ECFS Eurasian Center for Food Security

Food Security in Eurasia 2017

Case studies

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Foreword

Socio-political, natural, and economic factors define the development of the Eurasian region. Since the demise of the Soviet Union, independent Eurasian countries face challenges related to organizing production, establishing trade relations, and building a resource base that can support the development of agriculture. Some countries, especially in Central Asia, need to ensure food security. This is explained not only by their natural and social features; ties that had long existed between the countries in the Soviet era and ensured balanced economic relations were broken when the USSR divided. Moreover, countries of the region each possess different legacies in terms of their industrial development, trade capacity, and access to markets.

The list of food security challenges is extremely long. It includes insufficient and volatile food output in some economies, which makes them heavily dependent on imported goods; poor effective demand coupled with food price hikes; and a lack of access to affordable food for some populations. Inadequate food quality is another crucial issue. The situation is aggravated by natural factors—land degradation, frequent droughts, and floods causing mudslides, which further undermine the agricultural capacity of these countries.

To make the general public and decision makers better aware of these challenges, the Eurasian Center for Food Security (ECFS) and the World Bank has initiated a series of research projects (case studies) to analyze key food security issues in selected countries of the region. This volume continues the series and covers the Kyrgyz Republic, Russia, Tajikistan, and Uzbekistan.

Each country addresses food security through a set of policy measures implemented by different levels of government. Government policies and actions, however, should be backed by solid evidence regarding each particular challenge. The case studies presented in this series serve as a useful and reliable tool to inform policy recommendations dealing with specific food security issues.

This volume comprises six cases covering some important food security issues in the Eurasian region. Two case studies on the Kyrgyz Republic address relevant issues in breeding and seed production and review possible improvements in this area. Food system shocks and possible ways to address them are discussed. The latter include better agricultural insurance, establishment of a fund to provide support to vulnerable populations, and ways to boost agricultural productivity and efficiency.

One important way to ensure food security in Uzbekistan is to mitigate the risk of droughts. Key measures here include insurance; the more efficient use of water by cleaning, repairing, and maintaining irrigation and drainage assets; breeding drought-resistant crop varieties; and introducing water-saving irrigation techniques.

In addition, pricing with respect to a strategic crop—wheat—in Uzbekistan and food in general in Tajikistan is discussed. For wheat in Uzbekistan, the study aims to identify and justify the most important policy options to better respond to wheat price changes. For Tajikistan, a set of stabilization measures is considered that require designing and approving a long-term strategy to main-

tain food price at optimal levels, a food assistance program for the poorest population, a roadmap to developing agricultural clusters, and improvements to the mechanism of lending and providing incentives to farmers as well as price monitoring and food security indicators.

A study of organic agriculture in Russia has produced some interesting insights. This sector is in its formative stage and is emerging; barriers to its development include the lack of relevant regulatory framework and the lack of a food certification system. The country also needs to develop a system to support distribution of, and access to, organic farming products.

This publication aims to provide tools that can help address the policy issues that are paramount to ensuring the food security of the region. The cases in this volume target specialists in such fields as agriculture and sustainable nature management, public agencies and government authorities, nongovernmental organizations, professional and for-profit organizations dealing with food security, and farmers and entrepreneurs. They will help to inform sound policy decisions in each of the areas under review.

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Development of Organic Agriculture in Russia

Yulia Mitusova, Anna Buyvolova

Executive Summary

The goal of this case study is to suggest policy options to facilitate the development of organic agriculture in Russia.

The organic sector in Russia has been steadily growing since the beginning of 2000s. The amount of land used for organic agriculture almost doubled in 2014–15, and as of 2015 amounted to a total of 385,000 hectares of certified organic land. At the same time, the organic market has grown 10 times in value over the last 15 years. However, despite the overall positive dynamics, Russia's organic sector remains underdeveloped compared to leading countries in organic production and consumption. For Russia to become a leading producer of "ecologically clean and high-quality food," as the president has declared it should, policy interventions aimed at facilitating the country's development of organic agriculture are needed.

The development of organic agriculture in Russia is constrained by a number of **policy issues** linked to (1) ***institutional framework*** conditions, such as the recognition challenge of organic products, the absence of a national data collection system, and the lack of infrastructure necessary for implementing organic regulations; (2) ***domestic demand***, such as low consumer purchasing power, competition from other "healthy" products, and trust-related issues; (3) ***production***, such as few organic producers, the absence of state support for organic agriculture, and the lack of specialized education and research programs; and (4) ***export***, including the lack of harmonization of Russian organic standards with international standards and the lack of export promotion support for Russian organic producers.

The **key stakeholders** operating in Russia's organic agriculture sector include organic producers, retailers, consumers, associations (representing organic producers), government agencies, and scientific and educational institutions.

Policy measures aimed at developing organic agriculture in Russia discussed in this case study are intended to be implemented in the short term and are expected to have an immediate impact on the sector. These policy options are divided into three groups: (1) ***enabling measures*** that stimulate supply and demand of organic products, including developing an institutional framework for the organic sector and establishing a data collection system; (2) ***push measures*** that stimulate the supply of organic products, including offering research and extension services and introducing incentives for organic producers and processors; and (3) ***pull measures*** that stimulate demand of organic products, including promoting public awareness about organic products and introducing a national logo for organic products.

The policy options suggested in this case study are based on the assumption that the goal is first to develop the domestic organic market, and second to grow the export potential of Russia's organic sector. However, since less than 1 percent of Russia's population consumes organic products regularly, the current market is estimated to be limited. Additional data are necessary (1) to determine the potential of the domestic market for organic products and consequently (2) to decide on the best approach in the longer term: focusing on developing the domestic market or growing exports of organic products.

Background

Definition and Principles of Organic Agriculture

The concept, theoretical framework, and methodological approach for organic agriculture were initially introduced in Europe and the United States in the beginning of the 20th century. The pioneers of the organic movement were the following scientists: A. Howard, R. McCarrison, F. H. King, W. Northbourne, E. Balfour, J. I. Rodale, and L. Bromfield (Vogt 2007),

who tried to find sustainable solutions to soil erosion and depletion, decline of crop varieties, low quality of food and livestock feed, and rural poverty (Kuepper 2010).

The term *organic agriculture* is widely used in international literature and documents in most English-speaking countries. The following equivalent terms are used in European countries: *biological* or *bio* in France and Germany and *ecological* and *eco* in the Czech Republic, the Netherlands, and Poland. Discussions over the meaning of *organic* are still underway; however, this term is internationally accepted and widely used all over the world.

The most commonly used definitions of *organic agriculture* have been given by the following organizations: the International Federation of Organic Agriculture Movements (IFOAM), the Food and Agriculture Organization of the United Nations (FAO), the United States Department of Agriculture (USDA), and the Research Institute of Organic Agriculture (FiBL). All these definitions agree on the restrictions on the use of chemically derived fertilizers, pesticides, genetically modified organisms (GMOs), and other synthetic materials in farming systems. Organic agriculture is trying to meet the increased needs of a growing population without the risk of losing yield in the longer term, while at the same time maintaining natural processes and biological cycles in the ecosystem.

For the purposes of the current case study, the following definition by IFOAM is used (IFOAM 2017a); this is very similar to the definition of organic agriculture in Russian national standards (see the section on "Public Regulation and Certification of Organic Food Products" later in this study): *"**Organic Agriculture** is a production system that sustains the health of soils, ecosystems and people. It relies on ecological processes, biodiversity and cycles adapted to local conditions, rather than the use of inputs with adverse effects. Organic Agriculture combines tradition, innovation and science to benefit the shared environment and promote fair relationships and a good quality of life for all involved."* In this case study the term ***organic products*** is used to define food products produced in the organic agriculture system.

The principles of organic agriculture are now considered to be the basis for the development of this production system worldwide. According to IFOAM, these four principles are.

- ✓ **Health** – organic agriculture should sustain and enhance the health of soil, plant, animal and human as one and indivisible
- ✓ **Ecology** – organic agriculture should be based on living ecological systems and cycles, work with them, emulate them and help sustain them.
- ✓ **Fairness** – organic agriculture should be built upon relationships that ensure fairness with regard to the common environment and life opportunities.
- ✓ **Care** – organic agriculture should be managed in a precautionary and responsible manner to protect the health and well-being of current and future generations and the environment (IFOAM 2017c).

Over the last decade, the concepts of *organic food* and *organic agriculture* have become more common in Russia, followed by growth of sales and production of organic products.

Organic Agriculture in Russia: Certified Organic Land, Domestic Producers, and Retailers

As of 2015, 385,140 hectares were certified organic in Russia (including areas in conversion). Over the previous 10 years (2005–15) organic agricultural land area has increased significantly, from 6,900 hectares of land reported under organic management in 2005 (IFOAM 2005, p. 14). In 2014–15 Russia experienced a

rapid growth of organic agricultural land area: 139,292 hectares were added over a two-year period. At the same time, organic land in Russia accounts for only a 0.2 percent share of total agricultural land in the country (Willer and Lernoud 2017, pp. 42, 46). However, not all certified organic land in Russia is under cultivation. The certification process of organic land takes around three years. Therefore some farmers do not start using the land until they can produce and sell certified organic products (once the three-year conversion period is over).

The exact number of organic producers is not available, although according to various estimates this number is between 70 and 90 producers (Mironenko 2016; Schott and Sanders 2016), which is significantly lower than, for example, in India (which has 585,000 organic producers), Germany (25,078), or the United States (14,871) (Willer and Lernoud 2017, pp. 42, 46). Over 60 companies in Russia have international organic certificates from the European Union (EU) and the National Organic Program (NOP) of the United States.[1] Most organic farms in Russia are small and medium sized (50–1,500 hectares).[2] However, most of the organic production in Russia is carried out by large holding companies that may unite from 3 to 11 companies under their umbrella. In addition, some of the companies that are part of the holding may already produce organic products, while others may be in the process of conversion or thinking about transitioning to organic production.

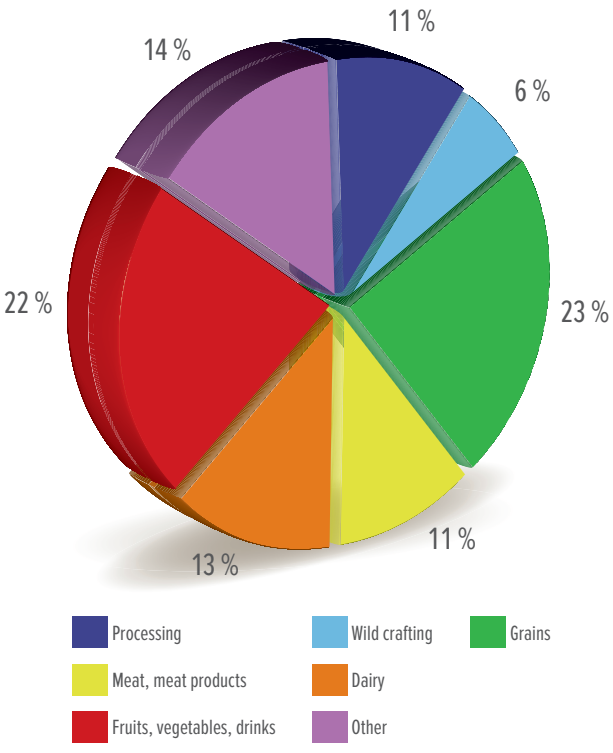
Organic farms in Russia produce mostly grains (23 percent) and fruits and vegetables (22 percent). Dairy products account for 13 percent of the organic production in Russia, followed by meat and meat products at 11 percent (Figure 1).

Geographically most of the producers are located in the European part of Russia—in Yaroslavskaya oblast, Saratovskaya oblast, Rostovskaya oblast, Krasnodarskiy kray, and Moskovaskaya oblast, among others (Figure 2).

The largest organic producers include agricultural holdings *Agrivolga* (brand *Ugliche pole*), *Arivera*, and *Savinskaya Niva*, which are also present on the retail side and have their own specialized stores located primarily in Moscow and St. Petersburg. The retail channels for organic products include the following:

- ✓ Supermarkets (mostly "premium" stores)—such as *Azbuka Vkusa* and *Globus Gurme*. There is no special shelf for organic food in such stores and organic products are placed in the "healthy foods" section of the supermarket.

Figure 1: Organic Production by Sector

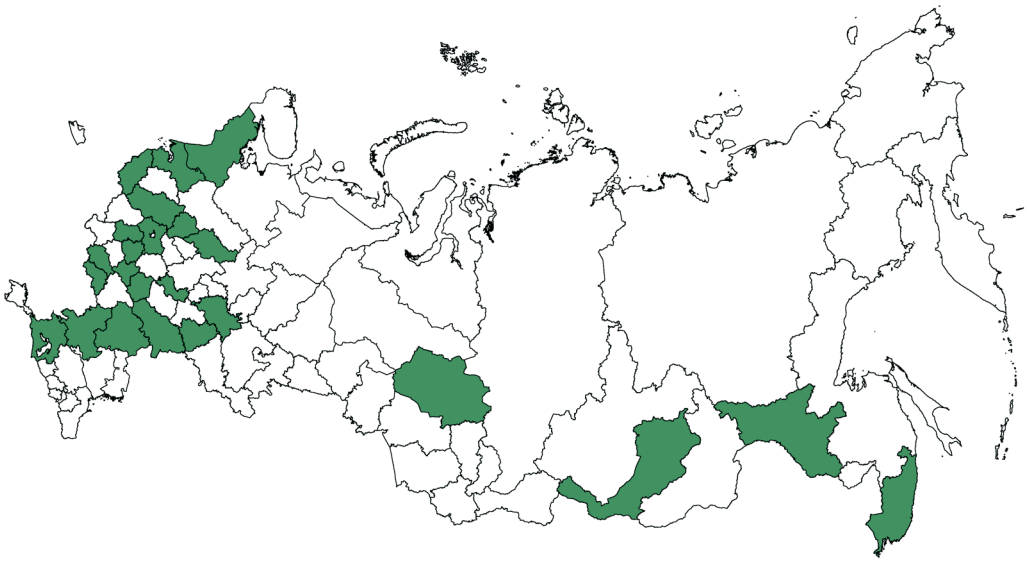


Source: National Organic Union 2016.

[1] Kseniya Firsova, Deputy Director of the Ecological Union (http://ecounion.ru/), interview with the authors, August 2017. The NOP is a regulatory program housed within the USDA Agricultural Marketing Service.

[2] Sergey Korshunov, Chairman of the Board of the Union of Organic Farming (http://sozrf.ru/), interview with the authors, August 2017.

Figure 2: Organic Producers by Region



Source: Union of Organic Farming & National Organic Union 2017.

- ✓ Small health food stores—for example, *Gorod Sad* and *LavkaLavka*. Sales are based on healthy diets, healthy lifestyle promotion, and face-to-face marketing. Consumers' attention is not focused on specific labels; it is rather on the concept of a healthy lifestyle. There is no significant differentiation between organic and other "healthy" products at this kind of store.

Figure 3: Shelves with Organic and Nonorganic Products in Biostoria

Source: Yulia Mitusova 2017.

Note: The red circle highlights an example of labels and prices for organic products; the blue circle highlights nonorganic products.

- ✓ Specialized stores selling organic products—for example, *Organic Market* and *Biostoria*. Sales are focused primarily on organic products and the price tags reflect whether the product is certified organic or not (Figure 3). Most of the products sold at these stores are imported. Domestic products are primarily represented by perishable food products (milk, meat) and cereals.

- ✓ Online stores such as *Biostoria* (http://store.biostoria.ru/) and *Arivera* (http://www.arivera.ru/), where products are sold directly from producers, and a large number of online stores that sell healthy, eco, and bio products—for example, *Ecotopia* (https://ecotopia.ru/). Online sales make organic food more accessible to consumers throughout Russia.

The geography of organic production and retail is linked to the location of most of the consumers for these products. Because in Russia organic products are two to five times more expensive than conventional food products, the largest markets for organic products are Moscow and St. Petersburg (where incomes and purchasing power are higher than in other cities). These markets account for over 70 percent of total sales (Mironenko 2016). In addition, organic products usually have a shorter shelf life than conventional products (for example, organic milk has a shelf life of three to five days) and cannot be transported long distances.

The Market for Organic Products in Russia: Size, Growth Rate, and Domestic Consumption

The Russian market for organic products is still immature and currently in an early growth phase. Over the last 15 years, the market has grown 10 times in value: from US$16 million in the early 2000s to US$160 million in 2016 (Mironenko 2016). While initially 100 percent of the market consisted of imported products (primarily from France, Germany, and Italy), in 2016 the value market share of domestic certified organic products amounted to 10 percent of the total market (Mironenko 2016).

In 2010–14 the market for organic products was growing in value at an average rate of 10 percent (Mironenko 2016). For a number of reasons—including the economic recession in Russia that led to a decline in real incomes, as well as the food embargo introduced in 2014—market growth in 2015–16 was more moderate and averaged an annual 4 percent growth rate according to the National Organic Union's estimates (Mironenko 2016). However, despite its positive growth rate over last decade, Russia's value market share in the global organic products market is only 0.2 percent.

Because of limited data on the organic market, it is difficult to provide an accurate estimate how the market will develop in the future and how domestic consumption will change.

Public Regulation and Certification of Organic Food Products

Three national standards (GOSTs) currently regulate the production and distribution of organic product in Russia:

- ✓ GOST R 56104-2014 "Organic Food Products: Terms and Definitions," dated September 10, 2014, provides definitions of *organic agriculture, organic production process, organic food products,* and *organic certification* and *inspection.*
- ✓ GOST R 56508-2015 "Organic Products: Production, Storage and Transportation Rules," dated June 30, 2015, provides detailed guidelines on organic production (including crop growing, animal husbandry, beekeeping, and aquaculture); conversion to organic production; organic feed production; collecting, packaging, transporting, and storing organic products; and labeling organic products.
- ✓ GOST R 57022-2016 "Organic Products: Guidelines for Voluntary Certification of Organic Production," dated August 5, 2016, outlines rules for voluntary certification of organic production.

In addition, an interstate standard (GOST 33980-2016/CAC/GL 32-1999, NEQ "Organic Products: Rules for Production, Labeling and Sale") provides a definition of organic products and outlines rules for production, processing, labeling, and distribution. This interstate standard regulates organic production in the Commonwealth of Independent States countries and will become effective in January 2018, replacing all of the three Russian national standards. At this point, however, besides Russia, only the Kyr-

gyz Republic and Tajikistan have adopted the interstate standard on organic production.

All of these standards provide rules for the production, storage, and transportation of organic products of plant, animal, and microbial origin, as well as aquaculture products in their natural or processed form that are used as food, animal feed, or planting material and seeds.

Currently, the draft law "On Production and Distribution of Organic Products" is in the State Duma and is likely to be passed by the end of 2017.[3] The law introduces the key concepts—such as organic products, organic production, and distribution. It also and prohibits labeling and distributing organic products that have been produced at a facility that has not been certified organic. In addition, the law requires obligatory accreditation of certifying companies with the respective state agency, establishes a national register of organic producers, and introduces a national common logo for organic products.

