raw materials of animal origin - after veterinary and veterinary-sanitary examination conducted by the State Veterinary Service, and (or) obtaining the sanitary-epidemiological conclusion of bodies implementing state sanitary inspection, veterinary certificate of the state veterinary service on the conformity of products with established rules and regulations and introducing the food product in the state register of food products.

Legal entities and individuals producing food products are obliged to produce them in a packaged form (ensuring preservation of quality and nutritional value at all stages of circulation) and labeled in accordance with the legislation. Prepackaged and packaged foods, biologically active food additives, food additives must have labels (leaflets), which indicate:

- the name of the food product;
- the purpose of the food product (for specialized products of children's and dietary nutrition);
- the name of the manufacturer;
- trademark (for organizations that have it);
- the names of ingredients included in the food product, including food additives;
- nutritional value, grade;
- storage conditions;
- date of manufacture, expiry date;
- method of preparation (for semi-finished products and specialized products of children's and dietary nutrition);
- weight;
- method of use (for biologically active additives, food additives, specialized products of children's and dietary nutrition);
- a conformity mark (for companies that have a license for the right to label products with a mark of conformity);
- numbers of normative or technical documentation.

Food products imported to the territory of the Republic of Uzbekistan must comply with the requirements of the norms and rules specified in the law of the Republic of Uzbekistan about quality and safety of foodstuffs. The supplier of imported food products for its state

registration shall provide the documents of the manufacturer and the specially authorized body of the exporting country, confirming the safety of these products, and if necessary, carrying out the relevant examination, samples of food products. Imported food products, technologies and equipment are subject to compulsory certification in accordance with the law. The conformity of quality and safety of food products imported into the Republic of Uzbekistan with norms and rules is determined by the state supervision authorities jointly with the customs authorities in accordance with the established procedure.

Legal entities and individuals carrying out storage and transportation of food products are obliged to comply with the norms and rules, ensure the safety of quality and safety of food.

The sale of food products subject to compulsory certification is carried out by legal entities and individuals with a certificate of conformity or a conformity mark confirming the quality and safety of food products. The sale of food products in retail is carried out in accordance with the rules approved by the Cabinet of Ministers of the Republic of Uzbekistan. The sale of food products is allowed in places designated for these purposes by state local authorities. The sell food products is not allowed in the following cases:

- inconsistencies in product quality with the requirements of established norms and rules, and for products subject to mandatory certification - lack of certificates of conformity;
- lack of proper storage and sale conditions;
- expiry date expiration;
- falsification of products;
- impossibility of its identification.

5.6 Prevention of micronutrients insufficiency among the population in Uzbekistan

The main directions of state policy in the field of prevention of micronutrient deficiency among the population in Uzbekistan are:

- implementation of social, economic, legal and organizational measures aimed at providing the population with enriched food products;
- ensuring state control over the quality and safety of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- development of production of enriched food products;
- support the production of vitamin-mineral mixtures intended for the enrichment of food products;
- supplementation by micronutrients;
- monitoring and evaluation of the implementation of programs aimed at the prevention of micronutrient deficiency among the population;
- support of scientific research in the development of modern technologies for detecting micronutrient deficiency and methods of its prevention;
- development of international cooperation.

Public governance of the prevention of micronutrient insufficiency among the population is carried out by the Cabinet of Ministers of the Republic of Uzbekistan, the Ministry of Health of the Republic of Uzbekistan, the Uzbek Agency for Standardization, Metrology and Certification, local government bodies. Public administration in the field of prevention of micronutrient deficiency among the population includes:

- coordination of the activities of government bodies, as well as producers of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- implementation of state control over the quality and safety of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- development of normative documents, organization and maintenance of work in the field of technical regulation concerning mandatory requirements for the safety of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- organization of preventive and sanitary-epidemiological measures.

Towards the prevention of micronutrient insufficiency among the population the Ministry of Health of the Republic of Uzbekistan:

- implements state sanitary supervision in the field of prevention of micronutrient deficiency among the population;
- develops and implements state programs in the field of prevention of micronutrient deficiency among the population;
- determines the list of food products to be enriched with micronutrients;
- organizes and ensures performance of works in the field of technical regulation concerning mandatory requirements for the safety of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- determines the target population groups, which are subject to the introduction of micronutrients;
- develops norms and recommended levels of micronutrient content for the enrichment of food products;
- organizes the supplementation by micronutrients;
- conducts sanitary and hygienic and explanatory work on the prevention of micronutrient deficiency among the population;
- monitors and assesses the implementation of programs aimed at the prevention of micronutrient deficiency among the population.

The Uzbek Agency for Standardization, Metrology and Certification:

- performs state control over compliance by legal entities with mandatory requirements of regulatory documents in the field of technical regulation in the production of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- organizes work on mandatory certification of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products.

5.7 State policy in the field of sanitary and epidemiological welfare of the population

The main directions of state policy in the field of sanitary and epidemiological welfare of the population are:

- development and implementation of sanitary-hygienic and anti-epidemic measures;
- state sanitary and epidemiological regulation;
- increasing the level of sanitary culture of the population;
- implementation of state sanitary supervision;
- international cooperation.

The state sanitary supervision is carried out by the Republican Center of State Sanitary and Epidemiological Supervision of the Ministry of Health of the Republic of Uzbekistan, the centers of state sanitary and epidemiological surveillance of the Republic of Karakalpakstan, oblasts and the city of Tashkent, districts and cities.

The Republican Center for State Sanitary and Epidemiological Supervision of the Ministry of Health of the Republic of Uzbekistan, the centers for state sanitary and epidemiological surveillance of the Republic of Karakalpakstan, the provinces and the city of Tashkent provide methodological guidance and coordination of the activities of the relevant units (bodies).

Chief State Sanitary Doctor of the Republic of Uzbekistan:

- directs the sanitary and epidemiological service, defines the main tasks and priorities for the implementation of state sanitary supervision;
- approves sanitary rules, norms and hygienic standards;
- approves normative and technical documentation for determining the influence of environmental factors on the human body;
- approves the National calendar of preventive vaccinations and the procedure for carrying out preventive vaccinations for epidemiological indications;
- Identifies areas that are hazardous to human life and health, which prohibit the residence of people and the occupation of economic activities;
- coordinates the measures for the sanitary protection of the territories from the introduction and spread of infectious and parasitic diseases;
- at the threat of the emergence and spread of infectious and parasitic diseases that pose a danger to others, makes decisions on the conduct of appropriate sanitary and hygienic and anti-epidemic measures;
- issues permits for import into the Republic of Uzbekistan and production of new food additives, specially introduced biologically active substances, chemicals, biological agents and materials, polymeric and plastic masses, perfumery and cosmetic products on the basis of their toxicological and hygienic evaluation;

Legal entities and individual entrepreneurs engaged in the production, transportation, storage and sale of food raw materials, food products are obliged to comply with sanitary rules, norms and hygienic standards. Import to the Republic of Uzbekistan and production of new food additives, specially introduced biologically active substances is allowed only after toxicological

and hygienic assessment with the permission of the Chief State Sanitary Doctor of the Republic of Uzbekistan.

Legal entities that carry out activities in the sphere of domestic and drinking water supply are obliged to ensure that the quality of supplied water meets the sanitary rules, norms and hygienic standards, as well as state standards. Sanitary protection zones with a special regime are established for centralized drinking-water supply pipelines and their sources, which are approved by local state authorities. Legal entities and individuals are obliged to ensure the compliance of water in water bodies used for domestic and non-centralized water supply, sanitary rules, norms and hygienic standards.

5.8 Technical regulation for the safety of products, works and services

The state system of technical regulation is composed by: the Cabinet of Ministers of the Republic of Uzbekistan; The Uzbek Agency for Standardization, Metrology and Certification, the Ministry of Health of the Republic of Uzbekistan, the State Committee of the Republic of Uzbekistan for Architecture and Construction, the State Committee of the Republic of Uzbekistan on Ecology and Environmental Protection; bodies of state and economic management, carrying out activities within their competence in the field of technical regulation.

The Uzbek Agency for Standardization, Metrology and Certification:

- develops provides proposals to the Cabinet of Ministers of the Republic of Uzbekistan on draft programs for the development of technical regulations introduced by authorized state bodies in the field of technical regulation and state and economic management bodies;
- coordinates and organizes the activities of state and economic management bodies in the development of general and special technical regulations;
- makes proposals to the Cabinet of Ministers of the Republic of Uzbekistan on approval of general technical regulations, on amendments and additions thereto, and on the abolition of these regulations;
- creates an expert commission in the field of technical regulation;
- conducts an examination of general and special technical regulations developed by state and economic management bodies;
- approves special technical regulations developed by the economic management bodies, introduces changes and additions to them, and also repeals these regulations;
- approves the list of normative documents in the field of technical regulation that determine the methods for sampling, testing and measuring the products required to assess the conformity of products and services with the requirements established in technical regulations;
- within its competence, exercises state control over observance of general and special technical regulations;
- forms the state fund of normative documents in the field of technical regulation;

- carries out international cooperation in the field of technical regulation.

The requirements for ensuring the safety of products and services in technical regulations are established by (among others):

- biological safety;
- mechanical safety;
- chemical safety;
- ecological safety;
- veterinary safety;
- industrial and industrial safety;
- information security;
- ensuring the uniformity of measurements and test methods.

5.9 Health protection of population in Uzbekistan

The main principles of protecting citizens' health are:

- observance of human rights in the field of health protection;
- availability of medical care for all segments of the population;
- priority of preventive measures;
- social security of citizens in case of loss of health;
- the unity of medical science and practice.

According to the law on health protection of population in Uzbekistan, the state provides citizens with health protection regardless of age, sex, race, nationality, language, attitude to religion, social origin, beliefs, personal and social status. The state guarantees citizens protection from discrimination, regardless of whether they have any form of disease. Citizens have the right to receive reliable and timely information on factors that affect the health status, including information on the sanitary and epidemiological well-being of the territory of residence, rational nutrition standards, on goods, works, services, their safety, compliance with sanitary norms and rules.

6. Challenges to Food and Nutrition Security

6.1 Summary of external and internal factors on FSN

Respondents of the expert interview identified factors having most impact on food security in Uzbekistan, including: degradation of natural resources, population growth, climate change, globalization trends (changes in consumers preferences), other factors (Table 9). As can be seen from the table, most of the respondents agree that degradation of natural resources, population growth and climate change have or will have in the future a strong impact on FSN in Uzbekistan, whereas globalization trends like changes in consumer preferences, dietary habits were not considered important or having direct impact on FSN in Uzbekistan.

Table 9. Factors impacting FSN in Uzbekistan

Factor	Description / supporting argumentation
Degradation of natural resources	<ul style="list-style-type: none"> – a serious factor (salinity, drought in certain years), political disputes (debates about transboundary waters); – an ongoing trend in the development of intensification of agriculture will lead to further degradation of ecosystems and natural resources; – deterioration of the ecology, soil, air ... – yes, especially under the conditions of climate change; – a strong impact: if we do not take significant measures in the near future
Population growth	<ul style="list-style-type: none"> – there is a pressure on land and water resources as a result of land degradation. The situation may get worse over time. – this implies an increase in food production. Diversification of agricultural production is a rational solution for the development and ensuring of food security; – forces to produce cheap, but not very useful products – due to increased food consumption; – significant impact: direct influence taking into account the health of the younger generation.
Climate change	<ul style="list-style-type: none"> – uncertainty and instability of access to water – under the harsh natural and climatic conditions of Uzbekistan, the energy-intensive and high-carbon economy will contribute to the difficulty of solving the tasks of ensuring food security – shortage of water resources, seasonal temperature fluctuations – the increase in temperature put limits on the availability and use of land and water resources; – significant impact: in this regard, it is necessary to switch to resource-saving technologies
Globalization trends (changes in consumer preferences)	<ul style="list-style-type: none"> – rapidly opening external markets (neighboring countries, etc.) impact pricing of food products, leading to more expensive costs for consumers; – change in consumer preferences is always associated with a change of tradition and high costs and, as a rule, with great pressure on natural resources. As a rule, the economy suffers from this, but external forces profit by promoting the idea of globalization. – increase in domestic food prices due to exports and imports of products – not really, given the meeting of domestic demand for food. – indirect impact: due to changes in supply and demand. – very important for risk diversification
Other	<ul style="list-style-type: none"> – it is necessary to conduct a large amount of work directly with producers of agricultural products. – keep the traditions and move towards innovation (unconventional standards). – training of necessary personnel for solving problems in the field of food security.

