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Food Security in 2030: Availability, Access and Nutrition

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Expected changes in the demographic pattern, growth of personal income and related transformations of the lifestyle and behavioral stereotypes will eventually lead to the substantial increase in demand for food products, transform people's food consumption pattern. On the supply side, climate change as well as the accelerated transformations and rapid industrialization could augment negative anthropogenic impact on the environment, affect water supply, quality of land, thus, influencing the crop yield and productivity in agriculture. Therefore, ensuring food security towards 2030 will require more complex approaches, policies and tools. The paper suggests strategies for food policy in Uzbekistan towards 2030 incorporating three key dimensions: 1) food availability; 2) access to food; and 3) balanced and high quality nutrition.



1 Introduction

Food security has been a high priority in the socio-economic policy of Uzbekistan since the early years of independence. As a result of policies pursued, Uzbekistan has managed to achieve (and maintain thereafter) grain independence, and increase its per capita production of meat, milk, eggs, fruit and vegetables substantially enough to achieve self-sufficiency in basic foods. These accomplishments have been made possible mainly by institutional reforms, including the transformation of inefficient shirkats (agricultural cooperatives) into private farms, the development of private initiatives in food storage, processing and distribution, the establishment of the Arable Land Amelioration Fund to maintain and improve the quality of farmland, and so on. Beside of the measures aimed at expanding the output and providing the access to food, policies on improving the nutrition of population were of utmost importance. These policies are mainly aimed at preventing the micronutrient deficiency and consist of flour fortification, salt iodization programs and measures on supplementing the vegetable oil with vitamin A and retinol. On the whole, Uzbekistan's food policy proved its effectiveness and averted the threats to the nation's food security. A number of key elements of Uzbekistan's food security strategy, such as targeted support of young children and women at the time of pregnancy, distribution of assets to households, integration of food security programs with the national healthcare system are now considered as internationally accepted best practices.

2 Research Questions and Methodology

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. Expected changes in the demographic pattern, growth of personal income and related transformations of the lifestyle and behavioral stereotypes will eventually lead to the substantial increase in demand for food products and transform people's food consumption pattern. On the supply side, climate change as well as the accelerated transformations and rapid industrialization could augment negative anthropogenic impact on the environment, affect water supply, quality of land, thus, influencing the crop yield and productivity in agriculture.

Ensuring food security, therefore, will require more complex approaches, policies and tools. Therefore, in order to ensure the nation's food security in the long term more complex and comprehensive approaches and policies need to be implemented. Food security should be considered as an integrated issue incorporating three key dimensions: (1) food availability; (2)

access to food; and (3) balanced and high quality nutrition. The principal benchmarks of food policy should address these three key areas.

Forecasting methods should go beyond the extrapolation mainly based on the assessment of the current situation. Instead, it is important to implement foresight methodologies, capturing the effects of social and economic transformations, climate change, development of institutions and other transformative processes that will take place by 2030.

Within the project estimations and evaluations are made taking into account the following dimensions:

- Demographic trends characterized by two processes: growth in the number of population and transformation of the age structure of the population;
- Growth of personal incomes and social transformations;
- Climate change (effect on the quality of land, effect of the availability of water for irrigation etc.);
- Technological changes;
- Regional context;
- Impact on associated industries (multiplier effects).

3 Results and Discussions

Based on the results of the analysis, the following strategies are suggested:

3.1. Availability of Food

The first goal is to ensure the availability of the required amount of food. For this purpose the projections on consumption and production and the expected shortages for the basic food items in 2030 were estimated. The following strategies are suggested to ensure the availability of food by 2030.

3.1.1. Land Management

a) Altering cropping patterns and production structure of food crops with the focus on the products where Uzbekistan has a comparative advantage.

Abolishing cultivation of cotton and grain on low-yield lands will enable to significantly enhance average crop yields, harvest and exports, margins for farmers, and radically improve the system of mutual settlements in the economy.

Hence, if the cultivation of grains is reduced by 42,000 hectares on rainfed lands and instead this land is used for cultivating fruits, the average yield of fruits could be increased from 10 to 20 tons per hectare during 2012-2030.