Two types of companies certify organic producers in Russia: domestic and international. Local Russian certification companies certify organic producers in accordance with their own voluntary certification systems registered with Rosstandart.[4] These local voluntary certification systems are, in most cases, based on adapted translations of EU organic standards. However, since the introduction of GOST R 56508-2015, certification companies have been using this standard in the certification process. Three Russian certification companies currently operate in the market: Organic Expert (http://organik-expert.ru/), the Ecological Union (http://ecounion.ru/) with its own ecolabeling program Vitality Leaf, and Eco Control (http://eco-control.ru/). In addition, 15 international certification companies have EU permits for conducting inspection work in Russia.[5] These companies include ABCert AG (http://www.abcert.de/) and Lacon Institut (http://www.lacon-institut.com/) from Germany, Bio Inspecia (http://www.bio-inspecta.ch/) from Switzerland, Ecocert (http://www.ecocert.com/en) from France, and Ecoglobe from Armenia (http://ecoglobeorganic.com/), among others.

The certification landscape of organic producers in Russia is likely to change once the law "On Production and Distribution of Organic Products" is passed and all certifying companies are required to get accreditation from Rosaccreditaciya. Currently, none of the certifying companies operating in Russia have this accreditation (Mironenko 2016), because—according to the existing regulations—such an accreditation has not been necessary.

Policy Issues

Even though organic agriculture has been developing in Russia over the last decade and local production has increased significantly in the last 15 years, a number of policy issues are linked to the institutional framework needed to develop organic agriculture, as well as issues related to the domestic demand, production, and export of organic products.

Institutional Framework–Related Issues

In December 2015, Russia's President Vladimir Putin announced his intention to become the world's largest supplier of "ecologically clean and high-

[3] In this case study, the analysis is based on the assumption that the law will be passed and no recommendations for the legal framework for the organic sector in Russia are provided.

[4] The Federal Agency on Technical Regulating and Metrology, known as Rossdardart, serves as the country's national standardization body. See http://www.gost.ru/wps/portal/en for more information.

[5] See http://rosorganic.ru/files/perechen-zarub-inspection.pdf for details (in Russian).

quality food" (Interfax 2025). However, not much has changed in terms of developing framework conditions or policy measures to support the sector since that announcement. An institutional framework for expanding organic production and consumption is necessary to meet this goal. Three major areas need to be addressed:

- ✓ *Challenge of defining and recognizing "organic" products.* Even though national standards clearly define organically produced food,[6] consumers do not always have a clear understanding of what the term *organic* actually means or how organic products differ from other types of food products, which are labeled "eco," "bio," or "natural" and often sold next to each other in supermarkets and other retail outlets. In addition, there is no recognized label that is used for organic products, and it is a challenge for consumers to differentiate between organic and nonorganic products.

- ✓ *Absence of a national data collection system.* First, the Russian national statistical agency Rosstat does not collect any data on organic agriculture. Second, there is no open database of organic producers, which makes finding information on certified producers a challenging task. Third, there is no separate customs commodity code for organic products, which makes it difficult to track the export and import of organic goods.

- ✓ *Absence of infrastructure necessary for the implementation of the law on organic agriculture.* Even if the law is passed during the next few months, the role of government and private sector agents in the certification, inspection, and overall regulation of the sector remains unclear. The following questions arise: What agency is going to maintain the registry of organic producers? Who will monitor and regulate organic production and distribution—Rosselkhoznadzor, which conducts veterinary and phytosanitary control, or Rospotrebnadzor, which provides oversight and control in the space of consumer rights' protection? Will the role of private certifying companies change after the law is passed? Unless the respective institutional infrastructure is developed and responsibilities are allocated to specific agencies and organizations, the law is likely to become a mere declaration and will face implementation challenges.

Domestic Demand–Related Policy Issues

In Russia, less than 1 percent of the population consumes organic products regularly (Mironenko 2016), and consumption is primarily concentrated in Moscow and St. Petersburg. The demand for organic products in Russia is limited for the following reasons: (1) low consumer purchasing power; (2) competition from products labeled "ecological," "farmers'," "healthy," and so on that may be perceived as alternatives to organic products; and (3) trust as a factor limiting growth of the market for organic products.

- ✓ *Low consumer purchasing power.* In Russia, organic products are priced at a premium, which makes them affordable to only a limited group of the population. Unless organic products become more affordable or living standards and incomes in Russia increase, the market potential for organic products will remain limited. At the same time, in the European Union, where the organic market share and per capita consumption are highest in the world (Willer and

[6] Organic food is a product in its natural or processed form manufactured from raw materials of plant or animal origin grown in the organic agricultural production areas, as well as forest, bee and fish products grown, processed, certified, labeled, preserved and marketed in accordance with the rules of organic production, meant for human consumption in their processed or unprocessed form (GOST R 56104-2014) (translated from Russian).

Lernoud 2017), organic products cost only 15–50 percent more than conventional products (Mironenko 2016).

- ✓ *Competition from other "healthy" products.* Over 80 percent of organic products' consumers make their choice for health-related reasons: because they are concerned about the health of their family and kids, lead a healthy lifestyle, or have certain dietary restrictions (Mironenko 2016). A wide range of other "healthy" products that are labeled "eco," "bio," and so on are in the market; they are often perceived as alternatives to organic products.

- ✓ *Trust as a limiting growth factor.* On the one hand, trust is one of the main factors for determining consumer loyalty in the organic market: consumers buy from producers they trust. On the other hand, trust becomes a limiting growth factor and a barrier to entry for new producers who are unknown in the market. Additional data are needed to determine whether consumers place more trust in the producer or the label (proof of certification); however, stakeholder interviews indicate that more trust is with the producer than with the label. There is no evidence that consumers have more trust in foreign organic products than in locally produced ones (individual or focus group interviews need to be conducted in order to have a more accurate assessment), but this could be the case because (1) foreign organic brands have been on the market longer and are thus better known; and (2) foreign organic labels, such as the EU organic logo, are more recognizable.

Production-Related Policy Issues

Local organic production in Russia is limited, and as market data show, over 90 percent of organic products currently available are imported (Mironenko 2016). The existing production capacity in Russia's organic sector is limited primarily as a result of the small number of producers, which is not comparable to the world's leading organic producers. In addition, the absence of state support for organic agriculture, the lack of educational programs, and limited research and development constrain rapid production growth.

- ✓ *Few local organic producers.* Even though a significant amount of land in Russia could be used for organic agriculture, the number of organic farms is very low compared with the number in other countries. In addition, organic processors account for only 11 percent of all types of organic companies in Russia (Mironenko 2016). The limited number of organic producers and processors is an obvious constraint to the development of the sector. There are several possible reasons for the low number of organic farms in Russia. First, the demand for organic products is limited and producers do not see a big enough market for their products. Second, access to distribution channels is a challenge. In order to get access to larger supermarkets, producers need to supply a certain volume and mix of products. For many organic producers this is a challenge, because both their production volume and their types of products are limited. Third, the absence of a regulatory framework (law) is a barrier. Companies do not want to enter a space that is not regulated.

- ✓ *Absence of state support for organic agriculture.* The development of organic agriculture is not mentioned as a priority area in Russia's Agriculture Development Program 2013–2020, nor is there a specific program on the development of organic agriculture in Russia. There are no grants or subsidies for organic farmers or any other incentives for farmers to convert their farms to organic production. International experience shows that government support can play a critical role in the growth of organic agriculture on a country level. For example, in 1992 agri-environmental programs providing a

unified framework for supporting conversion to and maintenance of organic production across the European Union were adopted. An important part of these programs were so-called organic area payments—fixed subsidies per hectare given to organic producers depending on the kind of crops they grew. In 2001, the total budget support for organic farming in the European Union amounted to €520 million (IFOAM 2017b).

- ✓ *Lack of specialized educational programs.* There are over 50 specialized agrarian universities in Russia, but none of them have courses or programs on organic agriculture. At the same time, the results of a survey recently conducted by the Union of Organic Farming show that 23 out of 25 agrarian universities that responded to the survey believe that organic agriculture has potential in Russia. It is not clear though whether these universities will introduce courses on organic agriculture in the near future or not.

In the United States and Europe, which have the world's largest organic food markets, programs on organic farming are offered at a number of schools. In the United States, programs on sustainable agriculture and organic farming are offered at Oregon State University, Washington State University, and Cornell University (Chait 2016), among others. In Europe, two-year Master programs on organic agriculture are offered at Wageningen University in the Netherlands (http://www.mastersportal.eu/studies/1468/organic-agriculture.html); Aarhus University in Denmark (http://studyindenmark.dk/portal/7/22/21315); and schools in Germany, France, Austria, and Poland (ttps://www.uni-hohenheim.de/en/organic-agriculture-and-food-systems-masters).

- ✓ *Limited research and development.* Urs Niggli and Helga Willer introduced four stages of organic farming research at a conference in Denmark in 2001 (Danish Ministry of Food, Agriculture and Fisheries 2001): (1) pioneer farmers and scientists, (2) pioneer private research institutes, (3) organic farming chairs at universities, and finally (4) organic farming projects at state research institutes. According to this model, the development of scientific research on organic agriculture in Russia is in its initial stage.

At the global level, IFOAM has been facilitating dialogue between organic agricultural practice and research since 1972, and FAO lists 56 organizations in the world conducting research on organic agriculture.[7] Most of these organizations are based in Europe and the United States; none are located in Russia.

Organic agriculture is an innovative production system (Hoffmann, Probst, and Christinck 2007): it combines traditional methods, innovative technologies, and modern scientific and technical developments that are beneficial to the environment. The European Technology Platform TP Organics describes organic farms as "creative living laboratories for smart and green innovations" (Padel et al. 2010). In Russia several organizations—such as the Institute of Organic Agriculture (http://www.ioa.institute/), the Kuban State Agrarian University, the Russian State Agrarian University – Moscow Timiryazev Agricultural Academy, and Lomonosov Moscow State University conduct research relevant for organic agriculture (Емельянова and Новиков 2016, in Russian). However, it is not clear whether these research outputs are shared with organic farmers or if any of their research outputs are implemented.

Export-Related Policy Issues

The global organic market has been growing steadily over the last 20 years and is forecasted

[7] For the FAO's list of research and institutions, see http://www.fao.org/organicag/oa-relatedlinks/links-cat/research-and-institutions/en/

to continue growing. Its value has increased more than four times, from US$17.9 billion in 2000 to US$81.6 billion in 2015 (Willer and Lernoud 2017). Demand for organic products is concentrated primarily in the United States and the European Union, but more than three-quarters of organic producers are located in developing and transition countries (Willer and Lernoud 2017). Some countries—such as India, Mexico, and Tunisia—focus their domestic organic production almost exclusively on export. Russia too could focus its organic sector on exports; however, this is not happening yet and only around 5 percent of Russia's organic producers export their products.[8]

- ✓ *Presence of multiple organic standards in the world and limited harmonization of Russian standards with other countries' standards.* Russia has its own organic standards, which are based on EU standards. According to the National Organic Union, all three standards that currently regulate the organic market in Russia (GOST R 56104-2014 "Organic Food Products: Terms and Definitions"; GOST R 56508-2015 "Organic Products: Production, Storage and Transportation Rules"; GOST R 57022-2016 "Organic Products: Guidelines for Voluntary Certification of Organic Production") are based on translations into Russian of EU standards and norms. However, as the result of adapting GOST R 56508-2015 to Russian conditions, this standard has only a 70 percent similarity to EU standards, which can make it difficult to export Russian organic products. This means that, in most cases, companies need to choose whether they want to sell their products internationally and get organic certification from the European Union/United States/Brazil/Japan/China, and so on (depending on the export market), or domestically and make sure that their products are in line with Russia's organic certification standards and procedures. Dual certification may be too costly for most producers.

- ✓ *Absence of export promotion activities for Russian organic producers.* There are no export consultations, organized trade missions, assistance with partner searches in foreign markets, and so on that could help Russian organic producers explore opportunities in international markets. Such help is available in other countries. For example, the United Kingdom's Soil Association offers export support to its members;[9] so does the Organic Exporters Association of New Zealand,[10] and the U.S. Organic Trade Association.[11] In 2017, the Russian Export Center considered providing support to Russian organic producers at the main exhibition in the organic industry, BioFach 2018 (https://www.biofach.de/en).

Stakeholders

Producers

Producers need to understand consumers' product requirements and as a result develop production and marketing strategies in order to increase their sales and expand their presence in the market. Access to reliable and updated market data is critical for this purpose. Organic producers are also interested in allocating a separate shelf for organic products in stores in Russia, so that consumers could easily find and distinguish organic products from other "healthy" and conventional foods.

[8] Sergey Korshunov, Chairman of the Board of the Union of Organic Farming (http://sozrf.ru/), interview with the authors, August 2017.

[9] For details about the Soil Association, see https://www.soilassociation.org/certification/food-drink/business-support/exportsupport/

[10] For details about the Organic Exporters Association of New Zealand, see http://www.organictradenz.com/

[11] For details about the U.S. Organic Trade Association, see https://www.ota.com/resources/global-market-opportunities/trade-promotion

Companies operating domestically are interested in creating and promoting a recognizable logo for organic products in Russia, so that consumers could identify organic products easier. Companies exporting organic products are interested in the harmonizing Russian and international standards, so that locally produced organic products could be sold internationally.

Aspiring producers and processors of organic products are interested in obtaining consultations on what it will take to convert their farms to organic production, as well as in receiving subsidies and/or credits, particularly during the transition period.

Organic producers face the following challenges: (1) lack of public awareness—consumers do not differentiate between organic products and other "healthy" products; (2) the lack of qualified personnel and experts, because universities do not prepare specialists in the field of organic agriculture; (3) the lack of knowledge and experience in organic farming, which results in the concern of having to deal with certain production challenges without resorting to traditional remedies and solutions; (4) distribution and sales challenges (Nakaryakov 2017), (especially challenging for small-sized farms located far from the major markets for organic products, such as Moscow); (5) issues associated with products' processing (due to the limited number of processing companies); and (6) the small domestic market of organic seeds and fertilizers.

Retailers

Retailers play an important role in linking organic producers and consumers. They are interested in offering a wide variety of good-quality products with attractive packaging in their stores. Price is an important issue because even premium food stores need to have a margin on all the goods they sell. The right combination of product mix, quality, and price is what attracts consumers to a specific store.

The retailer faces the following challenges with organic food products: (1) limited categories of products are available, which are not sufficient to fill up a shelf in the store; (2) the price of organic products is high, which limits demand; (3) the volume of organic products is limited because organic producers usually have limited production capacity; and (4) organic products have special storage requirements.

Consumers

Organic food consumers are mostly urban residents 25 to 40 years old with stable high earnings. Women who buy food for their children and pay special attention to quality are among the most consistent clients of organic stores. Organic food is neither economically (because of its high price) nor physically (because of the limited number of stores) accessible for 99 percent of Russian citizens. In addition, consumers are not always aware of what "organic" means, which results in a lack of trust and reduces consumers' interest in purchasing organic products.

Associations

Organic associations are important stakeholders in the development of organic agriculture in Russia. The most visible associations in Russia are the National Organic Union (http://rosorganic.ru/) and the Union of Organic Agriculture (http://sozrf.ru/). Both are membership organizations; the National Organic Union represents mostly large organic producers certified according to EU standards or GOST R 56508-2015 and retailers that sell organic products; the Union of Organic Agriculture represents both organic producers, as well as other groups of "ecological" producers that are not necessarily certified organic.

These associations cooperate with all stakeholder groups at various levels: they work closely with pro-

ducers; take part in the development of organic legislation in Russia; collect market information; and actively promote the philosophy of organic production via interviews, press releases, presentations at conferences, and so on. Associations play a significant role in policy making because they are perceived as experts in organic agriculture and possess valuable information about recent developments in this area. In addition, organic associations can help increase awareness about organic products and become drivers of the organic movement at the initial stage of the sector's development.

Government Agencies

The government plays an important role in the development of organic agriculture primarily because it can design policy measures facilitating the growth of this sector. However, different government agencies can have different interests and varying levels of influence on the development of organic agriculture.

- ✓ **The Ministry of Agriculture of the Russian Federation**

In his speech at the St. Petersburg International Economic Forum this year, Russia's Agriculture Minister Alexander Tkachev said the following regarding the development of organic agriculture in Russia: "Russia has a competitive advantage—since 1990 the country has applied less chemical fertilizers, so there is a large amount of land suitable for organic agriculture. We have already prepared a document on organic agriculture, which will create a legal regulatory framework for organic food production" (Union of Organic Farming 2017).

So far the Ministry of Agriculture has been involved only in developing the basic legal framework for organic agriculture. If indeed Russia is to become "the largest world supplier of healthy, ecologically clean and high-quality food" (Interfax 2015), the Ministry needs to become more involved in designing enabling policy measures in partnership with other government agencies, in order to facilitate the sector's growth.

- ✓ **The Ministry of Finance of the Russian Federation**

The Ministry of Finance is an important government agency when it comes to the development of any sector of Russia's economy. The Ministry's goal is to have a sustainable budget policy, which involves increasing the efficiency of budget expenditures and earnings. Thus receiving stable and sustainable tax revenues is in the interest of the Ministry of Finance, and offering tax breaks and other financial benefits to organic producers might not be in line with the Ministry's goal of having stable budget earnings. At the same time, the Ministry is working on increasing the efficiency of budget expenditures; in order to allocate grants and additional financial support for organic producers and processors, somebody will have to provide evidence that this support is an efficient way to distribute state funds.

- ✓ **The Russian Federal Service for Surveillance on Consumer Rights Protection and Human Well-Being (Rospotrebnadzor)**

Rospotrebnadzor develops government policy on consumer rights protection and state sanitary and epidemiological guidelines. This agency is interested both in ensuring that consumers get accurate information about the products they are buying and in the safety of these products. Rospotrebnadzor plays an important role in the distribution of organic products (similar to role it plays in distributing other types of products on the market).

Scientific and Educational Institutions

Organic research in Russia is conducted by a small number of scientists and research institutions. The

scientific community is interested in getting funding to conduct systematic and comprehensive research and is in need of a mechanism to disseminate research results among organic farmers and other stakeholders.

Although organic producers mention a lack of qualified personnel as one of the challenges that organic farmers in Russia face, educational institutions do not offer programs or courses on organic agriculture. One the one hand, in order to introduce new courses on organic agriculture, they need formal recognition of organic agriculture as a separate field of study in the secondary and higher education system. On the other hand, they need to be sure that there is a stable and consistent demand for organic agriculture specialists, which is difficult to estimate given the limited market data.

Policy Options

International experience shows that the development of organic agriculture is a result of a mix of factors, including a well-functioning organic industry, stable market conditions, a positive public perception of organic products, a strong organic movement, and an enabling policy environment (Figure 4). Policies conducive to growth of the organic sector play a critical role in the sector development and research proves that they do matter a lot (Sanders, Stolze, and Padel 2011).

Usually specific policy measures are part of a more general strategic plan that provides the basis for policy development in the area of organic agriculture and outlines a strategic vision for the sector's development. For example, in the European Union, the European Action Plan for Organic Food and Farming (EAOP) provided overall strategic guidance for country-level policy development in organic agriculture. Developing a comprehensive framework of policy measures presented in the form of a *national program, strategy, or action plan* can help increase the effectiveness and efficiency of the adopted policies. In the case of Russia, a separate national program on organic agriculture or a phase in Russia's agriculture development program could increase the efficiency of the policy measures proposed in this section of the case study.