6.2 Land degradation/Soil salinization

Land degradation in all Central Asian countries, and the more so in Uzbekistan, has negative implications on rural livelihoods and food security. Uzbekistan. Land degradation occurs in many agro-ecological zones of Uzbekistan, leading to negative consequences on crop and livestock production, agricultural incomes, and rural livelihoods (Pender et al. 2009). The major types of land degradation in Uzbekistan are secondary salinization, soil erosion and desertification.

The drivers of land degradation in the region are numerous, highly complex and interrelated (Pender et al. 2009). The major causes often mentioned include unsustainable agricultural practices, the expansion of crop production to fragile and marginal areas, inadequate maintenance of irrigation and drainage networks, and overgrazing near settlements (Mirzabaev A., et.al., 2016).

The estimates by Mirzabaev et.al. (2016) show that the annual cost of land degradation in Central Asian region due to land use change is about USD 6 billion, due to rangeland degradation (4.6 billion USD), followed by desertification (0.8 billion USD), deforestation (0.3 billion USD) and abandonment of croplands (0.1 billion USD). A. Aw-Hassan et al. (2016) estimated the costs of land degradation in Uzbekistan as substantial; reaching about USD 0.85 billion annually and resulting from the loss of valuable land ecosystem services due to land use and land cover changes.

In the irrigated cropland areas of Uzbekistan, secondary salinization of soil is a major problem, varying to different degrees of soil salinity in the country, from 53% in the valley to 90–94% of the irrigated lands in Karakalpakstan, Khorezm and Bukhara provinces of Uzbekistan (A. Aw-Hassan et al. 2016). Each year, waterlogging and salinization result in a loss of about 30,000 ha of land in Uzbekistan (Pender et al. 2009).

The major cause of secondary soil salinization is inappropriate irrigation practices. The presence of shallow groundwater tables is another major factor contributing to the salinization of irrigated lands. This leads to wide spread waterlogging and salinity problems.

Farmers usually try to address salinity by leaching the soil. However, the use of increasingly saline irrigation water undermines the effectiveness of leaching, and adds to the problem of excessive water use (Pender et al. 2009).

6.3 Options for combating land degradation and soil salinization

Land amelioration describes activities (hydrological, soil, agroclimatic) aimed at improvement of land and increase in fertility level. Amelioration activities differ from other agricultural practices by a longer and more intense character. Land amelioration is applied to low-quality, low-productive land.

Land rehabilitation is the process of returning the degraded and abandoned land in a given area to some degree of its former state, after some process (industry, mining, intensive agricultural production, deforestation, natural disasters, etc.) has resulted in its damage.

In terms of agriculture, land improvement through amelioration and rehabilitation includes:

- Hydrological improvement (land, drainage, irrigation, leaching of saline soils, landslide and flood control);
- Soil improvement (fertilization, establishment of proper chemical balance, proper crop rotation, introduction of halophytic and N accumulating plants);
- Soil stabilization/erosion control;
- Road construction;

- Afforestation, as a means for water conservation, land protection against wind erosion (shelterbelts), slowing down the secondary salt accumulation dynamics, restoration of soil fertility given the right tree species are planted.

The choice of land improvement strategy and intensity depends on the climatic and economic conditions of the area. Generally a complex of land amelioration practices has to be applied for achieving better and most importantly sustainable results. Massive land amelioration without proper consideration of ecological and geological consequences may lead to disastrous results.

Uzbekistan was one of the first countries (13th out of the 193 members) to sign the Convention to Combat Desertification and drought on the December 7th, 1994. The Uzbek Parliament (Oliy Majlis) has ratified it on the August 31st, 1995. Furthermore, Uzbekistan had adopted a national action program to combat desertification in 1999. The program identified the country's main priorities in the implementation of the UNCCD and a number of measures that would ensure success of the containment of the desertification processes, land degradation and drought prevention. Establishing of the observation and control system by using modern methods of monitoring desertification and drought was one such measure. Specialists under special grants and participants in the international projects are studying desertification processes and assessing their impact on the environment but this work is not permanent and is rather sporadic. Unfortunately, to this day there is no State monitoring system, although as mentioned above, it should one of the State priorities.

At present, a number of Ministries and State Departments are independently monitoring and evaluating desertification processes. And each organization has certain obligations under one or the other monitoring concept each of them is responsible for.

The Government of Uzbekistan has determined land degradation as a high priority area for development of the country and established a special Fund for Ameliorative Improvement of the Irrigated Land. This Fund is the state body accumulating target financial resources, allocated for improvement of ameliorative condition of irrigated agricultural lands. Likewise, in the five year-period (2008-2013) the fund has allocated around 800 billion UZS for hydrological constructions; for reconstruction of the magistral, secondary and tertiary canals on the area of 3.5 thousand ha; for renovation of 7.6 thousand km of drainage network; for disseminating water saving technologies among agricultural producers (State Committee of Uzbekistan on Nature Protection, 2013). As a result about 1,200 thousand ha of degraded land has been rehabilitated throughout the country.

According to the Decree of the President of Uzbekistan №ПП-2099 from 25th of December, 2013, Amelioration Fund for the year 2014 was granted 272.1 billion UZS for hydrological construction, renovation and infrastructure rehabilitation, for purchasing of new amelioration equipment, for dissemination of drip irrigation technology.

Currently, the government has planned to rehabilitate 10,000–15,000 ha of abandoned land annually through reconstruction of irrigation and drainage infrastructure, and promoting more sustainable agricultural practices. The government of Uzbekistan is planning to allocate more

than 1 billion USD for maintenance and modernization of the irrigation and drainage system in the country till 2020. The construction and improvement of irrigation and drainage facilities is estimated to cost USD 2000 per ha. This approach will require massive financial and technical support from government as individual farmers are unable to bear these costs. In addition to this, there are also cost-effective interventions that can be undertaken by farmers to compliment state efforts in mitigating salinization problems (A. Aw-Hassan et al., 2016).

On the farmer side, current amelioration practices of salt-affected land include high water-consumptive leaching, intensive drainage, that result in significant return flows to the Syrdarya and Amudarya river channels thereby affecting water quality in the lower reaches of the river systems. Increasing shortages of water challenge the continuation of these practices. As a result, salt-affected lands either remain low productive or farmers abandon them, which negatively affects rural livelihoods further. An alternative strategy for reclaiming salt-affected soils (and also suitable for farmers) may be associated with the cultivation of salt-tolerant crops and drought tolerant species with a deep rooting system, such as *Licorice* or salt tolerant alfalfa varieties.

It seems that a lot is being done in the country towards land improvement. However, these land reclamation strategies are very capital intensive and will require further financial support.

6.4 Irrigation related challenges

Due to the arid climate, agricultural production in most of Uzbekistan is possible only with irrigation. The water delivery system for irrigation is basically sound at the macro level, although parts of it need upgrading and renewal. Most of the land is irrigated through surface or furrow irrigation procedures, which are cheap to install and operate but inefficient in terms of water use. This matters because of the overall scarcity of irrigation water, most of it being obtained from river flows originating outside Uzbek territory.

However, excessive irrigation through poorly constructed and maintained irrigation systems are the main proximate causes of soil salinization. Drainage systems add to the problem as they fail to drain off the excess water and salts, due to their inappropriate construction and maintenance (ADB 2007).

With reference to technical aspects only, current problems with the water management system in Uzbekistan are mainly caused by: (1) inflexible irrigation scheduling, (2) low efficiencies of water application at field and network level, (3) inappropriate infrastructure and insufficient maintenance, (4) limited options for groundwater management and (5) a general lack of input data to support water management. These factors are therefore starting points for interventions towards an improvement of water use. Such measures include among others the advanced determination of net irrigation needs taking the temporal behavior and site-specific dependencies of the field water balance into account, the optimization of the field water application process, and raising network efficiency. Together, these interventions have a water-saving potential of 50% relative to the current water withdrawal from the river (Tischbein B. et.al. 2012).

6.5 Climate change challenges

Agricultural production in Uzbekistan is highly vulnerable in times of climate change, as water supply for irrigation depends to 90% on transboundary rivers. Furthermore, climate change in Uzbekistan is projected to lead to higher temperatures (between 2°C and 3°C over the next 50 years) and changes in precipitation patterns. It is likely to cause yield reductions of 20–50% by 2050 for nearly all crops; and there will be a severe water shortage.

With regards to water availability, the projections for Uzbekistan for the period from 2005 to 2050 indicate that: (i) water supply will decrease from 57 billion m³ to 52–54 billion m³, (ii) water demand will increase from 59 billion m³ to 62–63 billion m³, and (iii) the water deficit will increase by more than 500% from about 2 billion m³ to 11–13 billion m³ (World Bank, 2010).

In more detail, the runoff patterns are likely to change as to that in spring higher amounts of runoff will be observed, while from May to August less runoff, although highly needed, will be available. The Amu Darya River Basin and small water currents are extremely vulnerable to climate change. It is expected that the water flow will potentially decrease by 25% in the Syr Darya River Basin and by 10-15% in the Amu Darya River Basin by 2050. During the years of acute water scarcity (assessment for extremely warm and dry years), vegetation flow in the Syr Darya and Amu Darya Rivers Basins might decrease by 25-50% (Christmann, S., et.al. 2009).

According to Christmann, S., et.al. (2009), Uzbekistan has two important assets to cope with the challenges set by climate change:

- (1) The country has always been a hotspot of biodiversity concerning crop plants and successfully kept a high number of varieties over decades (total 124 agricultural crop species and 952 varieties/hybrids; e.g. 39 species and 389 varieties of vegetable crops and melons; 22 species and 204 varieties of fruit and berry crops; 5 species and 52 varieties of industrial crops; 14 species and 129 varieties of grain crops);
- (2) Agricultural research has a long tradition and a high standard in Uzbekistan. Specifically in this decade, a lot of promising research findings has been published to adapt to climate change. There are numerous remarkable research institutions in Uzbekistan, e.g. Uzbek Cotton Research Institute, Uzbek Research Institute of Vegetable, Melon Crops and Potato, Uzbek Research Institute of Horticulture, Uzbek Soil Science Institute, Central Asian Research Institute of Irrigation and Drainage (SANIIRI), Uzbek Research Institute of Karakul Sheep Breeding and Ecology of Deserts, Tashkent Institute for Irrigation and Melioration, Andijan University, and the former ZEF/UNESCO Khorezm project at Urgench State University. The Uzbek government initiated activities towards crop diversification: The area of cotton plantations has been significantly reduced towards an increase of vegetables and legumes in order to reach higher food security.