Similarly, if cultivation of cotton on low-yield lands is reduced by 60,000 hectares in favor of vegetable crops, the average yield would increase from 30 to 48 tons per hectare, while implementing intensive methods of horticulture. Total gain for the economy can amount to USD 4.8 billion. Given the prospects of job creation related to processing of agricultural food crops, additional 133,600 jobs will be created.

b) Agronomic and Agrotechnical Measures and Introduction of Modern Agrotechnologies

Technical measures include land rehabilitation and amelioration. The land area in need of rehabilitation is 1,550,000 hectares, whereas 782,000 hectares are in need of soil amelioration. Agronomical and cultural activities (building up organic matter in the soil, balanced plant nutrition, silvicultural reclamation) are required on all irrigated lands.

In order to increase yields in plant production and productivity in livestock farming, it is essential to create incentives for introduction and use of modern agrotechnologies. It would also be appropriate to introduce the system of laser-leveling, as a result of which mechanization costs can be reduced by 14%, use of labor – by 23%, water use – by 30%, irrigation costs (electricity, pumps) – by 27%, respectively, and yield (of wheat) can increase by 400 kg per hectare. In general, profitability will go up from 15% to 22% in the first year, and up to 37% in the second year (2).

Expansion of biodiversity and further diversification of agricultural food production are important in increasing efficiency in the use of resources and in gaining higher yield without negative impact on the ecosystems and consequently on the well-being of future generations. In this context, in addition to the conventional crops, it is appropriate to consider prospects of growing unconventional crops (e.g. pistachios). Creation of industrial pistachio plantations can be an effective alternative to the existing system of land use in the piedmont rain fed lands. For instance, according to the results of pilot projects, cultivation of pistachios in the piedmont rain fed lands is 50-time as profitable as cultivating wheat on these lands, whereas cattle grazing for the entire period accounts for merely 4.5% of the profit of cultivating pistachios during the same period.

As a result of these measures, the area of lands with salinization levels above the average will be reduced from 804,000 to 172,000 hectares in 2030. 81% of irrigated lands will be covered by amelioration measures by 2030 and the rating for land productivity will go up to “good” and “high” on 93% of irrigated lands. This will create favorable environment for the higher yield of crops and their overall harvest volumes.

3.1.2. Efficient Use of Water Resources

a) Significant expansion of water-efficient irrigation methods by 2030 include drip irrigation systems in the area of 100,000 hectares and creation of intensive farming zones in areas of piedmont and mountainous zones where the soil is not affected by salinization. Set up of drip-irrigation on 100,000 hectares requires investments in the amount of USD 455.4 million. This will enable to reduce the use of mineral fertilizers by 30% thus contributing to the reduced food production costs, and help address the issue of soil degradation. At the same time, yield of crops is estimated to increase by 40% (3).

b) Enhancing efficiency of irrigation systems up to 0.74 and maintaining sustainable use and maintenance of irrigation and drainage infrastructure. It is important to re-use collector and drainage waters for irrigation by mixing with irrigation water and alternating “freshwater-return water - freshwater” scheme. Transition to the intensive methods of water use will enable reduction in total demand for irrigation water by 2030. Planned range of measures in the framework of intensive water use will enable to cover the deficit of water resources for irrigation already by 2025.

3.2. Access to Food

Achieving the second goal of food security — ensuring access for the entire population to vital and safe foods — requires the following steps:

(1) Institutional reform and optimization of the size of farms in the agrarian sector. An increase in the size of farms will help increase the efficiency of food production. For example, in order to achieve economies of scale, the size of livestock farms must be increased to at least 1,000 head of livestock; vegetable growing farms to 85 hectares; and fruit growing farms to 40 hectares (4). In the process, production management at the farms must also be reformed. For livestock farms, three levels of enterprises must be consolidated: the network of purebred

livestock farms and cow-calf operations; the network of feedlots for intensive fattening; and slaughtering and meat-processing plants with high-tech meat-processing facilities. Intensive-farming methods must be implemented for fruit- and vegetable-growing farms.

Optimizing the size of livestock farms calls for the construction of large, covered, open-air fattening pens, the installation of appropriate equipment and the development of the necessary infrastructure. This will require an additional investment of \$929.6 million. As a result of farm-size optimization, the productivity of livestock farms will increase by 35%.