Based on the IFOAM approach to policy design for the development of organic agriculture, the government's role is primarily that of an enabler introducing "supporting measures to promote organic development," and policy design is done with a "public-private partnership and multi-stakeholder approach" (IFOAM 2017b). This approach allows a country to achieve a supply-demand equilibrium, which is critical to the development of the organic sector in any country. IFOAM has developed a wide range of policy measures aimed at supporting organic agriculture (see Annex 1). These measures are classified as "push"—encouraging the supply of organic products; "pull"—encouraging the demand for organic products; and "enabling"—affecting both the supply and demand.

Policy options discussed in this section are based on the policy development guidelines suggested by IFOAM; are aimed at addressing policy issues covered earlier in this case study; and are applicable for Russia, taking into account the existing framework conditions and stage of development of the organic sector. The decision-helping framework developed by IFOAM was used to identify the most suitable policy options for Russia's organic sector.[12] These policy options are a combination of the push, pull, and enabling measures aimed at enhancing the competitive position of organic agriculture in the domestic market by increasing awareness about organic products, in-

[12] See IFOAM's Decision Aid for Organic Policy-Setting & Strategic Action Plans: Choosing Relevant Support Measures, available at https://pgs.ifoam.bio/policy_decision/questionnaire

Figure 4: Factors Influencing the Development of the Organic Sector

Source: Based on IFOAM 2017b.

creasing productivity of organic farms, and reducing unit costs for locally produced organic products in Russia.

The overall goal of these policy options is to facilitate the development of organic agriculture in Russia. However, because of the scope of this case study, ***the focus of these options is primarily on policy measures that could be implemented in the short term and have an immediate impact on the sector***.

1. Policy options stimulating both supply and demand of organic products

a. Organic institutional framework

In order to ensure the further development of organic agriculture in Russia, it is necessary to assign specific roles to government and private sector agents in the organic sector.

Certification could be carried out by domestic and international private companies accredited by Rosaccreditaciya. The monitoring of organic production and processing could be carried out by Rosselkhoznadzor, which conducts veterinary and phytosanitary control in Russia. The monitoring of organic food distribution and sales could be carried out by Rospotrebnadzor, which provides oversight and control in the space of consumer rights protection. This kind of role distribution would increase ***organic producers'*** confidence in the sector development, ensure ***consumer*** protection, and set the basis for the institutional framework of the organic sector in Russia.

These roles need to be assigned in parallel with adopting the law "On Production and Distribution of Organic Products" (which is expected to pass by the end of 2017).

b. Data collection

Establishing a data collection system is highly relevant for all stakeholder groups and could be implemented in the short term. Reliable and up-to-date statistical data are needed for ***policy makers*** to design the institutional framework for organic agriculture development and identify the most relevant policy measures. High-quality data are also relevant for ***organic producers*** and ***retailers*** to forecast market growth, plan production, and analyze consumer needs. ***Scientific and research organizations*** need reliable data to conduct in-depth assessments of the organic sector and, as a result, identify research priorities.

Data collection could be launched in the form of systematic data collection, analysis, and storage on the national level, and conducted by state agencies, such as the Russian Federal State Statistics Service (Rosstat) and Rospotrebnadzor. In order to launch data collection, specific principles of data collection must be developed. First, data could be gathered on the regional level based on the general agriculture data collection methodology. Second, research institutions and associations could collect their own data in order to conduct independent research. Third, an open access online database of certified organic producers could be set up. Such a platform would benefit all organic stakeholders and make the sector more transparent by providing information on all organic producers, including location, certification, types of products, and so on. This platform should be user friendly and could become a useful tool for consumers where they can easily verify the certification of organic products.

Overall, the open data strategy would improve the organic sector's transparency and increase the level of trust toward organic products.

2. Policy options stimulating the supply of organic products

a. Organic research and extension services

Support for organic research and extension is an important policy measure that could facilitate the development of organic agriculture by (1) increasing the productivity and competitiveness of organic farming and (2) providing scientific evidence regarding the benefits of organic agriculture for both policy makers and consumers. At the same time, investing public funds in organic research would not only benefit the organic sector, it would also have a positive impact on the sustainability of the Russian agriculture sector as a whole.

In Russia, where organic agriculture is in its initial stage of development, ***organic farmers*** would be the main beneficiaries of organic research and extension because they would be able to get direct access to innovations that could help them solve existing agronomic and technical challenges, resulting

in lower unit costs of organic products and higher farm incomes. ***Consumers*** would benefit from having more evidence available for the health benefits of organic products as well as from lower prices for these products, which could influence their buying behavior and as a result increase the demand for organic foods. ***Policy makers*** would be able to design more effective policies to support organic agriculture if they are provided with solid evidence about the benefits of this production system. Science-backed evidence would also help ***associations*** in promoting organic agriculture, resulting in a stronger organic movement in Russia.

Supporting organic research would not necessarily require an increase in public spending—it could instead require a shift of priorities to include organic research in the already-existing agriculture research programs. In Russia, organic research may be conducted at specialized agrarian universities (such as the Russian State Agrarian University – Moscow Timiryazev Agricultural Academy) where a specialized organic research program should be established.

In addition to research, setting up a structure that would collect and disseminate research outcomes and knowledge is critical for the development of organic agriculture, which means that research and extension are closely linked. Quantitative research shows that "the availability of organic advice by publicly funded extension personnel was one of the factors with the largest influence on organic farming adoption at the early stage of the sector development" (IFOAM 2017b). Associations could play an important role in disseminating knowledge about organic agriculture at the initial stage, but organic agricultural extension services could also be offered at the level of the Ministry of Agriculture of the Russian Federation or at the regional level. For example, organic extension services could be offered through the Agro-Industrial Consulting Center at the Agro-Industrial Department of the Belgoroskaya oblast administration (http://ikc.belapk.ru/) and similar regional centers that already provide extension services to farmers.

b. Incentives for organic producers and processors

✓ ***Tax breaks for organic producers***

Introducing tax breaks for organic producers is a good way to attract private investment (both domestic and foreign) in the sector. Currently in Russia, 95 percent of investment in organic agriculture is private (Mironenko 2016), and tax breaks could encourage the additional investments necessary to expand the sector. Tax breaks could also help existing organic producers broaden their business because they would have additional resources to reinvest in operations. Tax breaks could be especially relevant during the three-year conversion period, when farmers have already switched to organic production, experience a lower yield, but cannot yet sell their products as certified organic.

For the ***government***, the advantage of tax incentives is that no expenditure needs to be allotted. If the budget to support organic agriculture is limited, tax breaks can be an efficient policy option that is easy to implement. Both ***existing*** and ***transitioning organic producers*** would benefit from this policy measure.

Implementing this policy measure would require coordination between the Ministry of Agriculture and the Ministry of Finance, because offering tax breaks would reduce the overall tax revenues for the government.

✓ ***Support for organic farming during the conversion period***

Public support for organic farming could play an important role—especially in the conversion process—as a measure to encourage farmers to transition to

organic farming. During the transition period from conventional to organic farming, additional costs for aspects such as investing in new machinery, adjusting livestock facilities, and so on are incurred. In addition, during the conversion period farmers bear the additional costs of organic production, but they do not get the benefit of the premium prices for their products.

Various policy instruments could be used in this context—including subsidies, grants, and loans with reduced interest rates. These incentives could be offered within the framework of a general agriculture development program, where organic farming is identified as a priority area. Although ***the government*** would have to allocate budget funds for subsidies, these financial incentives could become a significant driver for the development of organic farming. The Ministry of Agriculture could include organic agriculture as one of the priority sectors in the existing agriculture development support program; in this case existing funds could be used and it would not be necessary to allocate additional resources.

The number of organic farmers is going to increase, which should also increase the supply and reduce the unit cost of organic products. As a result, ***consumers*** would benefit, because increased supply would lead to lower prices and organic products would become more affordable.

✓ ***Support for organic processors***

Support for organic processors is a relevant measure for Russia, where only 11 percent of the companies operating in the domestic market are involved with processing. Facilitating domestic processing increases the value added of organic products and pursues a dual objective: on the one hand, it makes the country less dependent on imports of processed food items; on the other hand, exporting processed products is more profitable than exporting raw materials.

Financial support for organic processors could be in the form of investment support for processing facilities, including supporting the development of cooperatives. This support does not have to be specifically targeted exclusively for organic processors, although they may get higher priority, easier access, or higher grants than processors of nonorganic products. In the same way, as discussed above, ***the government*** would not necessarily have to allocate additional funds for this kind of support; organic processors could be included in an existing agriculture development support program.

3. Policy options stimulating demand of organic products

a. Consumer education and public awareness

Developing consumer awareness about organic food, its benefits, and how it differs from other "healthy" food is an efficient measure aimed at increasing demand for organic products and influencing purchasing choices. Launching consumer education campaigns with an emphasis on a national logo (still to be introduced once the law on organic agriculture is passed) is one of the possible ways to increase awareness.

Locally this can be done through:

✓ *Associations* that play an important role disseminating information about organic products and organic agriculture. Workshops, conferences, infographics, and other materials on organic agriculture are effective ways to provide consumers with information about the benefits of organic products and explain the reasons why organic choices are good ones.

✓ *Retailers of certified organic products,* which could become the platform for distributing ma-

terials created by associations. It is very important to have easy-to-understand materials and visuals explaining the differences between organic and other types of food.

In order to launch national ***public education*** campaigns about organic agriculture, government funding is needed. However, at the initial stage, the government could include information about organic agriculture and organic products in other public awareness campaigns that already exist, such as those promoting a healthy lifestyle and various environmental programs. School and preschool education programs could include gardening based on organic agriculture principles. For cities, community gardens and urban farming projects could focus on promoting organic agriculture.

In Russia, the government plays an important role in forming public opinion and raising awareness about relevant issues. Organic agriculture could become one of the topics to be promoted, especially in the context of promoting a healthy lifestyle and drawing attention to environmental issues.

b. National/common logo for organic products

A national logo makes organic products easier to identify by consumers. It is an efficient promotion and marketing tool and an important factor in building consumer trust of organic products. In addition, creating and introducing a national logo could help avoid fraud. This is especially relevant for those ***consumers*** who buy organic products because they have allergies or other dietary restrictions.

Introducing a national logo would have a positive impact on ***producers and retailers*** because it is likely to increase sales of organic products. If the government is responsible for creating the logo, there would be a greater likelihood of it gaining widespread recognition because this logo would be promoted on the federal level, and in this case the outreach would be more significant.

Assignment

1. Analyze the proposed policy options and discuss their impact (a) on the development of organic agriculture in Russia and (b) on separate groups of stakeholders. How will these policy options impact conventional organic agriculture?

2. What set of policy options should Russia implement if the country was to focus on (a) developing the domestic organic market and (b) developing exports of organic products?

Recommendations

Designing a comprehensive framework of policy measures in the form of a national program, strategy, or action plan is recommended in the longer term. Additional information will be needed to determine whether Russia should focus the development of its organic sector on domestic consumption or on export.

Although Russia has the potential to increase domestic organic production (the amount of certified organic land is comparable to that of the world's leading organic producers), there is limited evidence to support policy recommendations aimed at increasing self-sufficiency and import substitution in the organic sector. Limited demand and low consumption of organic products (both imported and domestic) are the key domestic market constraints. At the same time, stakeholder interviews conducted with industry associations, producers, and certifying companies offer a variety of opinions on what the focus of Russia's organic sector should be. Some stakeholders believe that there is more potential in export (primarily of organic raw materials); others be-

lieve that the domestic market will continue to grow, and once the law on organic agriculture is passed and this space becomes better regulated and “the rules of the game” are more transparent, more companies will start producing organic food.

To design a national strategy for the organic sector development in Russia, additional research and analysis of the domestic market potential, existing production capacity, export potential, and the organic sector value chain is needed.

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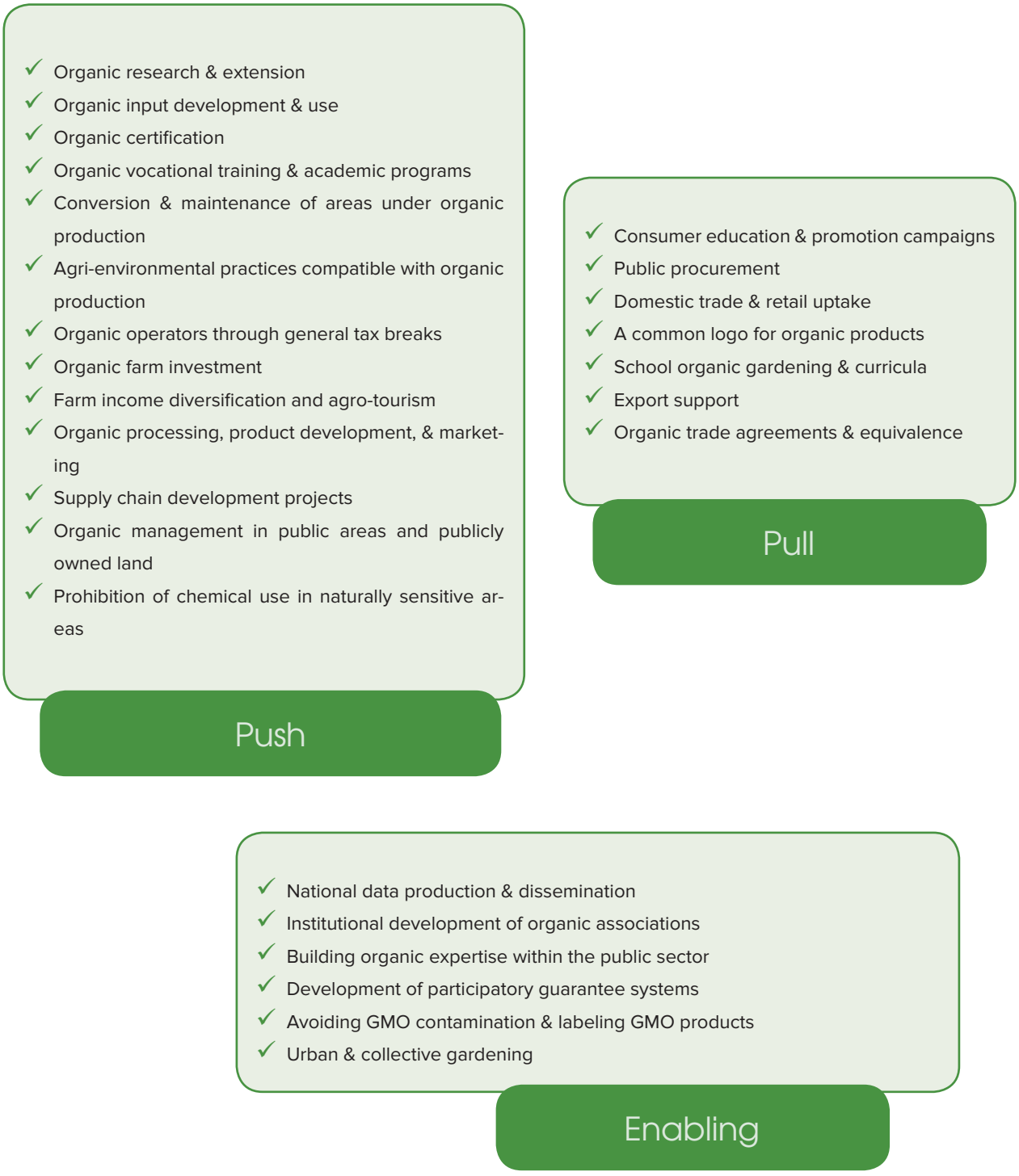
Annex 1

Policy Measures to Support Organic Agriculture



Source: IFOAM 2017b.

Note: GMO = genetically modified organism.

Food System Shocks: An Analysis of Impacts on the Well-Being of the Kyrgyz Population

Ekaterina Yakubovich, Dilbara Kirbasheva

Executive Summary

Food security is a major aspect of the social and economic development of the Kyrgyz Republic. Agriculture is a backbone sector of the economy in addressing food security issues as a provider of basic food products and a source of employment for the population. However, because this sector grows more slowly than others, agricultural production is characterized by moderate growth, and the production of some products (wheat, sugar) has even been decreasing. Imports of food products are an important factor of food security in the Kyrgyz Republic because there is insufficient domestic production of basic food products, leading to the country's dependence on volatile food prices in external markets. Furthermore, food prices also depend on fluctuations in prices of main production inputs (fuel and fertilizers), which are also imported.

In the past decade the world has faced new challenges in achieving food security. The global food crisis and a sharp increase in fuel prices in 2007 followed by a financial crisis in 2008 increased the number of food insecure people worldwide. The 2010 and 2012 droughts affected the global output of grain crops and had an impact on market prices in many parts of the world, especially in Central Asia. The recent economic instability in the world has caused fluctuations in the domestic currency exchange rate because the US dollar and Russian ruble exchange rates exert their influence on the Kyrgyz economy, impairing the purchasing power of poor families dependent on the market (WFP 2014). The food system of the Kyrgyz Republic has also been adversely affected by these shocks, resulting in higher food prices and lower domestic production due to the increase in prices for production inputs (electricity, fuel, and lubricants) and drastic reduction in credits from Kazakhstan and outflow of capital. Together these have led to slower poverty reduction rates in the period since 2010.

This case study seeks **to develop and justify policy options to prevent and reduce the negative impacts of food shocks**. The study identified the following groups of **stakeholders**: government, the population, and agricultural producers.

The analysis identified **main shocks in the food system**, including natural disasters, increased food and input prices in the domestic and external markets, political shocks, and exchange rate shocks. Natural disasters and increased prices for imported products have the strongest impact on the food situation.

In view of the aforesaid, several **policy options** are proposed. Some of them include **response measures**—such as agricultural insurance and a fund to assist socially vulnerable populations—to the shocks that have occurred. Other policy options are meant **to improve productivity and efficiency of agriculture** and, therefore, **mitigate the impact of such shocks on the food system in the Kyrgyz Republic**.

Background

The Kyrgyz Republic is an industrial and agricultural country. Agriculture is one of the most important and priority sectors of its economy because it provides both availability and access to food. The share of the Kyrgyz population living in rural areas is 65 percent; about half of the economically active population is engaged in agriculture (National Statistical Committee 2016).

Food security in the Kyrgyz Republic is an integral component of the national and economic security of the country as a whole because issues of food security are closely related to the overall process of social and economic development (Government of the Kyrgyz Republic 2015).

Food security is understood to be the physical availability of food in sufficient quantities, access to this food by households (this includes food produced by households as well as food purchased in the mar-

ket, food received as in-kind gifts, and food obtained through other sources), and the consumption of food in quantities required to meet nutritional needs (National Statistical Committee 2017).

The analysis of food availability in the country builds on a set of components: domestic production (linked to natural resource assessments), food stocks, exports and imports of food, and food aid.

The analysis of land resources in the Kyrgyz Republic has demonstrated that the country belongs to the group of the countries where there is little arable land per person (about 0.2 hectares), while the overall area of arable land has been declining. As a result, arable land per person continues to decrease. Land degradation and reduced soil fertility is another urgent issue.