6.6 Population growth

Rapidly growing population especially in rural areas exerts an increasing pressure on available agricultural land resources. Continuing degradation of the agro-ecosystems further

enhanced by extremes of drought and wet periods due to climate change-related uncertainty render these resources and rural communities even more vulnerable. At the same time arresting land degradation, utilization of marginal land for crop production or grazing has a high potential of reducing the pressure on highly productive land, fighting poverty and enhancing production potential. E.g., producing crops traditionally grown on irrigated areas (fodder, grains, vegetables, etc) or introducing alternative crops (indigo, licorice, etc) on marginal land has a potential to achieve additional food or fodder, enhance food security, receive additional income and hence, provide better livelihoods of rural population, while decreasing dependence on imports. At the same time failure to address poor productivity of the marginal land will result in further land degradation, underproduction of food, increased poverty and thus, social insecurity, inequality and instability.

6.7 Export of foodstuff

There has been a recent surge in investment in intensive horticultural production of both fruit and vegetables. The Government set clear priorities for development of the subsector in Presidential Decree No. 2460 dated 29 December, 2015. Support for this initiative has mobilized public (including major donors) and private investment to shift out of lower-value wheat and cotton and into horticulture, mainly with an export focus. More than 25,000 ha of new fruit orchards have been established over the past four years. However, the horticulture subsector is still constrained by limited access to quality land, specialized horticulture machinery, appropriate inputs, and, in particular, finance.

On the other hand, the plans of the Government to increase export of fruits and vegetables can induce shortage of foodstuff at local markets and increase in prices – i.e. deteriorate availability and accessibility parameters for food security in Uzbekistan. Another negative impact of a drastic export increase would be deterioration of quality of locally available foodstuff (the best fruits and vegetables would be exported).

6.8 FSN SWOT analysis

The following Table 10 provides experts' view on strengths, weaknesses, opportunities and threats to food and nutrition security in Uzbekistan.

Table 10. FSN SWOT analysis

Internal environment	External environment
<p>Strengths:</p> <ol style="list-style-type: none"> 1. Sufficient legislative base in the context of FSN (Annex 5); 2. Strong support from the Government; 3. Hard working population (sufficient labor force); 4. Sufficient reserves of natural resources; 5. Favorable soil and climate conditions; 6. Support for organic production; 7. Developed food industry; 8. Developing logistics; 9. Per capita increase in production of food products; 10. Investments in agriculture and food industry; 11. Range of food products produced in the country; 12. High requirements to the quality and safety of food products. 	<p>Opportunities:</p> <ol style="list-style-type: none"> 1. Development of technical regulations for accession to WTO and the Customs Union; 2. Entering foreign markets for export development; 3. Study of international requirements for the export of food products; 4. Obtaining international quality certificates; 5. Propagation of healthy nutrition among the population; 6. Improvement of national trade brands; 7. Development of logistics; 8. Expansion of trade.
<p>Weaknesses:</p> <ol style="list-style-type: none"> 1. Degradation of natural resources (soil, water, air); 2. Slow introduction/adoption of resource-saving technologies; 3. Low level of scientific achievements; 4. Insufficient investments in agricultural research; 5. Brain drain from the country and from the food industry; 6. Lack of competent personnel in agriculture and agrarian science; 7. Insufficient quality of produced food products; 8. Insufficient quality control of food production processes at all stages of production; 9. Weak regulation of prices for food products; 10. Weak marketing, insufficient research of consumers and their preferences; 11. Low awareness of the population about the rational balanced diet; 12. Low awareness of the population about the quality of food products. 13. Cumbersome procedure of establishment of a new business entity in the industry and instability of the legislative base and licensing procedures (doing business, accounting, finance, etc.) 14. Weak infrastructure, difficult access to electricity grid, water supply, 	<p>Threats:</p> <ol style="list-style-type: none"> 1. Dependence on climatic conditions, global climate change; 2. Degradation of natural resources (soil, water, air); 3. Population growth; 4. Instability of prices for food products (including in the world market); 5. Threat of pest invasion and diseases (for agricultural production); 6. Biologically invasive species; 7. Man-made threats.

etc., lack of machinery and mechanisms, equipment.	
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7. The Existing FSN Policy Framework

7.1 The definition of national food security concept and its measurement

The concept of food security is relatively new and hardly recognized in Uzbekistan. Often this concept reflects agricultural development rather than being used as part of human security agenda. However, this concept should be one of the key notions on the political agenda of Uzbekistan. One of the reasons is that globalization process in trade dictates conditions and standards of marketing, which challenge Uzbekistan in exporting and importing food stocks.

At the moment there is no official definition of the "food security" concept in Uzbekistan. When developing programs/activities for food security, state authorities refer to an international definition of the "food security" concept (for example, by FAO). Currently the national concept of "food security" is being coined within the process of the development of the Law "On Food Security". Once the Law is adopted it will be possible to compare the international and national concepts of food security. Also, no clear criteria and indicators for assessing the state of food security have been developed yet. The above-mentioned Law "On Food Security" will identify and define criteria and indicators for assessing food security.

7.2 The public perception of food security

According to the results of the research carried out by the Center for Economic Research (CER)¹¹ in 2013, the majority of the population, mainly residing in the regions of the Republic, has some idea and insight about food security. In general, the public perception is primarily focused on the level of food prices, i.e. on its economic accessibility, but not on the quality of the structure and volume of consumption. As a rule, most people of the country with low level of average income are less focused on the healthy nutrition issues.

7.3 Policy- and decision-makers in the field of food security

The discussion with experts and analysis of the past and current legislation revealed that the main institutions responsible for the development and implementation of food security policies are:

1. Parliament (Oliy Majlis) of the Republic of Uzbekistan, which provides the legislative base for policies in the form of Laws and the subsequent adoption of legal acts in the field of food security. The Parliament has adopted several key laws, which define concepts related to food security and determine state policy in this field.
2. The executive power, represented by the President and the Cabinet of Ministers of the Republic of Uzbekistan, determines main policy vectors and the latter institution is directly engaged with the implementation of adopted decisions. The Cabinet of Ministers (Government) consists of ministries and state agencies as well as economic entities with state share. The main organizations that put in effect the policy in the field of food security are:

¹¹ CER Report "The main directions of food security policy in Uzbekistan", 2013.

- *Ministry of Agriculture* – coordinates policy in land use and crop production;
- *Ministry of Health* – responsible for policy in healthy nutrition;
- *Ministry of Economy* – determines national balance of foodstuffs production;
- *Agency “Uzstandart”* – supervises implementation of the standards and issues certificates on the food products;
- *Holding company HC «Uzbekoziqovqatholding»* – incorporates all enterprises in food processing sector and directly controls the quantity and quality of production.

7.4 Current FSN legislative base¹²

The Law “On Quality and Safety of Food Products”

Legislative regulation of the food security issues began in 1997 with the adoption of the Law “On Quality and Safety of Food Products”. This Law has set the legal framework for providing the population with quality and safe food products. It has defined for the first time the following key basic concepts: food safety, quality of food products, expiry date of food products, and falsification of food products.

The Law also outlines the role and scope of the state policy in the field of ensuring the quality and safety of the food products as follows:

- *State regulation*: establishment of sanitary, veterinary, sanitary, and other rules, norms and standards, which determine requirements for quality and safety of food products, the conditions of its production, procurement, purchase, processing, supply, storage, transportation and sale;
- *State registration of food products and equipment intended for its production and use in contact with food*: food products, as well as equipment intended for its production and use in contact with food, can be produced, imported, implemented and applied after assessing their compliance with the requirements of norms and regulations on the quality and safety of food products and their state registration;
- *Certification of food products*: food products, technologies, equipment, products and facilities intended for its production, storage, transportation and trade are subject to certification in order to confirm their compliance with norms and rules. The list of products, subject to mandatory certification and the procedure for conducting certification, is determined further by the government;
- *State supervision and control*: supervision and control over the quality and safety of food products is carried out by the state supervision bodies specified by the Law, within their competence;
- *Planning activities to ensure the quality and safety of food*: republican and regional target programs for the development of food production and trade should consider specific measures to ensure the quality and safety of food products.

¹² For the list of legislative acts in the sphere of FSN in Uzbekistan please refer to Annexes 1 and 2.

This Law imposes certain rules and limits on the whole food cycle, starting from the development of new food products and ending with the sale to final consumers. It sets requirements and conditions to the processes of development and production of new food products, manufacture, packaging and labeling, storage and transportation, sale, and import of food products. Producers and traders of the food products must comply with the above-mentioned requirements, and various punishment measures are specified in case of the violation of this Law.

The Law "On Prevention of Iodine Deficiency Diseases"

In addition to the regulation of the production aspects of the food security, two specific laws were adopted to address health aspects of the food security policy.

The Law "*On Prevention of Iodine Deficiency Diseases*" (2007) establishes legal framework for the measures on prevention of iodine deficiency diseases. The Law defines the concepts of iodine deficiency diseases, prevention of iodine deficiency diseases, iodinated foods, and of iodized salt.

The state policy in the field of prevention of iodine deficiency diseases is aimed at preventing the occurrence of iodine deficiency diseases and is implemented by, among others, the following:

- Implementation of economic, legal and organizational measures aimed at saturation of the consumer market with iodized salt and iodized food products;
- Implementation of state control over the quality and safety of iodized salt and iodized food products;
- State support of scientific research in the field of prevention of iodine deficiency diseases;
- Implementation of measures for the preventive maintenance of children and women of reproductive age with iodine-containing preparations;
- State support for the production of iodized salt and iodinated foods, and drugs used for the prevention and treatment of iodine deficiency disorders.

Specifically, the Law stipulates that food salt produced and sold in Uzbekistan is subject to mandatory iodization. Also, certain food products are subject to iodization in the order, determined by the Ministry of Health.

The Law "On Prevention of Micronutrient Deficiency among the Population"

The Law "*On Prevention of Micronutrient Deficiency among the Population*" defines and outlines measures to prevent micronutrient deficiency among people of Uzbekistan. The Law gives definition to the concepts of micronutrients, micronutrient deficiency, enriched food products, supplementation with micronutrients, and target groups of the population.

The role of State in this sphere involves, among others, the following:

- Coordination of the activities of government bodies, as well as producers of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- Implementation of state control over the quality and safety of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products;
- Organization of preventive and sanitary-epidemiological measures.

Preventive measures are aimed at identification of the need for and ensuring the consumption of enriched food products, supplementation of micronutrients, hygienic and advocacy work.

Enriched food products and vitamin-mineral mixtures intended for the enrichment of food products are subject to mandatory certification.

Non-commercial advertising aimed at the prevention of micronutrient deficiency is considered as social advertising information, and such advertising is distributed or broadcasted free of charge.

The draft of the Law “On Food Security”

The President adopted the first legal document that specifically addresses the issues of food security in January of 2018 - “On Measures for Further Provision of the Food Security of the Country”. This legal act sets specific measures to further ensure the country's food security, market saturation with high-quality, safe and affordable food products, and strengthen the purchasing power of the population. The legal act specifically stipulates that the draft of the Law "On Food Security" should be developed, containing measures to saturate the market with high-quality, safe and affordable food products, development of the agricultural complex, the introduction of effective mechanisms for social and public-private partnerships, timely elimination of threats to the stability of the food market, flexible customs and tariff regulation of food imports. As mentioned above, the Law "On Food Security" will officially define the concept of the food security for the first time in the country. This Law is expected to be adopted by Parliament later in 2018.