2) Creating an efficient system of purchase and procurement, distribution, processing and sales of agricultural food products. The gain from expanding the size of fruit- and vegetable-growing farms will depend heavily on improving the efficiency of the product storage, procurement and distribution system. This has certain requirements:

(a) Above all, it is important to create a system that will ensure access to food products throughout the year and will reduce seasonal fluctuations in food prices. A key part of this effort is establishing an efficient storage system for fresh and processed foods. This will require a major increase in refrigeration capacity, to 5.8 million m³. by 2030 from the current 1.1 million m³, which is well below today's required level of 2.9 million m³. This means that, in order to reach the optimum level before 2030, capacities will have to be expanded by 4.7 million m³. This will enable farm enterprises to make deliveries throughout the year and reduce seasonal price fluctuations, thereby improving consumer access to food products at more stable prices throughout the year. An efficient storage system will reduce product loss by 30%. The construction of additional refrigeration facilities will require an investment of \$1.4 billion. The total gain from creating this system will be \$2.1 billion. In other words, benefits from the elimination of food waste due to the lack of an efficient storage system will exceed the necessary investments needed to construct cold storages. In addition, setting up the production of cold storages in Uzbekistan will generate a multiplier effect in other sectors totaling \$2.4 billion.

(b) A crucial task is to create an efficient food-processing system. Considering that Uzbekistan will join the group of upper middle income countries by 2030 and that lifestyle, behavioural stereotypes and consumption patterns will change accordingly, the proportion of processed foods are expected to increase for a host of products. In order to keep up, the share of processing must grow to 30% for meat (from the current 6.9%); 50% for milk (11%); 30% for fruits and vegetables (13.3%); and 35% for grapes (15%). Attaining these processing levels will require additional investments totaling \$4.3 billion. The return on the investment in

the food processing industry will be 15%, or \$600 million, which means that the equipment will recover its costs in six-and-a-half years. This will create an additional 67.3 thousand jobs, both in the food-processing industry itself and in allied sectors.

(c) Another important element in ensuring food accessibility is the creation of an efficient sales, marketing and distribution system. In this connection, institutional reform and the major increase in the size of livestock-breeding and fruit- and vegetable-growing farms will necessitate reforming the value chain system. Specifically, in order to set up a smoothly operating network and minimize transaction costs between the production, distribution and consumption of agricultural products under the new conditions, the emphasis should be shifted from sales at bazaars to sales in grocery stores and large supermarkets. This will substantially lower transport and administrative costs and make it easier for farmers to interact with distributors by creating more opportunities to customize the assortment of farmers' products to market requirements. The pasteurized milk model shows that merely setting up an efficient production and distribution system will reduce costs by 41%. A shift to supermarkets will also help to ensure food safety by providing for the necessary inspections of products for sale.

Based on Uzbekistan's long-term development goals, by 2030, 70% of retail food sales must take place in stores and supermarkets, as opposed to the current figure of 37%. This will require 549,8 thousand m² of total floor space for supermarkets and stores, meaning that an additional 346,4 thousand m² (about 430 supermarkets) will have to be built.

3.3. Nutrition

The third goal of food security is to maintain balanced and high-quality nutrition in order to improve the nation's gene pool. An improvement in nutrition requires that dietary guidelines be optimized. Providing a high quality diet in accordance with these guidelines will significantly improve health indicators. In addition, benefits will accrue from a medium- and long-term enhancement in the quality of human capital. For example, an improvement in children's health through better nutrition will help improve academic performance and later ensure higher labour productivity, thereby contributing to economic growth. A reduction of child and infant mortality will also help to expand the working-age population in the future and thus contribute to the nation's GDP. The value of these benefits is estimated at \$1.36 billion a year.

The improvement in the quality and makeup of people's diets and the resulting enhancement of the nation's gene pool will generate additional benefits. The principal tools for achieving these results are the following:

(1) The implementation of programs to improve the nutrition of pregnant women, breastfeeding mothers, and children under the age of five. These programs will require an investment of \$835.2 million. The nutrition provided under these programs must contain calcium, protein, iron, vitamin groups A, B, C, and so on.

(2) Implementation of dietary standards and guidelines (including the content of micro-elements and necessary nutrients, monitoring of toxic substances, various additives, dyes, flavourings, emulsifiers and process requirements for preparation and transportation) and the development of institutions to monitor food quality. Specifically, it would be helpful to introduce a food-safety management system in accordance with the international standards of Series ISO-2000 and to ensure wide application of the FAO/WHO international food standards (the Codex Alimentarius). This will require an additional investment of \$257.8 million.

(3) Raising public awareness and the dissemination of the necessary information about healthy eating in order to improve the dietary model for households.

References

- 1) Estimations based on the data of State Statistics Committee.
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- 3) Data of the Ministry of Economy.
- 4) Estimations based on the FAO dataset