The year 2010 saw a substantial reduction in the cultivated area compared to 2009 because of climatic (heavy rains, mudflow) and political factors (civil unrest). However, since 2011 the cultivated area has been increasing on average by 1 percent per year. In 2010–15 the average cultivated area was around 1.1 million hectares; a substantial part of this land (49 percent) was planted with cereals as well as fodder crops (on average around 27 percent), potatoes (7 percent), vegetable oil crops (4 percent), and vegetables (4 percent). Wheat is the main cereal in the cropping pattern; however, in recent years the area planted with cereals has dropped because land has been diverted from wheat to more profitable fodder crops and land used for the development of animal husbandry.

The Kyrgyz Republic has substantial water resources, which is beneficial for agriculture development. The key risk associated with water resource use is lower water management efficiency that results from the deterioration of the irrigation systems and their corresponding inability to meet the demands of agriculture. Development of irrigation systems is a priority task for agriculture development in the country because it will help improve irrigation in available land and make available new irrigated land for growing crops.

To assess the food security level, nine basic food products are used: bread and bakery products, potatoes, fruits and berries, vegetables and cucurbits crops, sugar, vegetable oil, meat and meat products, milk and milk products, and eggs.[1]

Analysis of domestic production in the Kyrgyz Republic (Figure 1) has demonstrated the steady production of the following food products in 2000–2015: potatoes, vegetables, fruits and berries, milk and dairy products, and meat. Production of these food products is characterized by a moderate upward trend. Production of wheat, sugar beet, and vegetable oil crops is characterized by a downward tendency.

The most stable yield has been achieved in the production of vegetable oil crops, potatoes, vegetables, cucurbits crops, and fruits and berries. Wheat yield and sugar beet yield fluctuate substantially. The productivity of livestock demonstrates a negative trend caused by a shortage of fodder and veterinary aid as well as by the degradation of livestock herds.

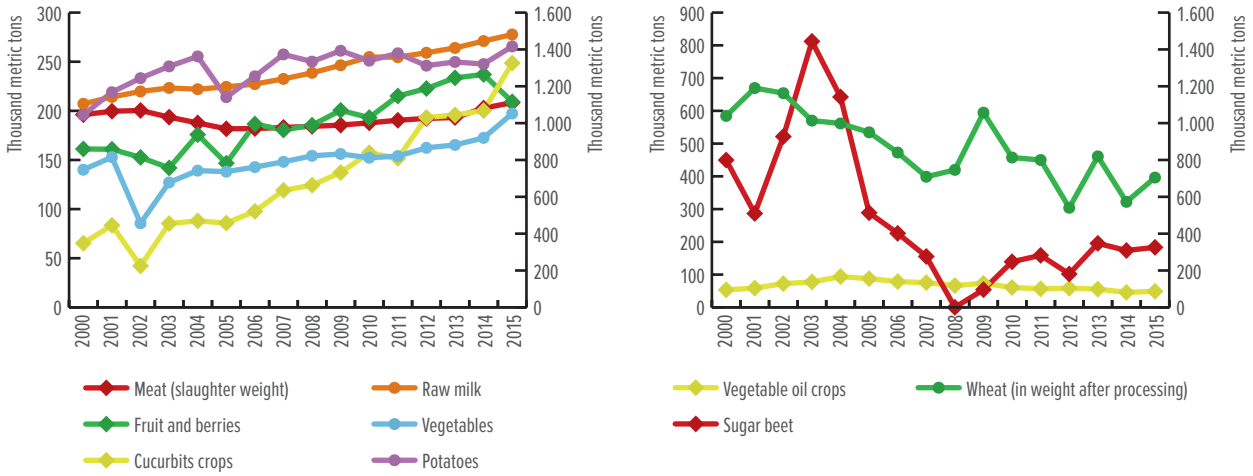
For these reasons, the production of basic food products in the Kyrgyz Republic included in the food security analysis does not demonstrate growth trends, even though production of some food products has been decreasing. A subsistence economy and a low level of machinery and equipment use prevail in the country. Smallholder farms produce more than 90 percent of agricultural products, and the small size of these farms is a constraint on productivity, consolidation, and expanding possibilities of processing and marketing of products (WFP 2016).

[1] This assessment is according to the Resolution of the Kyrgyz Republic Government No. 138, dated March 9, 2009, "On Approving the Regulation on Monitoring and Indicators of Food Security of the Kyrgyz Republic."

Figure 1: Production of Basic Agricultural Products, 2000–15

1a: Production of Meat, Milk, Fruit, Cucurbits Crops and Vegetables

1b: Production of Vegetable Oil Crops, Wheat and Sugar Beet



Source: National Statistical Committee, Agriculture of the Kyrgyz Republic, various years. http://www.stat.kg/ru/publications/sbornik-selskoe-hozyajstvo-kyrgyzskoj-respubliki/

In recent years the contribution of agriculture to the country's gross domestic product (GDP) has been declining (agriculture contributed 28.7 percent in 2006 but only 14.1 percent in 2015), reflecting the slow rates of the sector's development compared with other sectors.

In 2014, the Kyrgyz Republic was fully self-sufficient in three out of nine food security products that are staple foods for the country, namely, potatoes (by 149 percent), vegetables and fruits (by 140.6 percent), and milk and dairy products (by 110.6 percent). The country's inability to make food products available to the population through domestic production increases food imports.

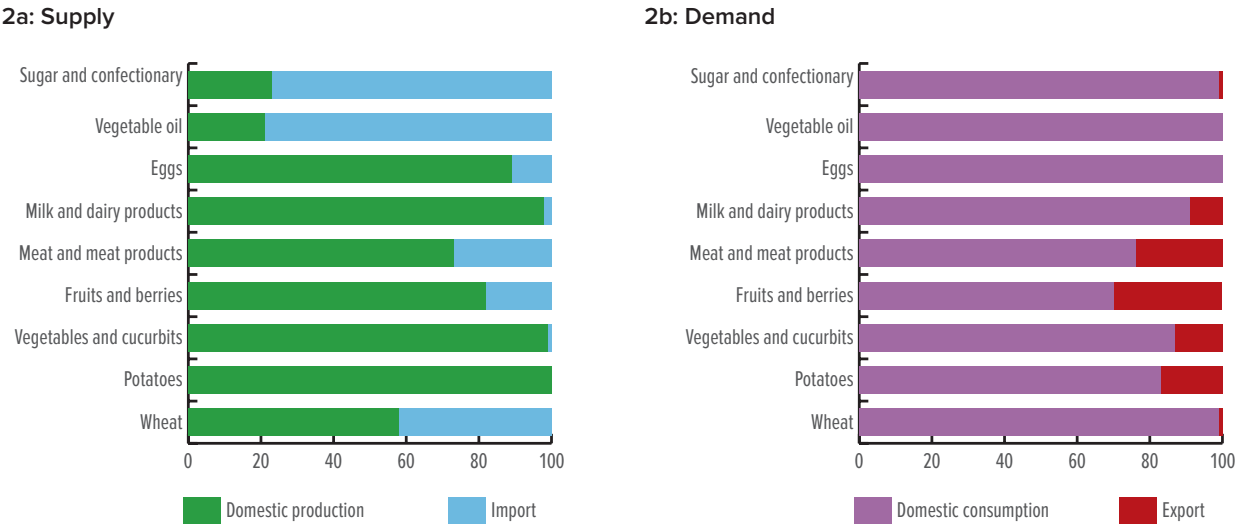
The dynamics of importing and exporting basic food products are not steady. They depend on demand for these products in external and domestic markets; this demand is determined by many factors, including prices, domestic production, production in food-exporting countries, introduction of customs duties, and so on. The country imports large quantities of wheat, vegetable oil, and sugar for domestic consumption (Figure 2); imports of almost all food products have been increasing, while exports of dairy products and vegetables have been going down. On the whole, such dynamics demonstrate a higher reliance of the Kyrgyz Republic on food imports because domestic production has exhibited only moderate growth and, in some cases, has even declined.

An analysis of factors impacting the affordability of food for the population has shown that the most relevant factors include inflation rate, food prices, the social safety net for vulnerable groups of population, and the total income of households (Government of the Kyrgyz Republic 2015).

A low level of agricultural production and low self-sufficiency in food, along with market's dependence on food imports—especially grain and flour imports—make domestic prices sensitive to fluctuations of global prices.

The share of food expenditures in the subsistence wage varies from 63 percent to 71 percent regionally, with food expenditures of the lowest income

Figure 2: Average Supply and Demand for Basic Food Products, 2010–15 average



Source: National Statistical Committee. Various years. Information Bulletin of the Kyrgyz Republic on Food Security and Poverty.

quintile (20 percent of the population with the lowest income) being around 60 percent of average per capita income, while food expenditures of the top quintile (20 percent of the population with the highest income) are the lowest and constitute around 30 percent. This means that population with the lowest income is hit hardest by an increase in prices.

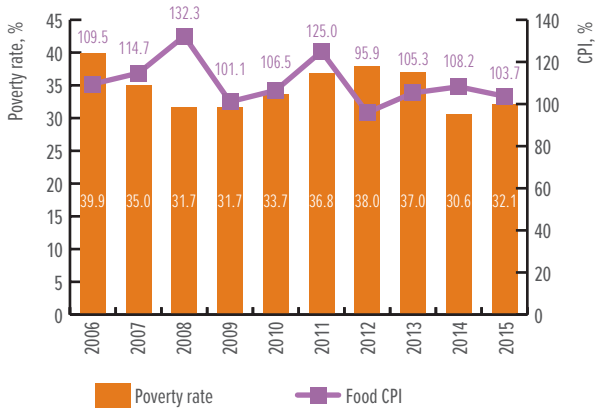
Analysis of food product consumption by the population shows that over the past 10 years the diet has been monotonous. Bread and bread products take up around one-third of the dietary intake of the Kyrgyz population. Potato and sugar consumption is also high. The insufficient consumption of meat, vegetables and fruits, and milk and dairy products is the result of the population not being able to afford an adequate, nutritious diet. In recent years, on average the poorest people (the first quintile) have consumed around 1,800 calories per person per day, which is around 85 percent of the calories required by the scientifically substantiated and legislatively approved nutrient and energy standards in the Kyrgyz Republic. Consumption of proteins and carbohydrates below the requirement has also been observed. Undernutrition slows down economic growth and aggravates poverty through direct losses in the productivity of the current population. For this reason, the poorest population is more susceptible to food shocks, more reliant on social benefits and less dependent on income to get access to adequate quantities of food. Poor households in the Kyrgyz Republic receive a monthly benefit that is paid to low-income families with children. This was 128 Kyrgyz soms per recipient in 2008, and was increased to 873 Kyrgyz soms per capita in 2016.

After becoming independent from the Soviet Union in 1991, the Kyrgyz economy was picking up steam and the poverty rate dropped (from 64 percent in 2003 to 31.7 percent in 2008), infant mortality decreased, and average life expectancy increased. However, economic, political, and climatic factors reversed the positive trend of poverty reduction, and in 2009 poverty began steadily increasing, peaking at 38 percent in 2012 (Figure 3).

Analysis of Shocks Arising in the Food System

In this case study, *food shocks* means abrupt substantial fluctuations in prices, production, consumption, and the export and import of basic food prod-

Figure 3: Dynamics of the Poverty Rate and the Food CPI, 2006–15



Source: National Statistical Committee. Various years. Poverty rate data from 1, Living standard. Dynamic table on poverty rate, http://www.stat.kg/en/statistics/uroven-zhizni-naseleniya/ Food CPI data from 2, Prices and tariffs. Dynamic table on Consumer price index by types of goods and service (ICCP) http://www.stat.kg/en/statistics/ceny-i-tarify/

Note: CPI = consumer price index.

ucts, affecting the well-being of the country's population.

The authors' interviews with the experts identified key reasons for shocks in the food system:

- ✓ A decline in agricultural production and its extensive nature
- ✓ The deteriorated agriculture infrastructure, and disrupted inter-farm economic links
- ✓ Increased area of degraded agricultural lands (including arable lands and pastures)
- ✓ Inefficient use of water resources
- ✓ A decline in seed production and animal husbandry
- ✓ A difficult phytosanitary and anti-epizootic situation
- ✓ Disrupted crop rotation
- ✓ Technical and technological lagging behind of agro-business
- ✓ Reduced productivity of the crop farming and animal husbandry sectors

The analysis of the Kyrgyz Republic's food system identified the following main types of shocks:

Natural Shocks (Mudflow, Droughts, Floods)

Agricultural production in the country is very susceptible to the impact of natural disasters and climatic conditions. In recent decades the Kyrgyz Republic has faced an increase in the number of natural disasters caused by changes in the climate, such as higher temperatures and lower precipitation rate. Most likely these will increase the frequency and severity of floods and droughts. Given the geography and topography of the country, damage from disasters caused by climate change is estimated by specialists to vary between 1 and 1.5 percent of the country's GDP (GFDRR 2011).

Heavy rains make it difficult to access fields, delay the sowing period, and also cause mudflows and floods that damage crops and irrigation systems. The consumer price index was 19.2 percent higher in December 2010 than it had been the previous year. Unfavorable conditions in the Kyrgyz Republic and in grain-producing countries, which triggered a ban of grain exports in Russia and a ban of sunflower oil and cereal exports in Kazakhstan, is one of the reasons for higher prices. For example, heavy rains in 2010 resulted in a delay in sowing by two to three weeks, but good precipitation during the subsequent months offset potential negative effects on yields of the late start of planting. For this reason, no substantial reduction in production was observed.

Drought in the Kyrgyz Republic also affects the production of agricultural output. Furthermore, droughts in those countries that are main suppliers of food to the Kyrgyz Republic, such as Russia and Kazakhstan, also impact food security in the country. The 2012 and 2014 droughts had a negative impact on grain crop production in many countries of the world. In the period between 2010 and 2015, domestic production of wheat in the Kyrgyz Republic dropped by more than 20 percent, resulting in higher imports of wheat and higher prices for flour.

Rising Food and Input Prices in the Domestic and External Markets

Food imports make food prices sensitive to price fluctuations in global markets—especially wheat prices, which are particularly important because wheat is a staple food in the Kyrgyz Republic. The production of agricultural products requires inputs (such as fuel and lubricants, and fertilizers); most inputs are imported, and therefore input price fluctuations also impact food prices. A global economic crisis and a sharp increase in fuel prices in 2007 followed by a financial crisis in 2008 pushed up food prices by 32.3 percent compared with 2007, when the inflation of food prices was also high (14.7 percent). Given the heavy reliance of domestic consumption on imports, the 2008 global food crisis adversely affected the output of agricultural producers and the urban population, hindering further poverty reduction. In 2012 the poverty rate went up to 38 percent before declining to 32.1 percent in 2015. Some of the factors that impacted food prices in 2010 were the growing prices for fuel and lubricants due to export customs duties, introduced on April 1, 2010, for oil and refined products exported from Russia to the Kyrgyz Republic, as well as an increase in global prices.

Political Shocks

Political shocks mean border closures and the introduction of export duties and other factors that cause a reduction of the production, export, and import of food.

In 2010 the borders with Kazakhstan and Uzbekistan were closed because of the civil conflict; the closure of the border increased costs of agricultural inputs and disrupted the supply of fertilizer, fuel, and machinery as well as labor migration from Uzbekistan to the southern the Kyrgyz Republic (FAO and WFP 2010). The closure of the borders with neighboring countries practically blocked the export of agricultural products. Membership in the Customs Union also led to a tightening of the checkpoint regime on the borders. The civil conflict lowered investment activity, and capital outflow amounted to US$118 million in 2010,[2] which was almost half the incoming foreign direct investment.

To protect their domestic markets, Russia and Kazakhstan introduce export duties for wheat from time to time. This also has an impact on food prices in the Kyrgyz Republic.

Exchange Rate Shocks

The country pursues the policy of the floating exchange rate, which means that the exchange rate of foreign currencies—in particular, the US dollar–to–som exchange rate—is set based on demand and supply in the domestic foreign exchange market. At the same time, it does not mean that the central bank does absolutely nothing in this regard. In conformity with monetary policy, during the periods of sharp fluctuations of exchange rates, the National Bank of the Kyrgyz Republic mitigates such fluctuations by undertaking interventions in the foreign

[2] Информация об итогах социально-экономического развития Кыргызской Республики за 2010, Приложение к постановлению Правительства Кыргызской Республики от 19 января 2011 года N° 14 (in Russian).

exchange market and regulating liquidity of foreign exchange market participants. To smooth out sharp fluctuations of foreign currency exchange rates, the National Bank has foreign currency reserves, including gold that accounts for 10 percent of the reserves.

The economy of the country is very susceptible to fluctuations in the som-to-dollar exchange rate and the som-to-ruble exchange rate. The remittances of labor migrants are an important source of household income, enabling the population to purchase food staples and manufactured goods (WFP 2016); any slowdown of economic growth in Russia and ruble depreciation will deteriorate the purchasing power of the population in the Kyrgyz Republic.

Exchange rate shocks also impact the export of agricultural products. For example, in 2015 the som depreciated in value, and the National Bank of the Kyrgyz Republic stepped in to stop currency depreciation. However, its efforts undermined the exports of the country because domestic products became more expensive in the external market and exports fell by 21 percent compared to 2014.

Stakeholder Groups and Their Responses to Food System Shocks

To study the key stakeholders' response to shocks in the food system, we employed a survey method. This is an analytical research tool that relies on experts' opinions to collect data on events covered by this case study. The survey was based on a questionnaire developed specifically for this exercise. The respondents were specialists from the Ministry of Economic Development of the Kyrgyz Republic and from the Ministry of Agriculture of the Kyrgyz Republic, and agricultural producers (heads of peasant farms and members of the Union of Cooperatives of Kyrgyzstan). The respondents were asked questions such as: What types of shocks in the food system would you identify? What are the main causes of such shocks? What measures did the government undertake? What was the response of agricultural producers? What was the situation food consumers found themselves in?

Most experts interviewed believed that the main causes of food shocks were the country's specific natural conditions and its dependence on food imports.

The next section elaborates on the causes and motivation of the actions taken by stakeholders (government agencies, the population, and agricultural producers) as well as their responses to the shocks arising in the food system in the Kyrgyz Republic.

Government

The Government of the Kyrgyz Republic and its agencies are key stakeholders in improving the food system and the well-being of the country's population. Poverty reduction, increased incomes, and better access to high-quality and safe food in sufficient quantities in line with recommended nutritional consumption norms will help substantially reduce state budget expenditures spent on treatment of diseases caused by undernutrition. ***In addition, the government acts as a coordinator of various stakeholders.***

Although the food system in the Kyrgyz Republic has a high resource capacity, it is characterized by relatively low efficiency and low competitiveness.

Key government policies seeking to reduce shock impacts on the food system in the Kyrgyz Republic were primarily aimed at ensuring an adequate level of food production to meet the growing demand of consumers. Another and no less important task was to guarantee access for each citizen to food products in quantities sufficient for a healthy and active life.