Legal acts

The President and the Government of Uzbekistan have adopted numerous legal acts concerning food policy directly and indirectly for the last 3 years. These legal acts encompass a wide spectre of issues ranging from institutional aspects to specific ones related to health nutrition. For example, the Government adopted a legal act "On Further Improvement of Implemented Measures in the Field of Healthy Nutrition of the Population of the Republic of Uzbekistan" in 2015, which defines and determines state policy to promote healthy nutrition as follows:

- Organization of wide explanatory work and strengthening of the propaganda for healthy nutrition as a basis for a healthy lifestyle of the population, including the active use of mass media;

- Development of educational programs for various groups of the population on healthy nutrition, aimed at reducing the prevalence of diseases associated with nutrition, the priority development of basic research in the field of healthy nutrition;
- Improvement of nutrition in organized collectives, provision of adequate nutrition to pregnant and lactating women, as well as children under 3 years of age, improvement of dietary (curative and preventive) nutrition in medical and preventive institutions, as an integral part of the medical treatment process;
- Expansion of domestic production of basic types of food raw materials in accordance with modern requirements for quality and safety, development of production of food products enriched with essential components, specialized products for baby food, dietary (curative and preventive) foods and biologically active food additives;
- Development and adoption of technical regulations and national standards related to food products and food raw materials;
- Improvement of quality control mechanisms for food products and foodstuffs produced in the territory of Uzbekistan and foodstuffs imported from abroad, strengthening of the producer's legal responsibility for the production of non-conforming and falsified food products.

The National Program “On further development of raw materials base, advanced processing of fruit and vegetable, and meat and dairy products, and increase in production and export of food products for 2016-2020”

In the beginning of 2016 the Government approved the Program “On further development of raw materials base, advanced processing of fruit and vegetable, and meat and dairy products, and increase in production and export of food products for 2016-2020”. The Program has set targets for and forecasted parameters of the:

- Production of the main types of agricultural products for the development of the raw materials base of the food industry;
- List of investment projects for the construction of new, reconstruction and modernization of existing enterprises for deeper processing of agricultural products, production of semi-finished products and finished food products, as well as packaging materials;
- Construction of new enterprises for processing and production of horticultural, meat and dairy and other food products;
- Construction of new modern refrigerating chambers for storage of agricultural products;
- Production of semi-finished products for the food industry;
- Production of finished food products;
- Supply of fresh and processed fruit and vegetable products for export.

Table 11. Main laws and programs related to food security and nutrition in Uzbekistan

Name of the Policy/Program	Name of the Implementing Body	Main Objective	Implementation Period
Law “On Quality and Safety of Food Products”, 30.08.1997	Ministry of Health, State Veterinary Committee, Ministry of Agriculture, Agency “UzStandard”	Provision of legal framework for providing the population with quality and safe food products via: Establishment of sanitary, veterinary, sanitary, and other rules, norms and standards, which determine requirements for quality and safety of food products, the conditions of its production, procurement, purchase, processing, supply, storage, transportation and sale.	1997 – to date
Law “On Prevention of Iodine Deficiency Diseases”, 03.05.2007	Ministry of Health, Agency “UzStandard”, local state authorities	Provision of legal framework for the measures on prevention of iodine deficiency diseases: <ul style="list-style-type: none"> • saturation of the consumer market with iodized salt and iodized food products; • control over the quality and safety of iodized salt and iodized food products; • Implementation of measures for the preventive maintenance of children and women of reproductive age with iodine-containing preparations; • state support for the production of iodized salt and iodinated foods, and drugs used for the prevention and treatment of iodine deficiency disorders. 	2007 – to date
Law “On Prevention of Micronutrient Deficiency Among the Population”, 07.06.2010	Ministry of Health, Agency “UzStandard”, local state authorities	Regulation of measures to prevent micronutrient deficiency among people of Uzbekistan via: <ul style="list-style-type: none"> • coordination of the activities of government bodies, as well as producers of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products; • implementation of state control over the quality and safety of enriched food products and vitamin-mineral mixtures intended for the enrichment of food products; • organization of preventive and sanitary-epidemiological measures. 	2010 – to date

<p>Cabinet of Ministers' Resolution #102 "On Further Improvement of Implemented Measures in the Field of Healthy Nutrition of the Population of the Republic of Uzbekistan", 25.04.2015</p>	<p>Cabinet of Ministers, Ministry of Health</p>	<p>Improvement of the implemented measures in the field of healthy nutrition aimed at preserving and strengthening the health of the population, preventing diseases, and creating, in accordance with the requirements of medical science, conditions that meet the needs of different groups of the population in healthy nutrition.</p>	<p>2015 – to date</p>
<p>Cabinet of Ministers' Resolution #251 "On the Approval of the Concept and Set of Measures for the Provision of Healthy Nutrition for the Population of the Republic of Uzbekistan for the Period of 2015 - 2020 Years", 29.08.2015</p>	<p>Cabinet of Ministers, Ministry of Health</p>	<p>The Concept main objectives are:</p> <ul style="list-style-type: none"> • prevention and reduction of the prevalence of diseases associated with malnutrition, the organization of broad explanatory work and the promotion of healthy nutrition, as the basis for a healthy lifestyle of the population; • improvement of the diet of kindergarderns, the introduction of effective quality control mechanisms over food products and food raw materials produced in the territory of the Republic of Uzbekistan and shipped from overseas; • encouragement of domestic production of food products, especially products rich in essential micronutrients, creation of food products based on local raw materials, the formation of an environment conducive to the implementation of the principles of healthy nutrition among the population. 	<p>2015 – 2020</p>
<p>President's Resolution #2492 "On Measures for the Further Improvement of the Organization of the Food Industry of the Republic", 18.02.2016</p>	<p>Cabinet of Ministers</p>	<p>The establishment of the holding company "UzbekOzikOvkatHolding", which unites all enterprises for the production of food products in Uzbekistan.</p>	<p>2016 – to date</p>
<p>President's Resolution #2505 "On Measures for the Further Development of the Raw Base, Deepening the Processing of Fruit and Vegetable, and Meat and</p>	<p>Cabinet of Ministers</p>	<p>Expansion of the range and increase the production and export of high-quality competitive foodstuffs with high added value on the basis of accelerated development of the raw material base, construction of new and modernization of existing production</p>	<p>2016 – 2020</p>

Dairy Products, Increasing the Production and Export of Food Products in 2016-2020”, 05.03.2016		facilities, attraction of foreign investments for deeper processing of agricultural raw materials, establishment of modern trade and logistics centers and refrigerator capacities for storage and processing of fruits and vegetables.	
President’s Resolution #2515 “On the establishment of the specialized foreign trade company for the export of fresh and processed fruit and vegetable products “Uzagroexport”, 25.04.2016	Cabinet of Ministers, HC "UzbekOzikOvkat Holding"	Establishment of the specialized foreign trade company of JSC "Uzagroexport" for the export of fresh and processed products within the HC "UzbekOzikOvkatHolding".	2016 – to date
Sanitary Rules and Norms #0344-17 “Production of Fruit and Vegetable Canned Food, Dried Fruit, Vegetables and Potatoes, Sauerkraut and Salted Vegetables”, 03.02.2017	Ministry of Health	The main objective of these sanitary rules is sanitary and epidemiological regulation to ensure high quality and safety of fruit and vegetable products to establish sanitary and epidemiological requirements for the placement, arrangement, planning, sanitary and technical condition of enterprises, engaged in the production of canned fruits and vegetables, as well as labor conditions for their production.	2017 – to date
Sanitary Rules and Norms #0347-17 “Physiological norms of micronutrient and energy requirements for various population groups of Uzbekistan based on gender, age and profession for sustaining healthy nutrition”. Introduced by the Decree #4 of the main state doctor of Uzbekistan, 22.03.2017	Ministry of Health	Establishment of medical criteria aimed at ensuring healthy nutrition in the determination of the average daily recommended consumption of food for various organized groups of population; The analysis and evaluation of diets and conducting research in the field of assessment and planning of nutrition for the population of different sex and age groups of the population of Uzbekistan.	2017 – to date
President’s Resolution #3082 “On Immediate Measures for the Reliable Provision of the Population of the Republic with the	Cabinet of Ministers	Establishment of the Republican Commission for monitoring and control of the prices for the main types of socially significant foodstuffs; Establishment of the Fund for the promotion of price	2017 – to date

Main Types of Socially Significant Food Products”, 23.06.2017		stabilization in the domestic consumer market; Systematic control over the prevention of artificial price increase and misuse of the Fund's allocated resources with the adoption of strict measures against the perpetrators.	
President's Resolution #3077 “On Measures for Further Support of Domestic Exporting Organizations and Improvement of Foreign Economic Activity”, 21.06.2017	Cabinet of Ministers	Business entities are allowed to export fresh fruits, vegetables, grapes and melons on the basis of direct contracts on the condition of a 100% advance payment.	01.07.2017 – to date
Cabinet of Ministers' Resolution #490 “On Approval of the General Technical Regulations on the Safety of Food Products in the Terms of its Labeling”, 12.07.2017	Cabinet of Ministers, Agency “UzStandard”, HC "UzbekOzikOvkat Holding"	This General Technical Regulation establishes requirements for food products in terms of its labeling in order to ensure the enforcement of the rights of customers to access reliable information about food products.	01.07.2018 – to date
President's Resolution #3303 “On Measures on Further Regulation of the Foreign Economic Activity of the Republic of Uzbekistan”, 29.09.2017	Cabinet of Ministers, State Customs Committee	Saturation of the domestic market with quality and affordable food products via abolishment and decrease of customs duties and fees for certain list of imported food items: <ul style="list-style-type: none"> • the import of fish and sea products (fresh, frozen, dried, etc., except for live fish), livestock, cattle meat, sheep and goat meat, milk, potato, wheat, rice, barley, maize, flour is free of customs duties; • customs duties for imported fruits and vegetables of all kinds are set between 10 to 15 percent of total value amount. 	01.10.2017 – to date
President's Decree #5199 “On Measures for Core Improvement of the System of Protection of Rights and Legal Interests of Farmers, Dekhkan Farms and Owners of Household Land, Effective Use of Agricultural Land”,	Cabinet of Ministers, Ministry of Agriculture	<ul style="list-style-type: none"> • The establishment of an effective system for protecting farmers, dekhkan farms and landowners rights and legitimate interests, improving the regulatory framework in this area; • The increase of the personal interest and responsibility of farmers, dekhkan farms and landowners on the effective use of crop areas, while 	2017 – to date

09.10.2017		<p>creating an effective system of parliamentary, representative and public control;</p> <ul style="list-style-type: none"> • The creation of favorable conditions for the development of diversified farms, strengthening of measures for their support by the state; • The wide propaganda among the rural population of the slogan "The personal plot of land - the source of additional income!", as well as its introduction into the daily activities of landowners; • The increase of the knowledge and experience of landowners, developing a system for providing them with the necessary information. 	
Cabinet of Ministers' Resolution #845 "On Measures to Strengthen the Feed Base of Livestock and Fish Farming", 18.10.2017	Ministry of Agriculture, Association "Uzbekbaliksanoat", JSC "Uzdonmakhsulot"	Establishment of the order, according to which the sale of wheat, allocated from state resources for food purposes, will be executed by business entities of livestock and fish breeding at exchange trades held by JSC "Uzbek Republican Commodity and Raw Exchange".	2017 – to date
President's Resolution #3344 "On Additional Measures for Ensuring Food Security in the Republic and Further Improvement of the Activity of the Association "UzbekOziqOvqatZakhira", 20.10.2017	Ministry of Agriculture, Association "Uzbekoziqovqat zakhira"	<p>Establishment of territorial branches and organizations of "UzbekOziqOvqatZakhira" for harvesting and storing fruit and vegetable products aimed at:</p> <ul style="list-style-type: none"> • storage of fruit and vegetable products in volumes as per parameters of the state order, and its planned sale for the purpose of year-round and uninterrupted supply of fresh fruit and vegetables to the population and other consumers at affordable stable prices; • expansion of the retail trade network, including farmers food markets, with the direct supply of fruit and vegetable products to markets directly from producers through the establishment in all regional centers of facilities for purchasing fruit and vegetables from the population; 	2017 – to date

		<ul style="list-style-type: none"> reliable and uninterrupted provision of the population, including located in remote and hard-to-reach settlements, as well as social institutions, with food and fruit and vegetable products. 	
President's Resolution # 3377 "On Additional Measures for Support of Domestic Exporters of Fruit and Vegetable Products, Grapes, Melon Crops, Legumes, and Dried Vegetables and Fruits", 06.11.2017	Cabinet of Ministers, Centrak Bank of Uzbekistan, HC "UzbekOzikOvkat Holding"	<p>To foster the export of fresh and dried fruit and vegetable products:</p> <ul style="list-style-type: none"> economic entities have the right to export fruits and vegetables without the conclusion of an export contract (contract) on the basis of an invoice, subject to the following conditions: <ul style="list-style-type: none"> the amount of delivery does not exceed the equivalent of 20 thousand US dollars on the day of registration of the export customs declaration; 100% prepayment in foreign currency from non-residents of the Republic of Uzbekistan to accounts with authorized commercial banks of the Republic of Uzbekistan. 	2017 – to date
Cabinet of Ministers' Resolution #25 "On Measures to Facilitate Further Efficient Use of Lands and Additional Income of Farms", 14.01.2018	Cabinet of Ministers, Ministry of Agriculture	The main objective is to enforce efficient use of land owned by farms through implementation of the wide set of measures directed at improvement of the land management, water supply, and stimulating farmers to adopt construction of greenhouses on unused plots of land.	2018 – to date
President's Decree #5303 "On Measures for Further Provision of the Food Security of the Country", 16.01.2018	Cabinet of Ministers	The main objective is to ensure the country's food security, saturation of the domestic market with high-quality, safe and affordable food products, and strengthen the purchasing power of the population.	2018 – to date
President's Decree #5388 "On Additional Measures For The Accelerated Development Of Fruit And Vegetable Growing In The Republic Of Uzbekistan", 29.03.2018	Cabinet of Ministers	The main objective is to structure the whole cycle of the production fruits and vegetables in the form of specialized clusters.	2018 – to date
President's Decree #5418 "On Measures of Cardinal	Cabinet of Ministers,	The Ministry of Agriculture is entitled to be the primary state body to coordinate the implementation	2018 – to date

Improvement of the System of Public Administration of Agriculture and Water Management”, 17.04.2018	Ministry of Agriculture	of the food security policy measures.	
Law “On Food Security” Draft			

7.5 Hierarchy and timeframe of the legal act adoption procedure in the field of food security

The procedure for adopting a legal act (Law, Decree, Resolution) in Uzbekistan follows a certain sequence of steps (step 1 to step 5 below), which involves initiative and decision-making institutions.

Step 1:

1	Institutions	The Government, Civil society, Expert community
	Process	The Government (Cabinet of Ministers), the Civil society (through the People's Reception Office of the President), the Experts community act with the initiative/idea/proposal for the adoption of a legal act in the field of food security.
	Outcome	Initiative/idea/proposal on legal act
	Timeframe	The adoption of the initiative/idea/proposal for consideration takes from 1 to 3 months.

Step 2:

2	Institutions	The Government, working group
	Process	The Government forms a working group to study the initiative/idea/proposal.
	Outcome	The working group develops a draft of a legal act.
	Timeframe	Study of the initiative/idea/proposal and design of a draft of a legal act takes from 1 to 3 months.

Step 3:

3	Institutions	Civil society, Expert community
	Process	The designed draft of a legal act is submitted for public discussion to a specialized electronic portal (website) of the Government.
	Outcome	Based on the results of public discussion, amendments and revisions are made to the draft of a legal act.
	Timeframe	Public study and discussion of the draft of a legal act takes from 1 to 3 months.

Step 4:

4	Institutions	The Government, working group for study
	Process	The working group finalizes the draft of a legal act, taking into account the results of the public discussion.
	Outcome	Based on the results of the public discussion, final amendments and revisions are made to the draft of a legal act.
	Timeframe	The development of the final draft of a legal act takes up to 10 days.

Step 5:

5	Institutions	The Parliament, the President, the Government,
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Process	Depending on the type of a legal act, the final draft of a legal act is approved and adopted by the Parliament, or the President, or the Government.
Outcome	The legal act officially adopted.
Timeframe	The process of official adoption of a legal act takes up to 10 days.

7.6 Limitations and barriers in the procedure for the adoption of a legal act

- 1. Short timeframe for consideration and study of the draft of a legal act.** According to experts, the current timeframe for reviewing and studying the draft of a legal act is insufficient for a qualitative and comprehensive analysis and consideration of all of its aspects. For example, according to the Decree of the President # 5303 "On Measures for the Further Provision of the Food Security of the Country" of January 16, 2018, the draft of the Law "On Food Security" should be developed within 3 months, which, in the opinion of experts, is not enough, since it is necessary to conduct deep preliminary research in the field of food security.
- 2. Lack of competent specialists (working group) to study and develop a legal act.** Experts point out that in the working group the main burden on the study and development of the legal act draft falls on a certain narrow group of specialists who are well versed in this field. This implies that the development of the legal act draft can take a long time or leads to a low quality of the developed legal act draft due to the lack of time for a narrow group of specialists to study all aspects of this legal act.
- 3. Lack of data and basic research for the development of a legal act.** The development of the legal act draft should be based on in-depth studies of the field, which will be regulated by the proposed legal act. The lack of a demand for a qualitative study of the regulated field leads to the development and adoption of the legal act, which does not always take into account all aspects of the regulated sphere. For example, to qualitatively develop a draft of the Law "On Food security", it would be beneficial to conduct a national study on the opinion of the population (of all strata) on food security (the quality of consumed food in households, the level of prices, the public's concerns about access to food, etc.), or audit of all state bodies (i.e. Statistics Committee) for available and processed information, the identification of work duplication and the forthcoming development of missing, but necessary indicators on food security, etc.

8. Towards an Improved FSN Policy Framework

8.1 Priorities for food security and nutrition policy

Based on the adopted legislation and discussion with experts, the following current priorities in the field of ensuring food security can be defined:

8.1.1 Ensuring economic and physical accessibility of food for all segments of the population.

Economic and physical access or availability of foodstuff can be reached through several measures, including:

a) The expansion of the production of foodstuffs

From the first days of independence, achieving food security was the main goal of state policy. For example, grain independence was achieved already in the late 90's of the 20th century due to a reduction in acreage under cotton and an increase in the yield of wheat. Given the continuing demographic growth of the population in Uzbekistan, in recent years the government has boosted its actions to increase the production of food products. Cotton has almost lost its status of the main strategic crop and the process of its replacement with food crops (fruits, vegetables, melons, etc.) continues. For instance, in 2017 it was decided to replace cotton on lands with low yields with pepper in the Republic of Karakalpakstan.

To further streamline the process of food policy, the system of the state order for the purchase of fresh fruit and vegetable products was introduced in 2016, which provides basis for the storage of fresh fruits and vegetables, the steady saturation of the domestic consumer market in the winter-spring period. It is a significant change, since before only cotton and wheat crops were under state order regulation.

The Government also plans to frame the production of all fruits and vegetables in specialized clusters, in order to ensure the accelerated and effective development of fruit and vegetable growing, expand production of high-quality and competitive finished products, its further promotion to large foreign markets¹³.

The goal is to implement cluster form of organization of fruit and vegetable production, which provides for the formation of a chain, based on the principle of "seeds - seedlings (saplings) - growing products - harvesting - storage - processing - transportation - delivery to the market". Clusters are going to be organized:

- In the framework of a single or a group of interconnected enterprises that independently carry out the entire cycle from production to the sale of fruit and vegetable products; and
- On the basis of guaranteed contracts between producers of agricultural products and enterprises, procurers, processors, exporters, supplying agricultural producers with planting stock, advance resources for the organization of agricultural work and purchasing their manufactured products at negotiated prices.

First fruit and vegetable clusters will be established already in 2018: 1-2 units in each region of Uzbekistan. 2019 will be the year when all production of fruits and vegetables will be solely organized in the form of clusters.

Clusters are granted the right to independently make decisions on the placement of agricultural crops, determine the volume of cultivation of products, their types and varieties, the use of agrotechnological methods, taking into account soil and climate conditions and the

¹³ President's decree #5388 "On Additional Measures for the Accelerated Development of Fruit and Vegetable Growing", March 29th, 2018

orientation on demand in the domestic and foreign markets, and contracting contracts with farmers and *dehqon* farms to harvest their agricultural products.

Certain preferences are granted to business entities, involved in fruit and vegetable clusters, such as exemption from:

- All types of taxes and fees (with the exception of a single social payment), in the part of producing seeds, seedlings, seedlings and rootstocks in nurseries and greenhouses and supplying them to agricultural producers;
- Customs payments (except for customs clearance fee) imported seeds, seedlings and rootstocks, mineral fertilizers, chemical plant protection products, modern energy-saving greenhouses and related accessories in accordance with the approved list;
- Payment of customs duties and fees to the Republican Road Fund for imported vehicles for transporting fruit and vegetable products.

The Government has also decided to focus on the enhancement of the feed base for livestock and fish farming. Currently, more than 6 thousand livestock and 3 thousand fish farms are operating in the country, and, according to estimates, it was expected to produce 2319 thousand tons of meat, 60 thousand tons of fish in artificial reservoirs last year (2017).

However, insufficient attention has been paid to the development of the fodder base for livestock and fish farming. Due to disruptions in providing livestock, fish farms and organizations with high-quality fodder, the growth rates of livestock and fish production remain low.

In order to strengthen the fodder base of industries on a systematic basis, to ensure stable supply of livestock, fish farms and organizations with high-quality fodder, the Government established the procedure according to which, starting from the harvest of 2017, the sale of wheat, allocated from state resources for feed purposes, will be carried out by the livestock and fish breeding business entities at the exchange auctions, conducted by JSC "Uzbek Republican Commodity and Raw Materials Exchange"¹⁴.

We can see that the state policy tends to control and coordinate the whole cycle of food production, evidenced also by the National Program "On further development of raw materials base, advanced processing of fruit and vegetable, and meat and dairy products, and increase in production and export of food products for 2016-2020" adopted in the beginning of 2016..

b) Price-setting policy

Prices are one of the key criteria defining the economic accessibility of food products. Thus, in order to fully meet the growing demand of the population for the main types of socially important food products, to prevent the emergence of factors that lead to higher prices, inflationary expectations and decrease of real incomes of the population, the Government adopted a Resolution¹⁵ in 2017, which:

¹⁴Cabinet of Ministers' Resolution # 845, "On Measures To Strengthen The Feed Base Of Livestock And Fish Farming", October 18th, 2017.

¹⁵Cabinet of Ministers' Resolution # 3082 "On Urgent Measures For The Reliable Provision Of The Population Of The Republic With The Main Types Of Socially Important Food Products", June 23rd, 2017.

- Establishes the Republican Commission for monitoring and control of the prices for the main types of socially significant foodstuffs. This Commission is headed by the Prime Minister and has regional branches throughout the country;
- Establishes the Fund for the promotion of price stabilization in the domestic consumer market. This Fund is accountable strictly to the Government and has charter capital equivalent to 100 million US dollars. The Fund's resources are used to smooth out seasonal and other sharp fluctuations in supply and demand for food products in the domestic market, primarily for meat, vegetable and animal oils, cereals, flour, potatoes, carrots, onions, and other important types of socially important food products;
- Authorizes the Commission to implement, together with law enforcement bodies, systematic control over the prevention of artificial price increase and misuse of the Fund's allocated resources with the adoption of strict measures against the perpetrators.