In response to highly inflated food prices in 2008 and 2009, the Government of the Kyrgyz Republic adopted Law No. 183 of August 4, 2008, "On Food Security in the Kyrgyz Republic," which set forth key policies to ensure food security in the country based on minimum standards of food consumption. These policies include the purchase of wheat from domestic producers and distribution of wheat flour among vulnerable populations; the strategic stockpiling of food; subsidized credits to farmers; the introduction of seasonal export duties for wheat and wheat flour; and support measures to acquire agricultural machinery and modernize the seed sector.

The government, represented by the National Agency of Antitrust Regulation, cannot regulate food prices because there are no monopolists among agricultural producers, and because prices are primarily set by markets. In 2009 the Government of the Kyrgyz Republic adopted Resolution No. 242, "On Price Regulation for Selected Socially Important Goods." This resolution aimed to contain the increase in prices for socially important goods (flour, bread, milk, vegetable oil, butter, meat, sugar, rice, pasta, eggs, potatoes, coal, Ai-80 and Ai-92 grades of gasoline, diesel fuel, and liquefied gas) and to ensure economic availability and affordability of food products for socially vulnerable populations. According to this resolution, implementing agencies are responsible for monitoring prices, arranging fairs to enable producers and suppliers to sell socially important basic goods, creating proper conditions for conducting fairs, and carrying out public awareness and outreach activities to inform general population and entrepreneurs about efforts to contain the increase in prices for socially important basic goods.

In addition, the Government of the Kyrgyz Republic used other measures—the so-called market management policies, for example, which are price controls by administrative orders. Because most production is concentrated in the private sector, the government, essentially, cannot influence prices. However, if prices for socially important goods increase by 20 percent or more in several months, the government has the right to introduce state regulation and freeze prices. Nevertheless, as experience shows, the effect of such measures is rather short term. At the same time, these government measures intended to regulate prices had a destabilizing effect on the food system, because companies often responded to such measures by hoarding stocks, which pushed prices up even higher: the effect in this case is the opposite of what is expected or intended.

Tax reduction for producers, especially grain producers, was widely used as a policy measure aimed at boosting production. Production subsidies, primarily for grain production, were provided to strengthen incentives.

It may be concluded that in the periods of various shocks in the food system in the Kyrgyz Republic, the government responded to high food prices by adopting a variety of policies. However, prompt actions to ensure food supply to domestic markets and reduce costs of domestic consumers had only a limited effect. At the same time, it is important not to forget the medium- and long-term need to increase food production and the international implications of a one-sided choice of national policies. As a consequence, the emerging trend of dependence on imports continues to push up prices while the social safety net is lagging behind and the government is unable to stay ahead of the issues and addresses them as they arise. Therefore, despite the measures taken to improve the food system, it remains very susceptible to the impact of various adverse shocks. In the future, such shocks in the food system may lead to an acute crisis and the poor would be the first to suffer from it.

The experts believe that the existing food security management system in the Kyrgyz Republic is inefficient, first because of a lack of attention to food system development at the policy level. Tools for rapid response to inflation and food shocks are weak, and there are large social groups that are at risk of lacking access to food. However, the country's leader-

ship is aware that solution of these issues requires the development of a smoothly running and flexible system of governmental regulation that includes ensuring the production, affordability, quality, and safety of food products (IDK-Эксперт 2014).

The Population

A key segment of the stakeholder group is the population of the Kyrgyz Republic, which should have access to adequate and sufficient food in line with recommended nutritional consumption norms. A large percentage of population is the poor. They usually spend the largest part of their meager budget on food because of reduction of income accompanied by inflationary food price increases. Higher retail and wholesale food prices reduce consumption of expensive protein products and lower access to food for a large part of the country's population. This leads to higher morbidity caused by undernutrition or low diet diversity.

High and volatile prices for food products are among the main threats to food security for poor and vulnerable households because they put additional economic pressure on people who are already spending large portions of their incomes on food. Domestic prices for main products (such as wheat flour, sugar, and vegetable oil) are sensitive to global prices for food because of the strong dependence of the country on imports.

Consumer purchasing power depends on food prices and rural household income from, predominantly, subsistence farming, wages, and social transfers. These factors, in turn, determine consumer access to food. Subsistence farming rather than paid work is the most common type of activity for rural households, although, in addition to agricultural income, other sources of income are non-farm wages and salaries.

Shocks in the food system of the Kyrgyz Republic have led to a more active level of agricultural production in household plots. But the marketability of products from household plots tends to be low, while increased output of agricultural products in this segment in the most severe crisis years means that survival issues became very urgent for households that tried to address them by producing food in their plots and *dacha* gardens,[3] mostly for individual consumption.

The economic and social development of the Kyrgyz Republic is hampered by a slowdown of economic growth rates and a specific social structure characterized by predominance of peasantry and "in-between" urban groups. The country is suffering from a very high unemployment rate (8 percent).

Agricultural Producers

As of January 1, 2016, there were 505,100 agricultural companies; around 54 percent of such companies (271,100) are peasant smallholder farms. The largest share of agricultural products (58.6 percent) is produced by these farms. The remaining output is produced on household plots (37.5 percent), while state and collective farms account for 2.2 percent of output.

On average, a smallholder farmer owns from 2.3 hectares (in the Batken region) to 12.4 hectares (in the Naryn region) of agricultural land. For this reason, smallholder farms cannot implement efficient technologies of tillage or introduce crop rotation and build processing facilities.

Peasant smallholder farms have also been severely affected by sharp swings in food prices in agricultural commodity markets. Moreover, they have had to compete with import product suppliers in the domestic market.

[3] A *dacha* is a summer cottage or country house in Russia or other parts of the former Soviet Union.

High levels of prices, production risks, and uncertainty as well as limited access to risk management tools have prevented farmers from investing funds into more productive new technologies that would allow them to produce commercial surplus for sale in the market. For example, the political shocks of 2010 reduced investment flows from Kazakhstan and Russia, and credit resources became less affordable. A lack of adequate infrastructure, high storage and transportation costs, and high competition in the market were not conducive to product surplus either. Because of all these constraints, most smallholder farmers are unable to integrate into organized markets and take advantage of trade opportunities when the situation changes. Generally speaking, farmers can increase their presence in the markets if certain conditions prevail—for example, stable prices, affordable credits, efficient infrastructure, and rural advisory services that enable them to sell their products, which will be absorbed by the market at optimal costs. However, remote locations and inadequate production resources make integration into modern marketing channels too expensive and limit quantities of surplus product that smallholder farmers can or are ready to sell.

Other factors have also led to instability of production by peasant farms. These include the limited access of agricultural producers to goods and services that determine the level of production, such as credits, agricultural machinery, protection of plants and animals, high-quality seeds, and highly productive pedigree animals and quality pedigree stock, as well as a shortage of good-quality and nutritious fodder and other problems of market sales related to a poor system of product certification and inadequate marketing support. There is also a lack of steady economic links between agricultural producers and processing companies that would support beneficial and long-term cooperation; a lack of necessary incentives for producing nutritious food (enriched flour and food made out of it, iodized salt, nutrient additives). And there are big issues in the system of agricultural production management related to the inefficient performance of regulation and distribution functions as well as issues associated with the provision of adequate incentives to enhance efficiency of production.

Political shocks pushed up input prices and disrupted supplies of inputs (temporary closure of the borders with Uzbekistan resulted in a shortage of labor during seasonal work, while closure of the borders with Kazakhstan disrupted the supply of fertilizer, fuel, and machinery) and also reduced investment attractiveness of the country to its neighbors. Because of low technological development, agricultural production was very susceptible to natural shocks, which also caused heavy losses.

Despite state support measures, access of rural agricultural producers to financial resources continues to be a big problem. The issue of credit collateral limits access to bank credit. So far, small landholdings cannot be used as collateral because the land market in the Kyrgyz Republic is not yet operational.

Foreign trade volumes impact many economic and social variables, which, ultimately, determine the status of food security and nutrition of the population, including growth, income, poverty rate, inequality, food prices, and state budget. Because the Kyrgyz Republic has been opening its economy for international trade in agricultural products, it has become more susceptible and potentially vulnerable to unexpected changes in global agricultural markets. For example, a sharp and unexpected increase in imports may become a constraint on agriculture development. Even if such events are temporary, producers are ill-prepared to counter market risks, and a surge in imports may disrupt domestic production and generate potentially destructive consequences for local farmers and agricultural workers because prices for the products of domestic companies may plunge, income may drop, and the effect will spill over to other sectors of economy, potentially affecting food security. For example, low-income farmers

who have used up almost all their resources to survive and who do not have access to the social safety net may be severely affected by such price shocks in the longer term.

Higher dependence on international markets has made the Kyrgyz Republic more vulnerable to short-term market upheavals. These can be caused by shocks leading to a reduction in stocks and an increase in consumer prices, and shocks caused by import surges and a subsequent reduction in producer prices.

As a result, domestic production in sectors competing with import products was severely hit. A reduction in prices for agricultural products is perceived as an impediment to the development of the agricultural economy, which reduces the attractiveness of investments in technologies aimed at improving productivity; it also has a negative impact on food security. Nonetheless, experience has shown that such periods of lower prices are followed by periods of high and volatile prices and then lower prices come back again. Unexpected surge in prices may pose a serious threat to food security.

Policy Options

To reduce negative consequences of shocks in the food system, early warning methods need to be developed. These are methods that would help avoid negative developments in the food market such as a threat of food shortage, a surge in food prices, and so on. The government should develop a response system, and the ministries and agencies would be required to provide day-to-day information on food prices and prepare accurate short-term projections. It is important that this effort be systemic for the government to be able to take preventive measures.

We used this case study as a basis for developing and justifying a list of policy options to improve the food system in the Kyrgyz Republic and reduce its susceptibility to various shocks.

1. Create a government-supported system of agricultural insurance

Agriculture in the Kyrgyz Republic is rather heavily dependent on natural conditions; that is why it is susceptible to natural risks that cause substantial harvest losses to farmers. The Ministry of Agriculture and Land Improvement of the Kyrgyz Republic estimates that the total damage sustained by farmers in 2010 exceeded 303.8 million Kyrgyz soms; natural disasters (floods, mudflows), especially in the south of the country, occur more and more frequently and damage caused to agriculture increases every year. Basically Kyrgyz farmers did not receive any compensation for the damage.

The law “On Specific Features of Crop Insurance” was adopted in 2009; however, in the absence of a regulatory and legal framework that would govern the establishment and operation of the agricultural insurance fund, there is no state insurance available to farmers in the country today.

Insuring against agricultural production risks could mitigate the impact of natural shocks through the partial or full compensation of crop losses. Another advantage of insurance is that it provides a better financial situation for agricultural producers in terms of their creditworthiness because financial institutions give preference to those agricultural producers who guarantee that they can keep some of their income when natural disasters and crop losses occur.

Creating a state agricultural insurance fund, supported by contributions made by the farmers and payments from the state budget, could address this issue.

To put in place the mechanism of agricultural insurance, it would be necessary to:

- ✓ convince agricultural producers that agricultural insurance has economic benefits;
- ✓ develop insurance rules;
- ✓ ensure that insurance rates are affordable—this means that most agricultural producers should be able to afford to make insurance payments to the insurance fund; and
- ✓ have a transparent, easy-to-understand, and guaranteed system of payments when the insurance case arises.

Another important issue to be considered is whether insurance should be mandatory or voluntary. It is advisable that insurance be voluntary at first, and cover only main crops; in due course mandatory insurance of main crops could be introduced. This approach to setting up the insurance fund would be more efficient.

2. Establish a state fund for providing assistance to vulnerable groups of population in case of food shocks

As data on food expenditures for five quintiles (the first quintile is the poorest population; the fifth quintile is the richest population) provided by the National Statistical Committee demonstrate, the size of the single social benefit to low-income families per person per month is no more than 42 percent of the total food expenditures of the households from the poorest quintile (WFP 2016). The single social benefit supports households with low food security so that their deficit in food consumption is reduced, but it fails to provide a minimum budget for purchasing nutritionally rich food. All this means that benefits paid to poor households are not adequate to ensure food security of household, and when food prices go up, such benefits do not improve the diet, and dietary nutritional characteristics may be worsened by food shocks. That is why, if the state fund that would assist vulnerable groups of population as a response to food shocks were to be established, it could make one-off payments when such shocks arise.

3. Develop cooperation and create conditions for farmers to enter the common agricultural market

Currently, subsistence agriculture is predominant in the Kyrgyz Republic, resulting in extensive increase in production, mostly by expanding areas under cultivation. More than 70 percent of agricultural products are produced by smallholder farms. As a consequence, when prices for food or certain food products increase, one-off measures to increase agricultural output are taken. For example, in order to have successful planting and harvesting, more than 500 million Kyrgyz soms in state support were allocated to agricultural producers in 2009 after the 2007–08 crisis. The support received from the government resulted in increased production of all crop farming products compared with 2008; wheat production increased substantially by 41 percent.

One of the ways of to increase productivity in agriculture is to move away from subsistence farming to commercialization and to create producers of agricultural commodities. Today all land is owned by smallholder farms, each having from two to three hectares; most farmers do not pursue the task of selling their product; they produce for their own consumption and sell only surplus.

It is necessary to consolidate and merge farms to provide more opportunities for agricultural production.

To help small farmers enter the common agricultural market of the country, the government must support the organization of fairs and expand the network of markets where farmers can sell their products.

Furthermore, the government should provide annual budget subsidies to farmers who expand the area planted in wheat and who increase their cultivation

of quality grains and sell such grains, first of all, under public procurement quotas. One of the measures to support these farmers could be a signed contract that would provide advance payments of 50 to 60 percent before sowing begins. Seeds, fuel and lubricants, necessary agricultural machinery, and so on should be provided (sold) to such farmers as a priority group.

Food export is affected by inadequate certification of domestic agricultural products and by processed food that does not meet sector needs. Cooperation among farmers and links between agriculture and the processing industry need support. Today Kyrgyz farmers tend to form, mostly, consumer cooperatives or agricultural product and service cooperatives, as they are called, using a fraction of total cooperation capacity, mostly in the form of the shared use of agricultural machinery and, in some cases, joint procurement of fertilizers and seeds. Storage, processing, marketing, and selling are handled by an actively developing market of intermediaries. Intermediaries appear to harvest crops themselves, load them in big trucks, and take them to export, while farmers do only farming and, as a consequence, receive only a small share of the value of their products. Without claiming to participate in all links of the added-value chain, cooperatives, nevertheless, could win a part of the market to earn more and retain revenues for their members, which is the rural population. Cooperatives are primarily organizations that help economically vulnerable people arrange a joint farm without intermediaries, equitably distributing profits and democratically managing the process. So it is important for cooperatives to become key allies of the government and international partners in achieving social goals of agribusiness and regional development as well as job creation in rural areas.

4. Implement a contracting system in agricultural production

The country needs to address not only the issue of production but also the issue of sales of the output and compliance with certain standards.

Contractual agreement is a type of purchase and sale contract—it is a contract that regulates relationships related to the purchase of agricultural products grown or produced by agricultural companies or peasant smallholder farms.

As a result of signing these contracts, farmers know in advance what they have to produce, in what quantities and of what quality; they could even get some advance payment, which would have a positive impact on agriculture development. Such contracts could be beneficial for the development of the processing industry. For example, Kyrgyz agricultural producers could supply beans, tobacco to the armed forces of the members, which would mean guaranteed supplies under contractual agreements prepared in advance.

5. Encourage specialization under the Eurasian Economic Union

Under the Eurasian Economic Union, certain specialization is inevitable because of geography and available resources. No country, even the largest and most developed, can be highly competitive in all areas. Member countries of the Eurasian Economic Union may specialize in producing food products based on their own specific climatic conditions, existing resources, and potential. Each Eurasian Economic Union country, with the help of other members, should create strong modern clusters and enterprises that would compete with products from third countries, which will increase exports.

As noted earlier, in recent years, the area planted in cereals has been reduced because wheat land has been diverted to more profitable fodder crops. Besides, domestically produced wheat has low gluten, which is another reason for wheat imports. Given all these factors, the government should support specialization under the Eurasian Economic Union and divert some planted areas to those crops and plants that are more suitable to the country's climate, more

competitive in foreign markets, and can increase the volume of the country's exports.

Assignment

The assignment is to identify causes, motivation, and response of the stakeholders to shocks arising in the food system; and to analyze policy options and develop the most optimal system of policy measures that would meet interests of all stakeholders to the maximum extent possible while allowing the country to avoid or substantially reduce the susceptibility of its food system to potential shocks in the future.

Conclusion and Recommendations

The overview of the food system in the Kyrgyz Republic showed that the trend of basic food outputs has not been positive and, in fact, the output of some foods has been declining. Self-sufficiency has been achieved for three staple foods: potatoes, vegetables and fruits, and milk and dairy products. The inability of the country to provide home-grown food to its population leads to imports of necessary food products. The country imports large quantities of wheat, vegetable oils, and sugar for its own consumption; imports of almost all products have been increasing; and the export of dairy products and vegetables has been decreasing.

This analysis of the food system in the Kyrgyz Republic has identified the following main shocks in its food system: natural shocks (mudflows, droughts, floods, etc.), increased food and input prices in the domestic and external markets, political shocks (border closure, customs duties), and exchange rate shocks. The experts believe that the impact of such shocks is stipulated by problems that have accumulated in the country's agriculture—namely, the extensive nature of the agricultural sector development, disrupted inter-farm economic links, land degradation, inefficient water management, and so on.

Causes and motivations of various stakeholders such as the government, population, and agricultural producers, along with their responses to the shocks arising in the food system in the Kyrgyz Republic, were examined.

Policy options for transformations in the country were developed and proposed. Their main objective is to contribute to the development of the food system and reduce its susceptibility to various shocks.

A forecast of changes in the situation that would result from the proposed policy options enables us to recommend those options that are the most productive and efficient in the face of limited budget funds in the Kyrgyz Republic. These recommended options are to create a government-supported system of agricultural insurance; establish a state fund for providing assistance to vulnerable groups of population in case of food shocks; implement a contracting system in agricultural production; and implement a sustainable rural development policy.

It should be noted that all developed policy options are forward-looking. They require a phased approach in implementation and will help achieve a positive effect in the development of the country's food system and reduce its dependence on various shocks arising in the future.

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Strengthening Agricultural Resilience against Droughts in Uzbekistan: From Crisis Management to Drought Risk Mitigation

Aziz Nurbekov, Alisher Mirzabaev

Executive Summary

Over the last two decades, Uzbekistan has faced several occurrences of **extreme hydrological droughts**, with crop yield losses of 50 percent to 75 percent in the worst-affected areas. These droughts also had substantial negative impacts on people's livelihoods and food security. Drought impacts are modulated by vulnerability and resilience to droughts, which are affected by actions taken to mitigate drought risks. **Drought risk mitigation** includes a variety of risk management activities carried out before droughts actually occur. However, often responses to previous droughts emphasized ex post crisis management approaches rather than proactive and more economically efficient drought risk mitigation strategies. If proactive drought risk management is socially optimal compared with reactive crisis management, then the question is: **what are the barriers and opportunities for the transition from crisis management to drought risk management in Uzbekistan?**

This case study seeks to provide responses to this question by reviewing past drought impacts and evaluating policy, institutional, and technological options to strengthen resilience against droughts. The study hypothesized that, for their successful uptake, drought risk management actions should have substantial co-benefits and positive social returns even without droughts. The results showed that improved access to extension, access to credit, and diversified cropping portfolios were strongly linked with farmer drought coping and drought risk mitigation actions.