Thus, newly established Fund is designed to serve as a safety net for stabilization of the food prices. However, the efficiency of this Fund's activity yet to be seen and proved, since the regulation of the prices usually leads to opposite results as was the case before in Uzbekistan.

Also, this Resolution stipulates that state authorities should study the mechanism of the formation of the prices for main food products, and create conditions for the establishment of sound competitive environment in the food markets.

c) Increase of income of the population

Another major aspect that defines the economic accessibility of foodstuffs is the level of income of population. In the first years of independence, there was a massive transfer of land and livestock to households (free of charge or at nominal prices). Other food security policy instruments complemented this type of in-kind support, providing the population with additional products and incomes.

Nowadays, the Government undertakes various measures to increase income levels of the population. These measures range from adopting national programs on employment, supporting small and medium businesses, to promoting the efficient use of agricultural land by households. As for the latter, the state follows the wide known policy of "carrots and sticks". The government ensures support to agricultural land users (households) helping to create necessary infrastructure and conditions in rural areas. In return, the government expects the efficient use of household small land plots (*tamorqa*, average size – 0.12 ha), otherwise households that don't use the land at all will be deprived of it, or those that use it inefficiently will pay land taxes at a rate three times as much as current one.¹⁶

Thus, the policy is directed towards full utilization of not only farmlands, but also of small land plots, urging rural households to become like entrepreneurs and use land as a source of income.

¹⁶ President's Decree #5199 «On Measures for Core Improvement of the System of Protection of Rights and Legal Interests of Farmers, Dekhkan Farms and Owners of Household Land, Effective Use of Agricultural Land», October 9th, 2017

d) Establishment of new institutions

The whole system of state governance in Uzbekistan has been undergoing significant changes, both structural and functional, since the election of the new President in the end of 2016. And this process is still under progress as of the time of writing this report. These changes, naturally, impact the policy in the sphere of food security.

Earlier, the Ministry of Agriculture and Water Resources was responsible for administration of policies in agriculture and water resources management. In early 2018 the Ministry was split into two legally separate organizations: one being responsible for agriculture management, and the other – for water resources management.

Changes have also touched upon the food industry itself. In 2016, the holding company "UzbekOzikOvkatHolding" was established, which includes almost all of the important enterprises of the country for processing and producing food products (fruit and vegetable, meat and milk products, etc.). There was also established, within the structure of HC "UzbekOzikOvkatHolding", the specialized foreign trade company JSC "Uzagroexport" in April of 2016. JSC "Uzagroexport" is responsible for export of fresh and processed food products, produced by companies of HC "UzbekOzikOvkatHolding".

In October of 2017 there was established another organization within HC "UzbekOzikOvkatZahira" – Association "UzbekOzikOvkatZahira"¹⁷. This Association incorporates all national facilities for storage of fruit and vegetables, meat and milk, potato and other food items. "UzbekOzikOvkatZahira" plays an important role since it is responsible, among others, for:

- Formation and planned sale of fruit and vegetable products in volumes as per state order for the purpose of year-round and uninterrupted supply of fresh fruit and vegetables to the population and other consumers at affordable stable prices;
- Expansion of the retail trade network, including *dehqon* food markets (farmer markets), with the establishment of direct supplies of fruit and vegetable products to them, avoiding middlemen, via all regional centers points for purchasing fruit and vegetables from the population (producers);
- Reliable and uninterrupted provision of the population, including in remote and hard-to-reach settlements, as well as social institutions, with food, and fruit and vegetable products.

It must be pointed out that HC "UzbekOzikOvkatHolding" is fully accountable to the Government, which can now directly impact the entire cycle of food production to pursue its national food security policy goals.

e) Liberalization of currency exchange, import and export policy.

It is no secret that the Government strictly controlled currency exchange market until 2017. Absence of de-facto free currency exchange negatively affected the whole economy. The new

¹⁷ President's Resolution # 3344 "On Additional Measures To Ensure Food Security In The Country And Further Improvement Of The Activities Of The Association "UzbekOzikOvkatZahira", October 20th, 2017.

Government liberated the currency exchange market in 2017, and entrepreneurs can freely exchange local currency for foreign ones. Consequently, currency exchange market liberalization leads to expansion and development of import and export operations in the country.

The previous import-export policy was more restrictive in that it had imposed high customs duties for imported products and banned some products from being exported. However, things started to change in this matter also in 2017.

In order to saturate domestic market with quality and affordable food products, the Government has decreased or even abolished customs duties and fees for certain number of food items¹⁸ since October 1st, 2017. For example, the import of fish and sea products (fresh, frozen, dried, etc., except for live fish), livestock, cattle meat, sheep and goat meat, milk, potato, wheat, rice, barley, maize, flour is absolutely free of customs duties. Customs duties for imported fruits and vegetables of all kinds vary between 10 to 15% of total value amount.

The ban on export of fresh fruits and vegetables was lifted and starting from July 1st, 2017, business entities are allowed to export fresh fruits and vegetables, grapes, and melons on the condition of direct contracts with a 100% advance payment¹⁹. To even further encourage the export of fresh and dried fruit and vegetable products, the Government entitled business entities (entrepreneurs of all kinds) with the right to export fruits and vegetables without the conclusion of an export contract on the basis of an invoice (100% advance payment), under the condition that the amount of delivery does not exceed the equivalent of 20 thousand US dollars on the day of registration of the export customs declaration.

All of the above represents the essence of the new policy in food and nutrition security, concerning the accessibility, both physical and economic, of food products in Uzbekistan. This policy is characterized by liberalization of certain aspects of economic activity in food sector, and, at the same time, the increase of state involvement in the regulation and management of food sector: starting from the process of planning the annual amounts of total food products (crops, local production), and ending with the export of fresh and processed food products.

8.1.2 Promotion of healthy nutrition to achieve a balanced diet among the population

The other priority of the state policy on the food and nutrition security is related to ensuring healthy nutrition. Nutrition is one of the most important factors determining the health of the population. Healthy nutrition is a food that provides growth, normal development and life activity of a person, contributing to strengthening of his health and reduction of diseases. Any violation of the balance in the structure of nutrition has a negative impact on human health, and is also one of the main factors in reducing the quality of life. Maintaining a balanced and nutritious diet - is especially important for Uzbekistan, given the role of bread in the structure of the households consumption.

¹⁸ President's Resolution # 3303 "On Measures On The Further Regulation Of The Foreign Economic Activity Of The Republic Of Uzbekistan", September 29th, 2017.

¹⁹ President's Resolution # 3077 «On Measures for the Further Support of Domestic Organizations-Exporters and the Improvement of Foreign Economic Activity», June 21st, 2017.

In this regard, in 1997 the government adopted a national nutrition policy, and in 2009 – the National Strategy for Improving Nutrition, with emphasis on the prevention of micronutrient deficiencies through food fortification and adaptation. Within the framework of the program, the 1st grade flour at all state flourmills is subject to fortification²⁰.

In the section, dedicated to legal framework, we mentioned legal acts that regulate the production of safe and quality food, and define measures against iodine and micronutrient deficiencies among population.

Improving the structure of nutrition and diet, along with other factors, positively affected the health indicators of the population. Over the past 10 years, the proportion of children with reduced body weight decreased more than twofold (from 4% to 1.8%), and the incidence of women with anaemia decreased 2.5 times. The average life expectancy of the population of Uzbekistan increased by 6.5 years (from 67 to 73.5 years), and the average life expectancy of women – up to 75.8 years.

In order to streamline the process of supporting and promoting healthy nutrition, the Government approved the “Concept for the Provision of Healthy Nutrition for the Population of the Republic of Uzbekistan for the Period of 2015 - 2020 Years”, in August of 2015. The main goal of the Concept is the implementation of the range of measures, aimed at maintaining and strengthening the health of the population, preventing diseases, and creating, in accordance with the requirements of medical science, conditions that meet the needs of various groups of the population in healthy nutrition.

The Concept provides for various measures starting with the improvement of legal framework, production of healthy food, promotion of and creating conditions for healthy nutrition and lifestyle, and ending with education and training of medical personnel.

Within the framework of the implementation of this Concept, among others, the following tasks are defined:

- Establishment of effective control over the quality and safety of food products consumed in educational institutions;
- Development of recommended average daily nutrition for different sex and age groups and occupational groups, taking into account the therapeutic and prophylactic properties of food;
- Expansion of the range of dietary sour-milk products produced by domestic food industry enterprises;
- The implementation of a pilot project, aimed at creating a culture of healthy nutrition and lifestyle among the population of Kashkadarya and Fergana regions, with the subsequent dissemination of the positive experience to all regions of the country;
- Harmonization of national standards on food quality and safety with those, recommended by FAO/WHO.

²⁰ CER Report “The main directions of food security policy in Uzbekistan”, 2013.

- The study of the diet among various groups of the population and of the causes of the development of common diseases associated with inappropriate nutrition;
- The development of scientifically based recipes for dietary foods and beverages based on local food for children and adults.

Successful implementation of the Concept will help to achieve the following expected results by 2020:

- The consumption of vegetables and fruits will increase by 15%;
- The consumption of foods with high salt content will reduce by 15%;
- The proportion of pregnant, infants and children under five years of age, whose diet will meet the standards of healthy nutrition, will increase by 10%;
- Tobacco consumption and harmful alcohol consumption will reduce by 10%;
- Domestic production of healthy, safe and high-quality agricultural fruit and vegetable, and meat and dairy products will expand;
- The volume of production, processing and sale of products with a low content of free sugars, salt, saturated and trans fatty acids will increase;
- The share of production of products enriched with vitamins and necessary minerals will increase.

Thus, we can see that the Government of Uzbekistan assumes a very thorough approach in tackling nutrition policy, at least formally. Propaganda of healthy lifestyle is crucial, since it is very hard to change long-established stereotypes of behaviour of the people.

8.2 Food security policy Vs. agricultural development policy

Policy in the field of ensuring food security is intrinsically intertwined with the strategy of agricultural development. The agricultural development strategy is primarily aimed at increasing the volume of food production in order to meet the needs of the growing population. Food security also implies, among other things, meeting the population's needs in food.

Nevertheless, there are some contradictions between these policies.

- The mandatory process of transformation of farms into multi-specialized agricultural producers sometimes doesn't take into account the specifics of each farm, as was the case in implementing previous reforms, such as optimization of farms sizes. Some farms are ready for the transformation, while others are not.
- Intensive development of agriculture involves the use of chemicals to increase crop yields, which negatively affects the quality of crops. For example, intensive gardens use chemical fertilizers to produce high yields from dwarf varieties of fruit trees, which affect the quality (safety and taste) of fruit;

- Increasing the export potential of agriculture to some extent affects the growth of domestic food prices. Agricultural producers (farmers) will receive more profit from exporting of their products, which, according to the basic economics, may lead to a decrease in domestic supply (reduced physical accessibility) and an increase in domestic prices (reduced economic accessibility).
- Lack of data and monitoring of the differences between the necessary and actual consumption of food products by the population, and insufficient account of the demand and needs in food products.

9. Suggestions and recommendations for improving FSN in Uzbekistan

Simultaneous with the surge in food output, annual population growth rates were between 1.2–1.5 %. This suggests that food availability in Uzbekistan has gradually improved in recent years. Imports of food declined considerably. Although this reduced import dependency, it also to some extent lessened food availability. Overall, food availability in Uzbekistan is adequate in terms of calories. Generally speaking, Uzbekistan has a secure supply of food at the national level.

However, as was stated by interviewed experts, further ensuring of food security in Uzbekistan is impossible without proper management of natural resources, and of the most important resource, or rather, national capital – the soil. Without a fertile soil, it is impossible to ensure food security today and guarantee it for future generations. It is necessary to promote technologies and practices that ensure food security, which does not depend on imports. It is necessary to develop and promote a balanced and varied diet among the population in each region. The population should be provided equally with all the necessary food at the desired (and most importantly recommended by nutritionists) levels of meat, fish, poultry, vegetables, fruits and the entire line of cereals and legumes.

In more details, at consumers' side:

- We need more articles and discussions in the mass-media, TV about healthy nutrition. It is necessary to inform the population about the importance of healthy nutrition. State bodies should pay more attention to the production of products that meet medical standards.
- Dissemination of information on healthy nutrition, working with the local population: in urban and rural areas;
- Develop a mobile application for smartphones on food security: with information on what food security is, what measures should be taken for each person (the population), how to ensure food security for us and our children and grandchildren - information should be available in Russian and Uzbek languages.
- Change the diet of nutrition, etc.

At producers' side:

- Scientific-applied and industrial research and trainings on the introduction of advanced agricultural technologies are needed;
- Establishment of extension services for farmers;
- Enhancement of the economic sustainability of farm and dehqon (private) entities.
- Data collection and analysis at the farmers' level;
- Introduction of new technologies.

At processors' side:

- The World Bank should provide effective assistance in financing the purchase of the modern laboratory equipment for the food laboratory of HC "UzbekOzikOvkatHolding", and training specialists in accordance with the requirements of ILAC.
- Strict control over food producers is required. It is necessary to establish integrated control over the quality of food products, to harmonize domestic standards with international ones.
- Development of the Technical Regulations for membership in the WTO, the Customs Union.
Development and improvement of training programs. Strong human resources policy!
Development of non-traditional/innovative technologies and practices. Their introduction and implementation, taking into account global environmental problems.

At state level:

- Ensure food safety. Quantity is important, but quality too!
- Increasing the number of scientific and applied research in the field of food security, including marketing research;
- Increasing domestic capacity at the national level in the field of food security;
- Adoption of the Strategy for Food Security
- Regulation of existing legal acts in the field of ensuring food security;
- Develop an integrated strategy for food security;
- Carry out an analysis of food security issues;
- Seeking for foreign grants/connections.
- Creation of legislative, economic and institutional basis for increasing productivity/efficiency of water resource use and ensuring food security.
- Working towards regional division of production and processing of food products in the country. With this regard, long-term economic regional integration is required in the country on the basis of scientific research of suitability of soil-climatic conditions of each region of Uzbekistan to production of certain agricultural products. For example, establishment of separate regions for producing wheat/grains, fruits and vegetables, meat and dairy products.

With regards to food safety, the following recommendation can be drawn:

1. Introducing the healthy nutrition objectives and indicators into socio-economic, education, research and health programs at systemic level, with special focus on targeting the

vulnerable groups of population and improve equity through participation, access to information and knowledge.

2. Improve the traceability mechanisms for producing, processing, storage and preservation to retain nutritional food, to ensure food safety, to reduce seasonal and post-harvest losses and integrate these mechanisms into e-agriculture, e-marketing, e-trade and e-health systems.
3. Monitoring of dietary consumption and access to safe, balanced and nutritious food. Update and maintain the accessible database on food prices, food products, food substances, mineral substances, vitamins, water for age and sex disaggregated population groups, especially for vulnerable groups.
4. Enhancing the capacity of institutions and individuals to improve nutritious food consumption, through broader raising awareness, advocacy and targeted learning programs, and involving in this process NGOs, CSOs, private sector, research, education, and health system institutions, producers and consumers associations.

A number of current and expected trends in the global and national economy are posing new challenges for sustaining nation's food security in the long term. For the one thing, expected changes in the demographic pattern, growth of personal income and related transformations of the lifestyle and behavioural stereotypes will eventually lead to the substantial increase in demand for food products and transform people's food consumption pattern. For another, there will be challenges associated with the expected rise of world food prices due to the growing demand for food in the third world countries and the deteriorating food supply because of the expanding biofuel production (CER, 2013). Ensuring food security, therefore, will require more complex approaches, policies and tools.

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ANNEX 1: The list of selected legal acts adopted in the field of food security and nutrition in Uzbekistan

#	Name	Date
<i>Regulation of the food products quality and nutrition</i>		
1	Law "On Quality and Safety of Food Products"	30.08.1997
2	Law "On Prevention of Iodine Deficiency Diseases"	03.05.2007
3	Law "On Prevention of Micronutrient Deficiency Among the Population"	07.06.2010
4	Sanitary Rules and Norms #0344-17 Production of Fruit and Vegetable Canned Food, Dried Fruit, Vegetables and Potatoes, Sauerkraut and Salted Vegetables	03.02.2017
5	Cabinet of Ministers' Resolution #490 "On Approval of the General Technical Regulations on the Safety of Food Products in the Terms of its Labeling"	12.07.2017
<i>Regulation of food industry and its infrastructure</i>		
6	President's Resolution #2492 "On Measures for the Further Improvement of the Organization of the Food Industry of the Republic"	18.02.2016
7	President's Resolution #2505 "On Measures for the Further Development of the Raw Base, Deepening the Processing of Fruit and Vegetable, and Meat and Dairy Products, Increasing the Production and Export of Food Products in 2016-2020"	05.03.2016
8	President's Resolution #3344 "On Additional Measures for Ensuring Food Security in the Republic and Further Improvement of the Activity of the Association "Uzbekoziqovqatzakhira"	20.10.2017
<i>Regulation of food security measures</i>		
9	Cabinet of Ministers' Resolution #102 "On Further Improvement of Implemented Measures in the Field of Healthy Nutrition of the Population of the Republic of Uzbekistan"	25.04.2015
10	Cabinet of Ministers' Resolution #251 "On the Approval of the Concept and Set of Measures for the Provision of Healthy Nutrition for the Population of the Republic of Uzbekistan for the Period of 2015 - 2020 Years"	29.08.2015
11	President's Resolution #3082 "On Immediate Measures for the Reliable Provision of the Population of the Republic with the Main Types of Socially Significant Food Products"	23.06.2017
12	President's Decree #5303 "On Measures for Further Provision of the Food Security of the Country"	16.01.2018
13	Sanitary Rules and Norms #0347-17 "Physiological norms of micronutrient and energy requirements for various population groups of Uzbekistan based on gender, age and profession for sustaining healthy nutrition". Introduced by the Decree #4 of the main state doctor of Uzbekistan	22.03.2017

14	Law “On Food Security”	Draft
Regulation of agriculture		
15	President’s Resolution #2505 “On Measures for the Further Development of the Raw Base, Deepening the Processing of Fruit and Vegetable, and Meat and Dairy Products, Increasing the Production and Export of Food Products in 2016-2020”	05.03.2016
16	President’s Decree #5199 “On Measures for Core Improvement of the System of Protection of Rights and Legal Interests of Farmers, Dekhkan Farms and Owners of Household Land, Effective Use of Agricultural Land”	09.10.2017
17	Cabinet of Ministers’ Resolution #845 “On Measures to Strengthen the Feed Base of Livestock and Fish Farming”	18.10.2017
18	Cabinet of Ministers’ Resolution #25 “On Measures to Facilitate Further Efficient Use of Lands and Additional Income of Farms”	14.01.2018
19	President’s Decree #5418 “On Measures of Cardinal Improvement of the System of Public Administration of Agriculture and Water Management”.	17.04.2018
20	President’s Decree #5388 “On Additional Measures For The Accelerated Development Of Fruit And Vegetable Growing In The Republic Of Uzbekistan”	29.03.2018
Regulation of trade and export of food products		
21	President’s Resolution #2515 “On the establishment of the specialized foreign trade company for the export of fresh and processed fruit and vegetable products “Uzagroexport”	25.04.2016
22	President’s Resolution #3077 “On Measures for Further Support of Domestic Exporting Organizations and Improvement of Foreign Economic Activity”	21.06.2017
23	President’s Resolution #3303 “On Measures on Further Regulation of the Foreign Economic Activity of the Republic of Uzbekistan”	29.09.2017
24	President’s Resolution # 3377 “On Additional Measures for Support of Domestic Exporters of Fruit and Vegetable Products, Grapes, Melon Crops, Legumes, and Dried Vegetables and Fruits”	06.11.2017

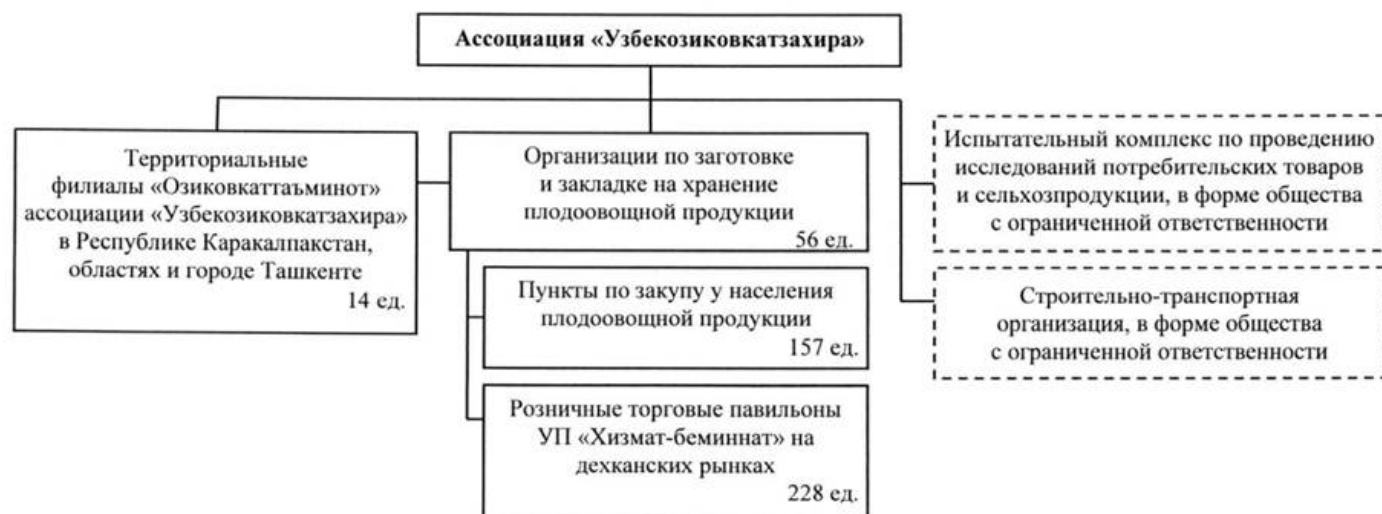
ANNEX 2: The list of selected FSN legal acts of the Republic of Uzbekistan (in Russian)