Stakeholder analyses pointed out that major consensus-based drought risk mitigation policy actions in Uzbekistan were improving water use efficiencies through cleaning and good maintenance of irrigation and drainage networks, developing drought-resistant cultivars, adopting water-saving irrigation technologies, and improving market access for farmers—including access to drought risk insurance. Stakeholder responses indicate widespread understanding and agreement about the necessity of drought risk mitigation activities; however, what seem lacking are stronger inter-agency linkages and coordination, and the national-level strategy framework guiding these drought risk mitigation and preparedness activities.

Background

Uzbekistan is located in arid and semi-arid areas vulnerable to frequent droughts (Gupta et al. 2009). Because of its high aridity, agricultural production is possible only through supplemental irrigation in most of the country (Chub 2007). The major sources of irrigation water are the glacier-fed Amudarya and Syrdarya rivers, which have high inter-annual flow variability (Dukhovny, Sorokin, and Stulina 2008; Sorg et al. 2012). During minor drought years, this variability could be compensated by the vast network of 55 water reservoirs in the country; however, during major and protracted droughts, the current reservoir total capacity of about 20 cubic kilometers is not sufficient. Furthermore, the needs for irrigation water are growing rapidly (Cai, McKinney, and Rosegrant 2003). Increasingly, the imbalance between the availability of water and growing water demands is exacerbating the impacts of even previously mild drought years. As a result, over the last decade, Uzbekistan has faced several occurrences of extreme hydrological droughts, with crop yield losses of 50 percent to 75 percent in the worst-affected areas (FAO 2017). These droughts have also had substantial negative impacts on people's livelihoods and food security. During the drought in 2000–01, it was reported that cereal production declined by 10 percent, cotton production by 17 percent, and rice production by 60 percent, resulting in about US$130 million of losses (World Bank 2006). The biggest losses occurred in the downstream areas in Uzbekistan, where about 600,000 people were in need of food aid to the value of US$19 million (World Bank 2006; FAO 2017). In this context, Mirzabaev and Tsegai (2013) also found that a 30 percent reduction

in irrigation water availability could increase wheat prices by about US$400 per metric ton in the country over the price per metric ton in normal hydrological years.

The extent of drought costs and impacts is modulated by vulnerability and resilience to droughts, which are affected by actions to mitigate drought risks. Drought risk mitigation includes a variety of risk management activities carried out before droughts. However, a usual course of action in Uzbekistan in the past had been responding to droughts through costlier ex post crisis management, rather than proactive and economically more efficient drought risk mitigation, which is currently being increasingly promoted. In this regard, climate change is expected to increase the frequency and severity of droughts in Uzbekistan (Sorg et al. 2012), making crisis management approaches even less affordable. If proactive drought risk management is socially optimal compared with reactive crisis management, then the question is: what are the barriers and opportunities for the transition from crisis management to drought risk management in Uzbekistan?

This case study seeks to provide responses to this question by reviewing past drought impacts and evaluating policy, institutional, and technological response options against droughts. We hypothesize that, for their successful uptake, drought risk management actions and investments should have substantial co-benefits and have positive social returns even without droughts. Hence they can be widely promoted as low- or no-regret policy strategies for sustainable development and building resilience to a variety of environmental, economic, and social shocks.

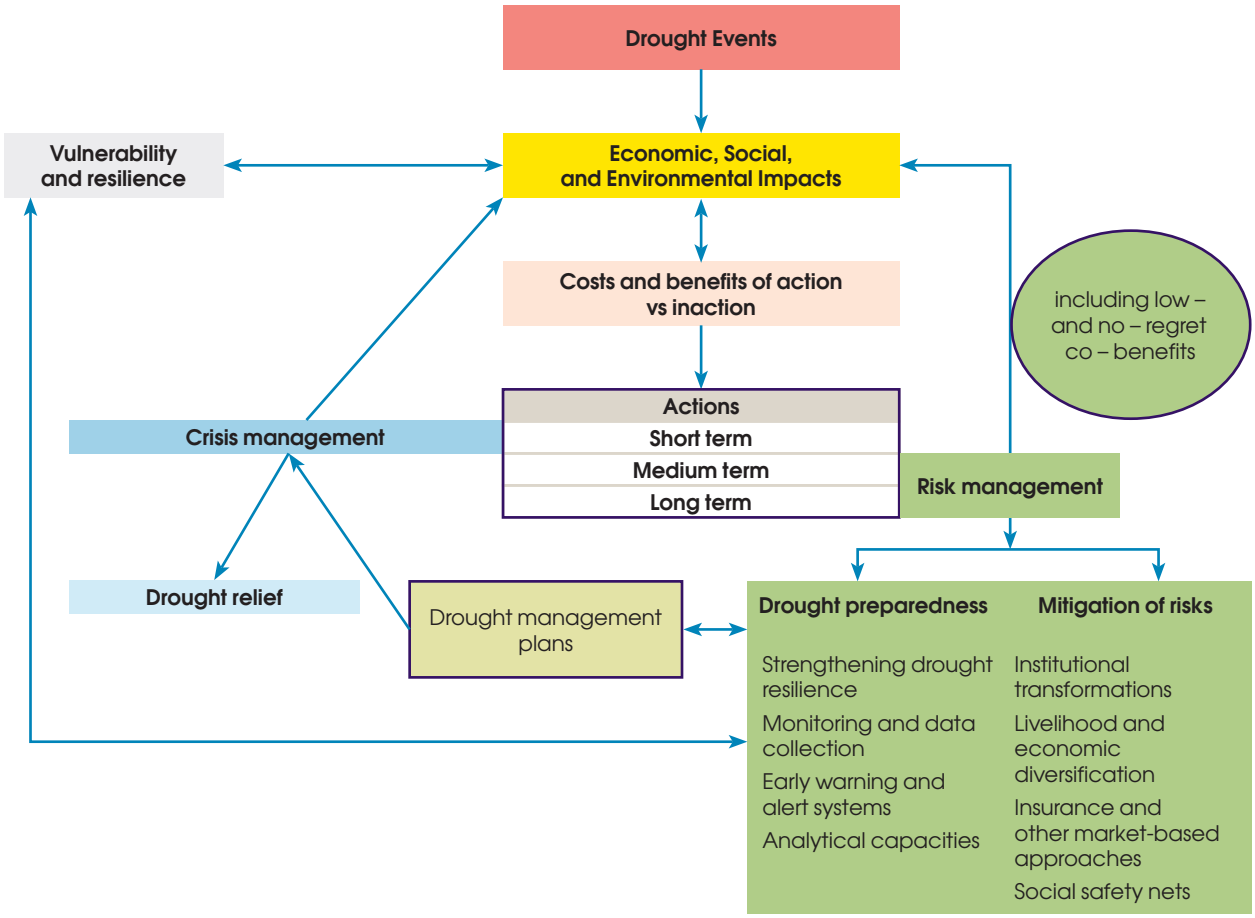
Conceptual Framework

Drought is a natural hazard, so its occurrence can be assessed by attaching probabilities depending on local biophysical and climatic conditions (Wilhite 2000). However, drought impacts are shaped by the socioeconomic context of the affected areas. This includes their vulnerability and resilience to droughts—that is, their level of drought preparedness. Vulnerability and resilience to droughts are affected by actions to mitigate drought risks and increase drought preparedness. Drought preparedness involves actions undertaken before droughts occur in order to improve operational and institutional responses to them (Kampragou et al. 2011). On the other hand, drought risk mitigation actions include a variety of risk management activities carried out before the droughts occur in order to minimize their impacts on people, economy, and environment (Figure 1).

In the past, a usual course of action taken in Uzbekistan was to respond to the impacts of droughts once they had occurred through crisis management, rather than proactively improving resilience against drought impacts through the use of appropriate risk management strategies (FAO 2017). In fact, information on the costs and benefits of mitigation actions is lacking, so governments may often be reluctant to make costly investments in drought risk mitigation (Ding, Hayes, and Widhalm 2011).

Moreover, under various uncertainties and with a shortage of empirical evidence of the higher efficiency of drought risk mitigation actions, it may be economically rational to respond to droughts only after shocks (Zilberman et al. 2011). Economic theory shows that, under conditions of uncertainty, actors will delay irreversible investments until their net benefits exceed a positive critical value (McDonald and Siegel 1986). Zilberman et al. (2011) indicate that major changes in institutions and technological adoptions are likely to happen ex post as a response to droughts. For example, the drought of 1987–1991 in California led to the wider adoption of water conservation technologies (sprinkler irrigation), fallowing land, and lining canals to reduce water loss, as well as the introduction of water trading—even though these measures had been recommended for a long

Figure 1: The Conceptual Framework of the Review



Source: Based on WMO and GWP 2017.

time before the occurrence of the drought (Zilberman et al. 2011).

Although ex post actions seem to happen more often, there are also economic reasons for ex ante actions. Drought is a business risk and agricultural producers will try to avoid its costs. They thus have incentives to undertake mitigation actions, but obstacles in Uzbekistan remain in the form of lack of knowledge about drought occurrences (early warning systems) and their impacts (extension and advisory services), and lack of funds (access to credit) (FAO 2017).

Indeed, numerous studies from around the world show that households in many drought-affected areas, as a normal part of their livelihood behavior, continuously apply risk management strategies. However, at the household level, such risk management strategies are often applied in response to past drought shocks. However, such strategies could be made more efficient and forward-looking with the input of available scientific data on climate, droughts, and drought risk mitigation measures, supported by ex ante government policies. Birthal et al. (2015) indicate that, although agricultural households carry out coping actions after droughts—actions that could serve as risk management strategies by reducing their vulnerability to future droughts—they may rarely be able to fully recover the loss of their productive assets due to the impact of past droughts. In fact, drought relief in many developing countries, including Uzbekistan, is not as comprehensive as it might be in some high-income countries, so that affected households are often left to their own devices.

Methodology and Data

Based on the above background and conceptual underpinnings, the case study methodology seeks to work across scales, covering various stakeholders—from farmers to responsible public agencies and institutions. For this purpose, we first conducted a review of the current state of drought-related literature and policies in Uzbekistan and assessed the potential of various alternative technologies as well as institutional and policy options for drought risk management in the country.

Second, using statistical exploratory approaches, we analyzed a nationally representative agricultural household survey from Uzbekistan for major responses that farmers undertook against droughts, their self-assessments of drought impacts, and barriers they faced and opportunities they had for strengthening their resilience against droughts (see Annex 1 for the questionnaire used).[1] Because farmers are the major stakeholders affected by droughts, their views and opinions about the opportunities and barriers for drought risk mitigation would represent a cornerstone of any activities to support drought risk mitigation in Uzbekistan.

Finally, we conducted expert interviews and held discussions with selected stakeholders from Uzbekistan's Ministry of Agriculture and Water Resources, the Tashkent Agrarian University, the Uzbekistan Hydro-Meteorological Service, farmers, farmer associations, national agricultural banks, insurance companies, local administrations, research institutes, agricultural universities, and international partner organizations and other organizations, soliciting their feedback and ideas on the current status quo and their insights and conclusions about drought risk mitigation strategies and approaches in Uzbekistan.

Results and Discussion

The results of the interviews with farmers show that absolute majority of farmers (94 percent) had experienced drought shocks during the previous five years. There were no significant differences in terms of drought experiences across different categories of farmers (lower-, middle-, and higher-asset farmers). However, there were significant differences in the actions they took in response to droughts: 60 percent of higher-asset farmers undertook drought response and drought risk mitigation actions, but only 21 percent and 30 percent of lower- and middle-asset agricultural producers, respectively, carried out such drought coping actions (Table 1).

Most farmers (70 percent) reported that they had experienced drought only once during the previous five years. Sixteen percent had experienced drought twice, 5 percent three times, and about 1 percent of farmers seem to have experienced drought almost every year during the previous five years.

Counterintuitively, more frequent experiences of drought were reported not in the downstream areas (Karakalpakstan), but in midstream (Kashkadarya) and upstream (Andijan, Tashkent) provinces in Uzbekistan. In most of the previous literature and development activities, the focus areas for drought coping interventions were mostly in downstream areas in Uzbekistan. Arguably, during large-scale droughts, those downstream areas are affected the worst. However, it seems that—at least in terms of farmers' perceptions of water availability—drought conditions are experienced more frequently in the upstream, more heavily populated areas of Uzbekistan.

This finding calls for a wider focus in drought mitigation policies and for targeting not only extreme cases

[1] The farmer interviews were conducted by the International Center for Agricultural Research in the Dry Areas (ICARDA) (Mirzabaev 2013) in 2010–11 across all major agro-ecological zones in Uzbekistan. The sample size was 400 farmers. The survey contains detailed information on farmer characteristics, agricultural production data, non-farm income and employment, experience of drought shocks and measures that farmers undertook to cope with drought impacts, the barriers for coping measures against drought impacts, farmers´ self-assessments of drought impacts, access to extension, and other variables.

Table 1: Drought Experiences and Farmer Coping Actions

Farmer categories by income	Experienced drought shock		Took action	
	No (%)	Yes (%)	No (%)	Yes (%)
All farmers	6	94	63	36
Lower-asset farmers (*N* = 150)	9	91	79	21
Middle-asset farmers (*N* = 101)	6	94	70	30
Higher-asset farmers (*N* = 131)	2	98	40	60

Note: Asset categories correspond to lower, middle and higher terciles of assets value (including house, car, other durables, and jewelry). In their monetary values, these represent for lower-asset farmers: US$0 to 10,000; for medium-asset farmers: US$10,001–30,000; for higher-asset farmers: US$30,001–90,000.

of drought but also milder cases. In terms of their economic impacts, milder droughts in highly productive and heavily populated areas might be actually more significant than more severe droughts in less productive and less populated downstream areas. Addressing this issue also requires focusing drought risk mitigation activities not only on hydrological droughts, but also on economic droughts (seen in the growing imbalance between supply and demand of water).

The most frequently used drought risk mitigation actions among all types of agricultural producers were changing crop varieties and crop types (19 percent) and changing planting dates (8 percent); fewer agricultural producers applied water conserving and sustainable land management (SLM) practices, reduced the area of cultivated land, or carried out other drought risk mitigation activities such as shifting from crop production to livestock rearing (Table 2). These categories of drought responses are also the ones that are common in other arid drought-prone areas around the world (WMO and GWP 2017). Uzbekistan, in this regard, could learn from the experiences of these other drought-affected countries in establishing drought preparedness and drought risk mitigation plans.

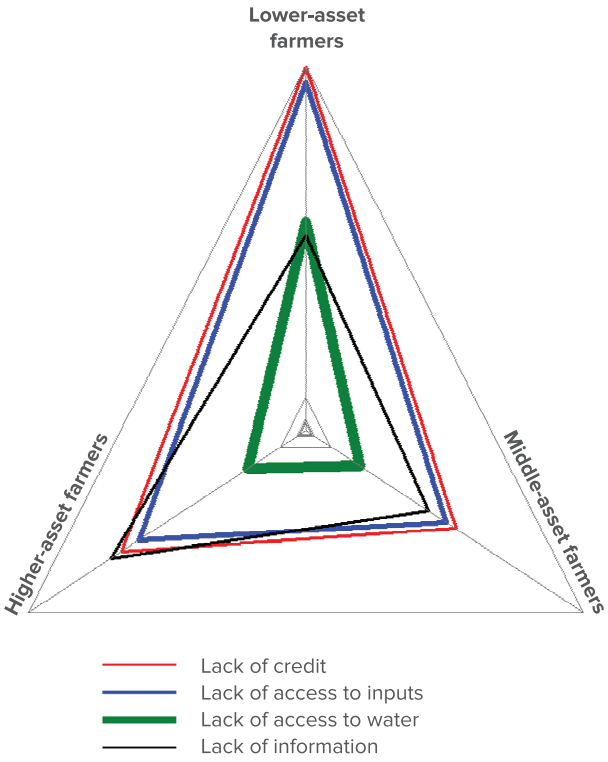
Among the barriers to taking drought coping actions, lack of access to credit and inputs came out as the major impediment, especially for lower-asset agricultural producers (Figure 2).

The fact that most farmers used their own savings to fund the needed coping activities also points to a lack of access to credit and lack of drought insurance, which could be major areas for developing drought risk mitigation strategies in Uzbekistan. Access to information (extension) and knowledge about SLM and water conserving agronomic practices was also found to be highly positively associated with under-

Table 2: Type of Drought Responses by Farmer Asset Category

Type of action in response to droughts	Share (% of total)	Share (% of lower-asset farmers)	Share (% of middle-asset farmers)	Share (% of higher-asset farmers)
No action	63	79	70	40
Planted different crop or crop variety	19	14	15	31
Changed planting dates	8	3	10	15
Applied water/land conserving practices	5	1	2	4
Others (e.g., shifted to livestock)	4	2	2	7
Reduced cropped land	2	1	1	3

Figure 2: Major Barriers to Drought Coping Actions, by Farmer Asset Category



Source: Based on Mirzabaev 2013.

taking drought coping and mitigation activities (Figure 3). Similarly, those farmers with more diversified cropping portfolios were found more likely to undertake drought coping and mitigation actions (Figure 4).

All in all, the analysis of interviews with agricultural producers showed that drought is one of the major environmental hazards affecting their productive activities. However, only about one-third of agricultural producers carried out drought coping and mitigation activities. Major factors that could strengthen and improve drought resilience were found to include better access to extension and knowledge about SLM and water-conserving agronomic practices, improved opportunities for crop diversification, and improved access to credit. It was also found that households did not use any drought insurance options—hence their development and wider use could be a major contribution to improved drought resilience in Uzbekistan. Unlike the accepted convention that the downstream areas are those most affected by droughts, the findings indicate that upstream and midstream areas are not less affected. Considering their relatively higher productivity and more dense populations, improving drought preparedness and resilience in these upstream and midstream areas could have considerable economic benefits.

These findings are in line with broad drought impact and mitigation literature from around the world. Experiences from other countries also show that, for example, better access to agricultural extension facilitated the adoption of drought risk mitigation practices among agricultural households in Bangladesh (Alam 2015). Similarly, Kusunose and Lybbert (2014) found that access to credit plays a major role in coping with droughts among farmers in Morocco. Holden and

Figure 3: Knowledge of SLM Practices and the Likelihood of Drought Risk Mitigation

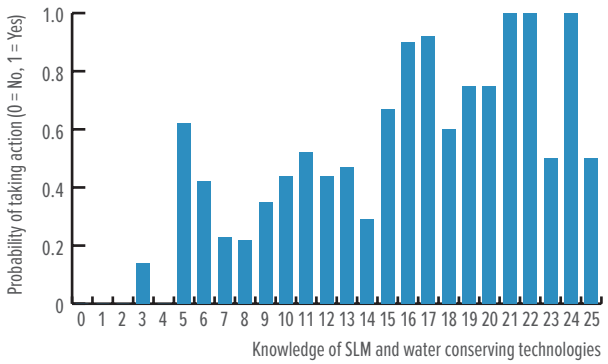
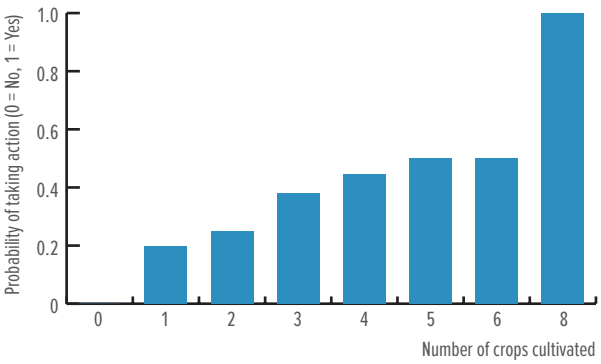


Figure 4: Crop Diversification and Drought Actions



Note: SLM = sustainable land management..

Shiferaw (2004) found that higher access to credit helps farming households in Ethiopia to better cope with drought impacts by helping them avoid divesting their productive assets. In other countries as well, land use change and the modification of cropping patterns were frequently used to build resilience against droughts (Lei et al. 2014: China; Deressa et al. 2009: Ethiopia; Huntjens, Pahl-Wostl, and Grin 2010: Europe; Willaume, Rollin, and Casagrande 2014: France). Another frequently used drought risk mitigation strategy consisted of diversifying livelihood sources to non-farm activities (Sun and Yang 2012: China; Kochar 1999: India; Kinsey, Burger, and Gunning 1998: Zimbabwe), and divesting livestock assets (Kinsey, Burger, and Gunning 1998; Reardon and Taylor 1996: Burkina Faso). The World Meteorological Organization (WMO) and Global Water Partnership (GWP) (2014) indicated that among the key characteristics of drought-resilient households in Kenya and Uganda were a strong asset base and diversified risk management options, which were primarily the result of their higher education levels, enabling them to have more knowledge about coping actions against various hazards and also providing them with more income-generating opportunities. These similarities in drought responses and drought risk mitigation activities in Uzbekistan and other countries around the world may provide highly useful opportunities for studying and learning from the lessons of global experiences from drought risk mitigation policies while strengthening drought risk mitigation strategies in Uzbekistan.

Stakeholder Groups

The analysis of stakeholder groups focused on farmers, farmer associations, water user associations, rural advisory services, national agricultural banks and insurance companies, local administrations, the Ministry of Agriculture and Water Resources, the Ministry of Emergency Situations, Uzhydromet (the hydro-meteorological service), research institutes, agricultural universities, and international partner organizations.

The interviews included a discussion of linkages and collaborative activities in this network of organizations (Figure 5), including discussion of their current roles as well as expectations of future contributions for drought risk mitigation activities in Uzbekistan.

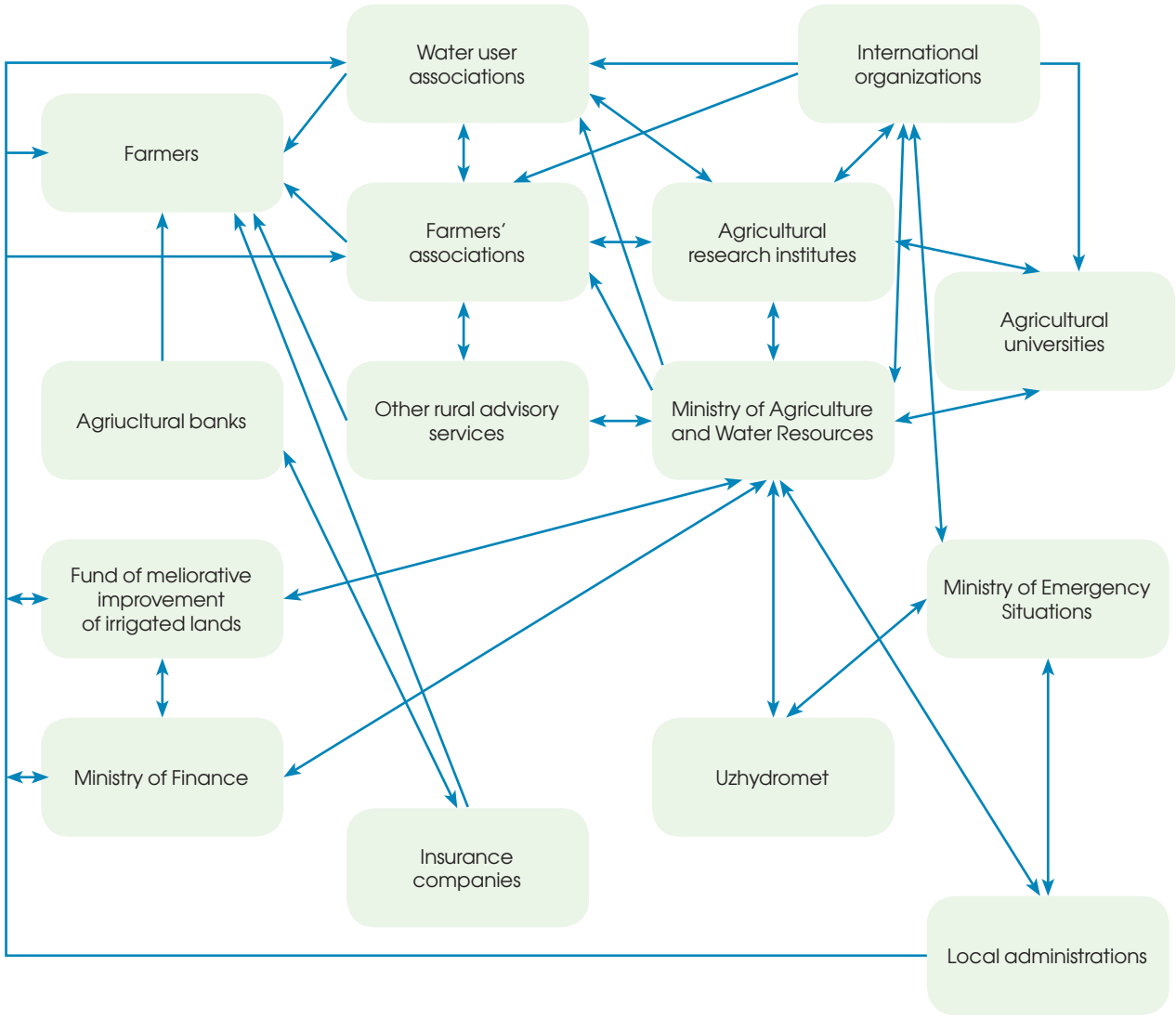
Government Stakeholders

The Ministry of Agriculture and Water Resources and Uzhydromet were mentioned as major organizations with institutional roles in mitigating drought risks and providing early warning and forecasts on droughts. In this regard, Uzhydromet operates the National Center for Drought Monitoring, the major function of which is to provide early warning and propose measures to alleviate the impacts of droughts under a changing climate. At the same time, several respondents highlighted the need for Uzhydromet to improve its work not only on monitoring and forecasting droughts, but also on the timely provision of drought-related information to other relevant organizations, specifically to local administrations, as well as to farmers through mass media. Currently such communication is deemed relatively slow and goes through complicated administrative channels. Moreover, it was suggested that the Ministry of Agriculture and Water Resources should take into account these forecasts while planning agricultural activities; it should also inform relevant organizations so they can take necessary actions to mitigate drought or develop drought risk mitigation strategies in coordination with local authorities.

Research Institutes

Although representatives of several research institutes interviewed indicated that they are making significant efforts to breed new drought-resistant crop varieties, the links between these research institutes and farmers, seed companies, and rural advisory services appear to be quite weak or even nonexistent. Many of the improved drought-resistant varieties are recommended to the government (through the Ministry of

Figure 5: Schematic Map of Stakeholder Interactions on Drought Risk Mitigation and Preparedness



Agriculture and Water Resources); it is then expected that the government should spread these varieties to farmers. Alternative approaches of working directly with seed companies and farmers are rarely practiced.

Associations and Advisory Services

Farmer associations, rural advisory services, and water user associations were considered to be highly important for providing farmers with knowledge of drought risk mitigation activities such as new drought-resistant crop varieties, modified agronomic practices, and the application of SLM and water-saving irrigation practices. However, despite their ongoing efforts, the use of SLM and water-conserving irrigation practices remains low. Few if any studies identify the reasons behind such low adoption. Research institutes and universities could play a bigger role by conducting such studies and providing insights on what needs to be done to improve technology uptake.

The Ministry of Emergency Situations

The role of the Ministry of Emergency Situations directly relates to drought crisis management. During the severe drought of 2000–01, the Ministry of

Emergency Situations played a vital role in providing the affected populations with access to potable water and emergency food aid. Although it does not engage directly in ex ante drought risk mitigation activities, it seems a combination of drought crisis preparedness actions involving the Ministry of Emergency Situations with drought risk mitigation activities led by other stakeholders would provide synergies that are not available when isolating drought crisis preparedness from drought risk mitigation.

Insurance Companies

Currently, insurance companies are playing an increasing role in providing drought insurance to farmers. However, only 30 percent of crops were reported to be covered by any insurance. Since the insurance is indemnity-based, it requires lengthy verification procedures for triggering the payments. Moreover, to qualify for payments farmers need to have strictly followed the agronomic recommendations set out by the Ministry of Agriculture and Water Resources for each region and crop, which leaves room for arbitrary interpretations and lack of transparency. Alternative index-based approaches could provide new opportunities by not only reducing transaction costs (resulting in lower insurance fees), but also with more transparent ways of triggering payments. However, establishing a well-functioning index-based insurance system would require much closer cooperation and exchange between Uzhydromet, research institutes, and insurance companies than is currently practiced. Furthermore, opening up the insurance market to new entrants and increased privatization of state-owned insurers could also provide some boost to the demand-driven and customer-oriented approaches in the work of insurance companies.

Stakeholder Coordination

The major conclusion of the stakeholder analysis is that numerous organizations are contributing vital elements of drought risk mitigation strategies in Uzbekistan, but what is lacking is effective institutional coordination of these different actors and their roles. In this regard, the development of a national drought risk mitigation and preparedness strategy could be a vital step for improving the coordination between stakeholders. Moreover, establishing a permanent, even if relatively small, unit that will coordinate these drought risk mitigation and preparedness activities under the Agro-Industrial Sector of the Cabinet of Ministers (in contrast to a previously used mechanism of ad hoc commissions to coordinate drought crisis response actions) could provide an important step for the transition from drought crisis management to drought risk mitigation approaches in Uzbekistan.

Stakeholder Analysis and Policy Actions for Drought Risk Mitigation

This section turns to institutional and stakeholder analysis. The interviews with various stakeholders also suggested a number of policy actions capable of contributing to drought risk mitigation in Uzbekistan. In contrast to expectations, broad similarities and complementarities were seen in the types of drought risk mitigation strategies proposed by the interviewed stakeholders, rather than contradictions or mutually excluding options.

As noted earlier, crop diversification—including a wider use of drought-tolerant crops and crop cultivars—was mentioned by farmers as the major drought risk mitigation strategy that they undertake. During the interviews, all institutional stakeholders further emphasized the role of crop diversification, as well as crop variety diversification—that is, they all emphasized breeding and disseminating new drought-resistant cultivars. In fact, crop diversification—as a response not only to droughts but also to the growing problems of land degradation and for

improving agricultural profits—has been increasingly promoted by the government as well. Presidential Decree No. 2460, from December 29, 2015, sets out a longer-term strategy to diversify and intensify crop production in the country whereby, between 2016 and 2020, about 170,000 hectares of cotton fields and about 50,000 hectares of wheat fields will be reallocated to other crops such as fruits, vegetables, oilseeds, forage crops, and legumes.

Reallocating land may not be sufficient by itself, however. To introduce more drought-tolerant forage crops such as barley, rye, maize, sorghum, and Sudan grass, domestic seed supply chains need to be developed. Moreover, current breeding programs mostly concentrate on developing new drought-resistant varieties of wheat and cotton. More efforts are needed to develop drought-resistant varieties of other crops, which will increasingly occupy larger arable areas in Uzbekistan.

Improving water use efficiency in agriculture was mentioned as another key priority area for drought risk mitigation by almost all interviewed stakeholders. There are several suggested approaches to do this.

First, cleaning and good maintenance of irrigation and drainage networks was cited as key for improving water conveyance efficiency and reducing water losses. In this regard, it was highlighted that the Fund for Improvement of Irrigated Lands under the Ministry of Finance has been channeling significant investments and efforts for cleaning drainage and irrigation systems in Uzbekistan, especially for the larger irrigation and drainage canals. At the same time, more needs to be done to improve the maintenance of local, smaller irrigation and drainage networks, which fall under the responsibility of local water user associations.

At the farm level, adopting water-conserving irrigation techniques could contribute to water saving and a higher productivity of water. For example, the Government of Uzbekistan has been investing in the expansion of drip irrigation by providing access to soft credit to farmers. However, proper water management is not easy in the irrigated conditions of Uzbekistan. The complex management requirements depend on geographical location, topography, fragile geomorphology, and farm size, as well as aspects of local water distribution. There is a need for "precision irrigation" based on a more accurate estimation of the real water needs of each crop. In this context, some stakeholders emphasized that there is also a need to improve the work of water user associations not only for improved efficiency, but also for equity of water distribution.

For higher impact, crop diversification and improving water use efficiency could also be combined. In 2007, the Government of Uzbekistan decided to increase production and improve water use efficiency by increasing intensive orchards areas—that is, orchards with a very high planting density. The area of intensive orchards has been steadily growing in the last 10 years and is currently estimated to be 43,000 hectares; all intensive orchards are using only the drip irrigation system. Bobojonov et al. (2013) reported that introducing crops that demand less water with a higher water productivity (meaning higher profits per cubic meter of water used) than wheat, cotton, and rice will become especially attractive in the downstream and tail end areas of the irrigation systems. Even though crops such as mung bean, maize, and sorghum currently have relatively low profits, nevertheless they may become suitable alternatives where the availability of irrigation water is not high enough to allow for the planting of high-water-demanding crops.

The responses of various stakeholders also pointed out the need to improve the extension and rural advisory services on SLM (for example, conservation agriculture practices and the expanded application of improved land leveling, such as the currently growing use of laser-guided land leveling) and water-conserving irrigation methods. This coincides

with the findings from farmer interviews, where lack of access to extension was also found to be a major deterrent to undertaking drought risk mitigation activities. One respondent also highlighted the importance of developing drought insurance, providing opportunities for off-farm employment, and employment diversification.

Three insurance companies provide drought insurance coverage in Uzbekistan: these are Uzagrosugurta, Agroinvest, and Halq sugurta. Murodullaev, Bobojonov, and Mustafaqulov (2014) note, however, that only 30 percent of crops in Uzbekistan were covered by insurance, including not only drought but such other events as wildlife crop damage, strong wind, and hail. In many cases, this insurance has high transaction costs because each event against which a claim is made would need to be verified on the ground; moreover, the insured farmers are required to follow the agro-technical norms set out by the Ministry of Agriculture and Water Resources for each crop (which are not always easy and may not make economic sense to a farmer) in order to qualify for drought payments. To spread coverage by reducing transaction costs, there is a need to expand opportunities and technical basis for index-based insurance options.

Among the specific measures suggested by a number of respondents was to increase the number of water reservoirs. In our opinion, however, this may not provide a viable solution because presently there are 55 reservoirs with a capacity of 20 cubic kilometers in total (more than a third of the water used annually in Uzbekistan's agriculture) that are already able, to a large extent, to accumulate any excess water during high water years to release during drier years. Adding more reservoirs may lead to greater evaporation, leading to more water loss. The main reason for the severity of the impact of droughts is not the lack of reservoirs that can mitigate these impacts, but seems to be a widening gap between available supplies of water and growing water use. Hence supply-side measures—such as minimizing water losses in the drainage and irrigation canals—are vitally important. At the same time, success in improving the resilience against droughts would largely depend on demand-side actions targeting ways to improve water use efficiencies and reduce overall water use in agriculture.

The interviews emphasized that current activities of monitoring and forecasting droughts would need to be significantly strengthened by investing in more granular and frequent weather and hydrological data collection and improved hydro-economic modeling of drought impacts. However, the crucial aspect stressed by several respondents was the provision of open access to such early warning signals, as well as to the climate and weather data. There are important opportunities for research institutes and universities to contribute by modeling the effects of drought on crop production and water availability, for which having open access to data is also essential.

Several respondents emphasized the need to boost the coordination of drought policies and programs, including linking information on monitoring, forecasts, and early warnings with long-term drought resilience strategies in agriculture. In this regard, the National Center for Drought Monitoring under Uzbekistan's hydro-meteorological service (Uzhydromet) could play a more active role in collaboration with the Ministry of Agriculture and Water Resources and its local administrative branches.

Finally, respondents also highlighted the need to develop a national strategy for drought risk mitigation and preparedness, which could provide the basis for such well-defined inter-agency collaborations. The national drought risk mitigation and preparedness strategy would need to include improved information about the impacts of past droughts (direct and indirect, immediate and longer term), including impacts not only on agricultural productivity but also economy-wide effects on incomes, poverty, and food security. Respondents suggested that such a national strategy should

also systematize the available knowledge concerning drought adaptation strategies (including technologies and approaches in agriculture and natural resources management) as well as strategies that support producer and farming communities via risk management (insurance).

Conclusions and Policy Implications

The findings of this case study show that improved access to extension and credit along with diversified cropping portfolios were highly related to farmer drought coping and drought risk mitigation actions. Stakeholder analyses pointed out that major consensus-based drought risk mitigation policy actions in Uzbekistan could improve water use efficiencies by cleaning and good maintenance of irrigation and drainage networks, developing drought-resistant cultivars, adopting water-saving irrigation technologies, and improving market access for farmers—including access to drought risk insurance. See Box 1 for a summary of recommended options.

Box 1: Summary of Recommended Drought Risk Mitigation Options

- ✓ Diversify crops
- ✓ Breed drought-resistant crop varieties and produce their seed, including for the diversification crops
- ✓ Improve water use efficiency in agriculture
- ✓ Improve extension and rural advisory services
- ✓ Expand drought insurance products, specifically index-based drought insurance approaches
- ✓ Improve monitoring and forecasting of droughts (data collection, hydro-economic modeling, and open access to data)
- ✓ Strengthen the coordination of drought response and risk mitigation activities
- ✓ Develop a national strategy for drought risk mitigation and preparedness

Stakeholder responses indicate widespread understanding and agreement about the necessity of drought risk mitigation activities, but what seems to be lacking is stronger inter-agency links and coordination, and the national-level strategy framework guiding these drought risk mitigation and preparedness activities.

In this regard, further research is also needed across the agro-climatic zones to address the effects of various types of water management and irrigation regimes and to breed new drought-tolerant crop varieties under different crop rotations. There is also a lack of studies that identify the reasons behind low adoption of SLM and water-conserving practices and suggest ways to improve such technology adoptions. There are significant knowledge gaps on drought impacts and related quantitative cost-benefit analyses of reactive versus proactive actions for drought risk mitigation. When there is a lack of information on the costs and benefits of drought risk mitigation actions, the Uzbekistan government would naturally be reluctant to make costlier investments in drought risk mitigation activities.