№	Наименование	Дата
<i>Регулирование качества продовольственных продуктов</i>		
1	Закон «О Качестве и Безопасности Пищевой Продукции»	30.08.1997
2	Закон «О Профилактике йододефицитных заболеваний»	03.05.2007
3	Закон «О Профилактике Микронутриентной Недостаточности Среди Населения»	07.06.2010
4	СанПиН №0344-17 Производства Плодоовощных Консервов, Сушёных Фруктов, Овощей и Картофеля, Квашеной Капусты и Солёных Овощей	03.02.2017
5	ПКМ-490 – «Об Утверждении Общего Технического Регламента о Безопасности Пищевой Продукции в Части её Маркировки»	12.07.2017
<i>Регулирование пищевой промышленности и её инфраструктуры</i>		
6	ПП-2492 «О Мерах по Дальнейшему Совершенствованию Организации Управления Пищевой Промышленности Республики»	18.02.2016
7	ПП-2505 «О Мерах по Дальнейшему Развитию Сырьевой Базы, Углублению Переработки Плодоовощной и Мясомолочной Продукции, Увеличению Производства и Экспорта Продовольственных Товаров в 2016 — 2020 Годах»	05.03.2016
8	ПП-3344 «О Дополнительных Мерах по Обеспечению Продовольственной Безопасности в Республике и Дальнейшему Совершенствованию Деятельности Ассоциации «Узбекозиковкатзахира»	20.10.2017
<i>Регулирование мероприятий по обеспечению продовольственной безопасности и безопасности питания</i>		
9	ПКМ-102 «О Дальнейшем Совершенствовании Реализуемых Мер в Области Здорового Питания Населения Республики Узбекистан»	25.04.2015
10	ПКМ-251 «Об Утверждении Концепции и Комплекса Мер по Обеспечению Здорового Питания Населения Республики Узбекистан на Период 2015 — 2020 Годы»	29.08.2015
11	ПП-3082 «О Неотложных Мерах по Надёжному Обеспечению Населения Республики Основными Видами Социально-Значимых Продовольственных Товаров»	23.06.2017
12	УП-5303 «О Мерах по Дальнейшему Обеспечению Продовольственной Безопасности Страны»	16.01.2018
1	СанПиН № 0347-17. «Физиологические нормы потребностей в пищевых	22.03.201

3	веществах и энергии по половозрастным и профессиональным группам населения Республики Узбекистан для поддержания здорового питания». Введён Постановлением главного государственного врача №4	7
1 4	Закон «О Продовольственной Безопасности»	Проект
Регулирование отраслей сельского хозяйства		
1 5	ПП-2505 «О Мерах по Дальнейшему Развитию Сырьевой Базы, Углублению Переработки Плодоовощной и Мясомолочной Продукции, Увеличению Производства и Экспорта Продовольственных Товаров в 2016 — 2020 Годах»	05.03.201 6
1 6	УП-5199 «О Мерах по Коренному Совершенствованию Системы Защиты Прав и Законных Интересов Фермерских, Дехканских Хозяйств и Владельцев Приусадебных Земель, Эффективного Использования Посевных Площадей Сельского Хозяйства»	09.10.201 7
1 7	ПКМ-845 «О Мерах по Укреплению Кормовой Базы Отраслей Животноводства и Рыбоводства»	18.10.201 7
1 8	ПКМ-25 «Об Организации Мер по Эффективному Использованию Земельных Участков Фермерских Хозяйств и Получению Дополнительного Дохода»	14.01.201 8
1 9	УП-5418 «О Мерах по Коренному Совершенствованию Системы Государственного Управления Сельским И Водным Хозяйством»	17.04.201 8
2 0	УП-5388 «О Дополнительных Мерах по Ускоренному Развитию Плодоовощеводства в Республике Узбекистан»	29.03.201 8
Регулирование торговли и экспорта продовольственных продуктов		
2 1	ПП-2515 «Об образовании специализированной внешнеторговой компании по экспорту свежей и переработанной плодоовощной продукции «Узагроэкспорт»	25.04.201 6
2 2	ПП-3077 «О Мерах по Дальнейшей Поддержке Отечественных Организаций-Экспортёров и Совершенствованию Внешнеэкономической Деятельности»	21.06.201 7
2 3	ПП-3303 «О Мерах по Дальнейшему Упорядочению Внешнеэкономической Деятельности Республики Узбекистан»	29.09.201 7
2 4	ПП-3377 «О Дополнительных Мерах по Поддержке Отечественных Экспортёров Плодоовощной Продукции, Винограда, Бахчевых Культур, Бобовых, а Также Сушёных Овощей и Фруктов»	06.11.201 7

ANNEX 3: Organizational structure of “UzbekOzikOvkatZahira” Company

ОРГАНИЗАЦИОННАЯ СТРУКТУРА Ассоциации «Узбекизовкатзахира»



ANNEX 4: Organizational structure of “UzbekOzikOvkatHolding” Company



АО ХК «Узбекизовкатхолдинг» — вертикально интегрированная трёхуровневая холдинговая компания.

Действующая система управления Холдинга, одобрена в соответствии с Постановлением Президента Республики Узбекистан от 18 февраля 2016г. № ПП-2492 «О мерах по дальнейшему совершенствованию организации управления пищевой промышленности республики» и Постановлением Президента Республики Узбекистан от 7 апреля 2016 года № ПП-2515 «Об образовании специализированной внешнеторговой компании по экспорту свежей и переработанной плодовоовощной продукции «Узагроэкспорт», а также утверждена решением единственного акционера от 10 июня 2016 года Протоколом № 3.

ANNEX 5. The professional groups disaggregated by labor intensity and the list of their professions, according to the Physiological norms of requirements for food substances and energy:

Groups	List of professions
I group. Professionals of predominantly intellectual work:	heads of enterprises and organizations; engineering and technical workers, whose work does not require significant physical activity; medical workers, except for doctors-surgeons, nurses, nurses; teachers; educators, other than sports; workers of science, workers of literature and press; cultural and educational workers; employees of planning and accounting; secretaries; clerks; workers of different categories, whose work is associated with significant nervous tension (workers of control panels, dispatchers, etc.);
II group. Professionals engaged in light physical labor:	engineering and technical workers, whose work is associated with some physical effort; employees employed in automated processes; workers of the electronic industry; sewing machines, agronomists, zootechnicians; veterinary workers; nurses and nurse; sellers of department stores; employees in the service sector; workers in the watch industry; workers of communication and telegraph; teachers; instructors of physical culture and sports, trainers;
III group. Professionals engaged in average physical labor:	machine operators engaged in metalworking and woodworking; mechanics; setters; customizers; doctors-surgeons; chemists; textile workers; shoe makers; drivers of different types of transport; food industry workers; workers of public services and public catering; sellers of food products; brigade leaders of tractor and field teams; railwaymen, water experts; employees of auto- and electric transport; machinists of hoisting and transport mechanisms; polygraphists;
IV group. Professionals of heavy physical labor:	construction workers, the majority of agricultural workers and machine operators, miners in surface works, workers in the oil and gas industry, metallurgists and foundry workers, except persons classified as group V; workers in the pulp and paper and woodworking industries; riggers, woodworkers, carpenters, workers in the building materials industry, except for persons classified as group V;
V group. Workers engaged in particularly heavy physical labor:	miners engaged directly in underground work; steelworkers; wood fellers and workers on cutting wood; masons; concrete workers; excavators; loaders, whose work is not mechanized; workers employed in the production of building materials whose labor is not mechanized.

ANNEX 6. Main definitions and terms used in nutrition and health assurance activities in the Republic of Uzbekistan

Food safety	compliance of food products with sanitary, veterinary, veterinary-sanitary, phytosanitary rules and norms;
biologically active food additives	concentrates of natural or biologically active substances identical to natural substances obtained during the processing of food raw materials or by artificial means and intended for direct intake from food or introduction into foodstuffs;
Sanitary-epidemiological conclusion	a document certifying the conformity of food products and equipment intended for its production and use, sanitary rules, norms and hygienic standards;
identification of food products and food raw materials	the establishment of conformity of food products and food raw materials with distinctive characteristics determined by normative and (or) technical documentation for products of a specific type and name;
quality of food products	a set of characteristics that determine the consumer properties of food products and ensure its safety for life and health of people;
circulation of food products	activities related to the production, procurement, purchase, processing, supply, storage, transportation and sale of food products;
food products	food raw materials (including ethyl alcohol), food products (including alcoholic beverages) and their ingredients, substances, materials, including auxiliary and packaging, and products from them that come into contact with food raw materials and food;
food additives	natural or synthesized substances, compounds deliberately introduced into food products in order to give them specified properties and (or) their preservation;
food products	products made from food raw materials and used for food in natural or processed form;
products of baby food	specialized food products that meet the physiological characteristics of the child's organism (up to three years);
food raw materials	objects of plant, animal, microbiological, as well as mineral origin, water used for food production;
sale of food products	sale, delivery and other forms of food products transfer under certain conditions;
shelf life (term of use) of food products	the period during which food products are suitable for use in compliance with the requirements of safety standards and rules for its storage, transportation, sale and after which it may pose a danger to human life and health;
toxicological and hygienic examination	a complex of laboratory studies of food products intended for comparison with existing norms and rules;
packaging, auxiliary materials and their products	means used to protect food products from external influences during handling;
falsification of food products	deliberate modification of the properties and characteristics of food raw materials and food products or their substitution.
micronutrients	essential nutrients (vitamins and minerals), necessary for normal growth and development of the human body;
micronutrient deficiency	the state of the human body, due to insufficient intake of micronutrients with food, leading to the development of diseases;
enriched food products -	food products enriched (fortified) by micronutrients in the process of its production;
supplementation	the use of micronutrients in preventive doses in the form of medicines among

by micronutrients	target populations;
sanitary and epidemiological welfare of the population	the state of health of the population, in which there is no harmful effect of environmental factors on human beings and favorable conditions for their life are ensured;
state sanitary supervision	activities to prevent, detect and eliminate violations of legislation on the sanitary and epidemiological welfare of the population;
human environment	a set of objects, phenomena and environmental factors that determine the conditions of human life;
sanitary and hygienic and anti-epidemic measures	organizational, administrative, engineering, medical and other measures aimed at preventing the occurrence and spread of infectious and parasitic diseases and their elimination;
sanitary and epidemiological situation	the state of the habitat and health of the population in a particular territory at a specified time;
sanitary and epidemiological Service	a unified system that includes centers of state sanitary and epidemiological surveillance, centers for the fight against acquired immunodeficiency syndrome (AIDS), disinfection stations, centers for the prevention of plague, quarantine and especially dangerous infections, research institutions operating in the area of sanitary and epidemiological welfare of the population;
restrictive measures (quarantine)	administrative, health and other measures aimed at preventing the spread of infectious and parasitic diseases, providing for a special regime of economic and other activities, restricting the movement of the population, vehicles, cargo and (or) goods;
infectious and parasitic diseases	human diseases, the emergence and spread of which is due to human exposure to biological factors of its habitat and the possibility of transferring the disease from a sick person or animal to a healthy person.
technical regulation (legal framework)	the establishment, application and implementation of mandatory requirements for the safety of products, works and services;
safety of products, works and services	the state of the products, the processes of its design, production, operation (use), installation, commissioning, storage, transportation, sale and disposal, work performed, services provided, which does not contain an unacceptable risk associated with the likelihood of harm life, health, environment, property of legal entities, individuals and the state;
normative documents in the field of technical regulation	technical regulations, normative documents on standardization, sanitary, veterinary, veterinary-sanitary, phytosanitary rules and norms, town-planning, ecological norms and rules and other documents in the field of technical regulation;
technical regulation (regulative document)	a normative document in the field of technical regulation that establishes mandatory requirements for the safety of products and services;
general technical regulation	normative document in the field of technical regulation, establishing mandatory requirements for the safety of a group of homogeneous products and services;
a special technical regulation	a normative document in the field of technical regulation that establishes mandatory requirements for the safety of a particular type of products and services that are not provided for in the general technical regulations;
technical barriers to trade	trade barriers arising from differences or changes in mandatory requirements for the safety of products and services contained in regulatory documents in the field of technical regulation.