The key recommendation coming from the stakeholder interviews was to develop a national drought risk mitigation and preparedness strategy. This strategy needs to be based on the latest research findings on the impacts of droughts, including impacts not only on agricultural productivity but also economy-wide effects on incomes, poverty, and food security. Such a national strategy is also expected to systematize the available knowledge on drought adaptation strategies and set the framework for inter-agency coordination of drought risk mitigation and preparedness activities.

Teaching Assignment (Extended Classroom Game-Oriented Version)

The Government of Uzbekistan is organizing a national discussion for identifying major drought risk mitigation policies/actions and, based on this discussion, is developing a national strategy for drought risk mitigation. For this purpose, representatives from some of the various stakeholder groups were invited to participate in the discussion, including (1) farmers, (2) meteorological service, (3) the Ministry of Agriculture and Water Resources, (4) research institutes and universities, and (5) agricultural service providers (extension, banks, and insurance companies). The students are divided into these five categories of stakeholders. After a careful reading of the case study and of the recommended literature sources, each stakeholder group should identify:

1. What contributions can the stakeholder group make to promote drought resilience in the country?

2. Which barriers and problems does the group face in implementing its activities for drought risk mitigation?

3. What kind of input/support from each other stakeholder would the group need?

In the second round of discussions, each stakeholder group will make a presentation that includes whether or not it can provide the inputs and support requested by other stakeholders for drought risk mitigation activities, and what it may additionally need in return from other stakeholders. The stakeholder groups are allowed to evaluate and criticize each other's suggestions in case they do not seem to make sense from their perspectives. The discussion could be continued—ideally until consensus emerges among various stakeholder groups.

The purpose of the assignment is for students to better understand the interactions between various stakeholder groups, opportunities for collaboration, and existing barriers and problems with drought risk mitigation. The discussion facilitator should, from the beginning, make clear that the government is willing to invest sufficient funding to carry out these proposals, so that the students' creative thinking and proposed solutions are not limited or always reduced to funding availability, but instead are liberated for generating novel and out-of-the-box ideas.

Teaching Assignment (Brief Homework-Oriented Version)

The Government of Uzbekistan is organizing a national discussion for identifying major drought risk mitigation policies/actions and, based on this discussion, is developing a national strategy for drought risk mitigation. Based on your reading of the case study and other recommended materials, please answer the questions below from the perspectives of each of the following stakeholder groups: (1) farmers, (2) meteorological services, (3) the Ministry of Agriculture and Water Resources, (4) research institutes and universities, and (5) agricultural service providers (extension, banks, and insurance companies):

1. What contributions can the stakeholder group make to promote drought resilience in the country?

2. Which barriers and problems does the group face in implementing its activities for drought risk mitigation?

3. What kind of input/support from each other stakeholder would the group need?

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Annex 1

Questionnaire
Introductory Remarks

This questionnaire is about identifying the key aspects of improving drought resilience in the agricultural sector in Uzbekistan and the role different organizations play in this process. We would like to especially focus on ideas for future measures that can help manage drought risks in advance before the occurrence of droughts, rather than only as crisis management after their occurrence. All data and information gathered for this study will be summarized for analysis and contribute to the preparation of a report on improving drought resilience in Uzbekistan. We thank you very much for your suggestions and inputs.

1) Name of the respondent

2) Position, organization

3) Please state how your organization is related to dealing with drought impacts:

   a) not at all b) somewhat
   c) closely d) very closely

4) What are the specific areas of addressing droughts that your organization is engaged in?

5) In your view, which organizations play a key role on addressing the impacts of droughts in Uzbekistan? Please list.

6) In your view, which organizations should play a bigger role in addressing the impacts of droughts? Please also say what actions these organizations should undertake.

7) Which are the key organizations that you work together in addressing drought impacts? Please rank by importance.

8) International practice shows that preparing in advance to deal with future droughts is often much cheaper than addressing the impacts of droughts.

   a) agree b) disagree

9) What are the actions and measures that are, in your opinion, necessary to strengthen such future drought preparedness and resilience in Uzbekistan? Please rank from the easiest to most difficult to implement.

10) Do you have any previous experience of dealing with droughts? If yes, when? Was it a severe drought or mild? What did you do to cope with drought and its impacts?

11) IF such a drought is expected next year, what should your organization do to be prepared for this?

The Political Economy of Wheat Pricing in Uzbekistan

Bakhrom Mirkasimov, Ziyodullo Parpiev

Executive Summary

Wheat is an essential food product for Uzbekistan since it provides the largest share of calories and nutrition to the Uzbek people. Wheat also occupies the largest harvested area in the country. Wheat, along with cotton, is considered one of the Uzbekistan's two "strategic crops." Because of wheat's importance, the government has retained significant elements of the central planning system from Soviet times in the form of a state procurement system. Through the state's procurement, the government effectively not only controls procurement prices, but also dictates the area in which wheat should grow and the quantity produced. The system has consistently underpaid farmers for the wheat they produce. How sustainable and fiscally sound are these policies in the long run?

Because of its ability to set procurement prices below market prices, the government is also able to maintain significant subsidies for wheat flour, bread, and other wheat-based products available to all citizens. The government has asserted that subsidies for what is called "social bread" and wheat products protect vulnerable people and provide them with food security. How efficient are these subsidies without effective targeting?

In this case study, we discuss the **consequences of maintaining specific wheat production, consumption, and trade policies for different stakeholders**. We show that wheat prices are not only influenced by domestic policies but also by international factors. We also look at the ability of the current system to withstand negative external shocks such as the 2007–08 international food crisis. We approach the policy options from the viewpoint of different stakeholders—namely the government, farmers, and consumers. We also consider issues such as regional trade and its role in cushioning the shock of the international food crisis of 2007–08. Though we frequently refer to the initial conditions Uzbekistan faced in the beginning of the 1990s, we focus on the period since 2007 to better understand the Uzbek government's evolving policies in wheat/flour/bread production, consumption, and trade.

Our **objective** is to identify and justify the most important **policy options to better respond to wheat price changes.** To achieve this objective, it is first necessary to understand the political economy of wheat pricing policy. We then provide a list of important policy options for stakeholders, ranging from abolishing the state procurement system to letting farmers decide to grow and trade crops of their choice; and from investing in technology and farmers' education to boost agricultural productivity to building analytical capacity to produce reliable and timely statistical information at the farm level. We conclude this case study with the hopeful observation that the government of Uzbekistan lowered import duties and excise taxes for wheat and other food products beginning on October 1, 2017.

Background

Uzbekistan has pushed hard to achieve self-sufficiency in wheat production, repositioning land and resources into the sector. However, the country remains one of the biggest wheat and flour importers in the region. In its *Grain Market Report* (2017), the International Grains Council (IGC) puts total grains production in Uzbekistan at 7.1 million metric tons in 2015–16, compared with 7.6 million in 2014–15. Total wheat imports are estimated at 2.2 million metric tons in 2015–16, a slight increase compared with 2.1 million metric tons imported in 2014–15.

One of the reasons Uzbekistan imports a significant amount of wheat is the low baking quality of domestically produced wheat. Kienzler et al. (2011) show that the country's current land tenure policies, which prioritize quantity over quality, do not stimulate diversification of wheat varieties and do not result in the production of better-quality wheat. Because of its low quality, a significant proportion

of domestically produced wheat is used to feed animals. Livestock farmers are increasingly using grey loaf bread to feed animals because the frozen bread prices make it competitive compared to, say, mixed fodder.

The more domestic bread and wheat products become subsidized, the higher the difference between state procurement prices and market prices. In this sense the procurement prices are "hostage" to subsidies and cannot be raised easily. Raising the procurement prices for wheat leads to increased costs of state-owned mills and bakeries, which in its turn would need to raise retail prices for bread or risk going bankrupt.

Production

Since 1991, wheat production has increased dramatically. In pursuit of wheat self-sufficiency, the government has increased the area harvested and taken the necessary steps to improve yields with a combination of improvements in seed quality and extension services. In the 1990s, the government also dismantled collective farms—*kolkhoz* and *sovkhoz*—and distributed agricultural land among farmers. As a result of these reforms, there are two types of agricultural producers—conventional farms, which are organized as legal entities and specialize in cotton, wheat, vegetables, or orchids (or a combination), and individual households that grow agricultural produce in their small land plots. The latter group is called *dekhan* farmers, and they operate with little coercion from the government in terms of what to cultivate, how to cultivate, and where to sell their harvest. Sometimes the former group is referred to as commercial farms, while the latter group is characterized as subsistence farming.

The local government authorities (district and regional authorities, called *khokimiyats* in Uzbek) dictate commercial farms' choice of crops, find input suppliers (of seeds, fuel, and fertilizers), and set the amount of harvest the farmers will have to sell to the government (more precisely, to a state-owned mill). The government also determines the procurement price, which is the price that farmers get for selling their harvested wheat to the state-owned mills. The state procurement prices for wheat and cotton, along with quotas for the harvest area and plans for yields and production for every region and district, are determined by the central government—the Cabinet of Ministers of Uzbekistan.

The state procurement of wheat is intended to buy only 50 percent of the harvest farmers grow. On paper, farmers can sell the rest of the harvest to the market, making wheat an attractive crop to cultivate. This would work if the farmers could sell half of the wheat they harvest by the end of growing period. But in reality, a production plan set by the state procurement system exceeds actual harvest yield up to two times, leaving the farmers with little wheat to sell to the market. The scheme works this way: suppose a particular land plot can have a yield of 4 metric tons per hectare. The logical action would be to set the state procurement at 2 tons per hectare so that the farmer sells 2 tons to the government and keeps 2 tons. But the local *khokimiyat* often sets the yield from a particular land plot up to 8 tons per hectare, often procuring the entire harvest. This practice not only leaves farmers with little wheat beyond the state procurement, but also greatly inflates official yield statistics for wheat. Indeed, if the farmer sold 4 tons of wheat to the government, he or she must be left with 4 tons of additional wheat. Except there is no additional wheat, and the state procurement system takes away all harvested wheat at below-market prices.

Since 1991, Uzbekistan's population has increased from 22 million to 33 million, and over 43 percent of the population is under 25 years of age. Faced with the challenge of providing the population with sufficient food, the Government of Uzbekistan has pursued the goal of self-sufficiency in the production and consumption of wheat and wheat products

such as bread and flour. Wheat is necessary to be able to produce these food items, but the quality of the produced wheat is not high. Actually, only 55 percent of domestically produced wheat can be used for flour production as a result of its softness (Lyddon 2015).

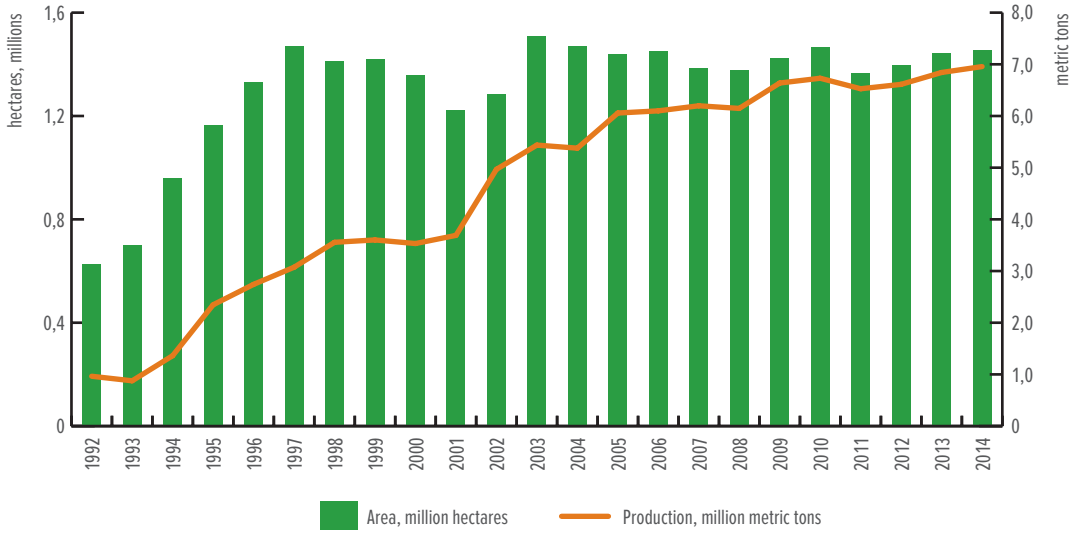
By the early 2000s the Government of Uzbekistan declared that it had successfully achieved wheat self-sufficiency by utilizing a combination of increased harvest area and yield. To achieve this self-sufficiency, the government had to increase area under wheat cultivation at the expense of cotton and livestock fodder crops such as barley, rye, and oats.

Figure 1 shows that both the harvested area and the production of wheat have significantly increased. The wheat harvest area has increased from 610,000 hectares in 1992 to 1,450,000 hectares in 2014, while production of wheat has increased from around 1 million metric tons to over 7 million metric tons for the same period (Figure 1).

In its *Regional Overview of Food Insecurity: Europe and Central Asia 2015*, the United Nations Food and Agriculture Organization (FAO) notes that Uzbekistan delivers state-supplied inputs at discounted prices to farms fulfilling state orders. The report explains that the yield improvement in Uzbekistan is due mainly to a switch from rainfed spring wheat cultivation to irrigated winter wheat cultivation.

Since 1991, per capita production of wheat has increased by more than five times—from 45 kilograms per capita in 1992 to 230 kilograms per capita in 2014. Almost all wheat in Uzbekistan is produced by commercial farmers. In 2014 there were 72,300 large commercial farms, specializing in growing cotton and wheat, and millions of small *dekhan* farms.[1] Of all these farms, 28,500 are diversified and are involved in the production of vegetables, melons, grapes, fruits, livestock, and other products. Although they occupy less than 5 percent of the arable land, *dekhan* farms produce around 60 percent of gross agricultural output and 92 percent of gross livestock goods (CER & UNDP 2013).

Figure 1: Wheat Production and Harvested Area in Uzbekistan



Source: FAO STAT, accessed June 15, 2017. http://www.fao.org/faostat/en/#country/235

[1] In Uzbekistan, all rural households that have household plots are considered *dekhan* farms. It is difficult to verify exact number of such households, but their number is estimated to be around 3 million.

Consumption

Uzbekistan is classified as a country with a wheat-based diet. According to the Ministry of Health of Uzbekistan guidelines, the wheat consumption norm in Uzbekistan is 110 kilograms of flour per person per year, or 147 kilograms grain equivalent. However, production and import statistics, as well as household surveys, indicate that actual consumption is much higher: earlier estimates have put it between 167 and 180 kilograms of bread (CER & UNDP 2005; Christensen 2003). Assuming that more recent data of domestic production (around 7 million metric tons) and imports (2.1 million metric tons) are correct, and all domestically produced and imported wheat and flour are consumed, consumption per capita is actually around 300 kilograms a year. Even assuming that official production statistics overstate actual production (see the discussion in the previous section), per capita consumption of wheat seems to be excessive.

The excessive consumption of wheat might in large part be explained by state subsidies for domestic flour and bread. Because of the state order and state procurement for wheat, the government is able to keep the price of a standard loaf of bread weighing 600 grams, baked from the first-grade flour (called a "grey loaf," and popular among low-income consumers), from increasing. Indeed, the last time the price of grey loaf was increased was April 2013. Since then it has been sold mainly in Tashkent city and all other major cities for 650 Uzbek soms (Figure 2).

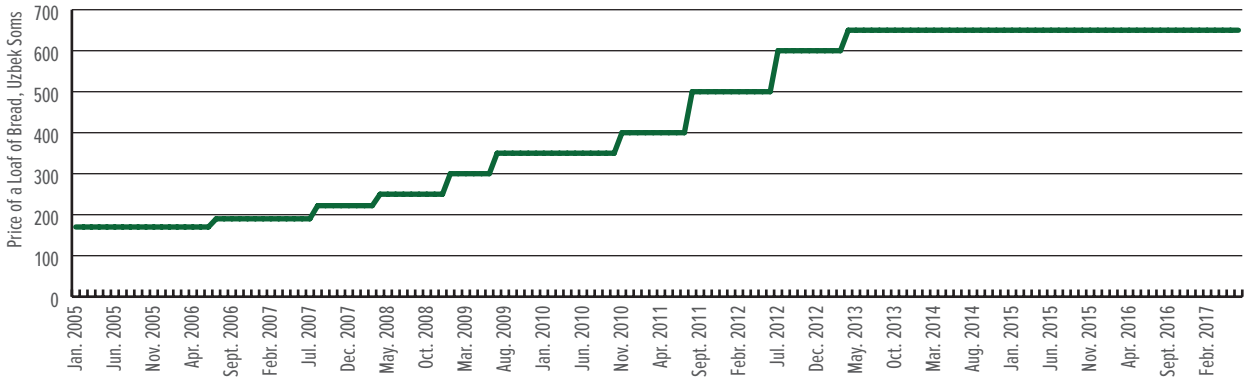
The low price of the grey loaf bread makes it extremely affordable to all groups of population, but fixing its price for several years and keeping it extremely low has resulted in the deterioration of its quality. Therefore more and more people prefer local bread (called *non* in Uzbek) baked in traditional local "tandoor" oven. Prices for this type of bread, baked and sold by private bakeries, are not subject to government regulations and can vary depending on supply and demand.

Trade

Since the mid-1990s, Uzbekistan has had one of the most restrictive trade regimes among the former Soviet Union countries. A ban on exporting certain food items, multiple exchange rates, a requirement for the repatriation of exports proceeds, and the mandatory sale of exports proceeds at the official exchange rates—this is not an exhaustive list of measures restricting exports and imports. In terms of wheat, the export of wheat is prohibited unless there is special permission from the Cabinet of Ministers.

Uzbekistan does not make public its trade statistics for commodities. We therefore rely on mirror statistics from other countries in estimating the volume of

Figure 2: Unit Price of a Loaf of Bread, in Uzbek Soms



Source: The Cabinet of Ministers' resolutions for various periods.

wheat and flour being imported and exported. The US Department of Agriculture (USDA) estimates that Uzbekistan annually imports 2.1–2.2 million metric tons of wheat and flour from other countries, mainly from Kazakhstan and Uzbekistan (USDA 2017). The USDA also estimates that more than 90 percent of the wheat and flour is imported from Kazakhstan. Therefore Kazakhstan firmly remains Uzbekistan's main supplier of high-quality wheat and wheat flour.

Uzbekistan wheat exports are estimated at 400,000–450,000 metric tons of lower grade wheat in the 2015/16 harvest year. The export destinations are reportedly the Islamic Republic of Iran and Afghanistan.

Even before the 2007–08 food crisis, the Uzbek government encouraged the development of the domestic milling industry by imposing cascading tariffs on wheat and flour imports. Even before 2007–08, the government had set higher tariffs on the imports of flour, encouraging the domestic milling industry to import wheat and process it in the country. The 2007–08 food crisis accelerated this process, and in the subsequent years Uzbekistan has mainly imported wheat, not processed flour. In 2013–14, this situation caused trade frictions between Uzbekistan and Kazakhstan, when the Flour Millers Association of Kazakhstan lodged an official complaint with the Kazakh government over the cascading tariff structure Uzbekistan uses to encourage imports of wheat at the expense of flour.

In addition to import tariffs, in 2012 Uzbekistan introduced a 15 percent excise duty for flour, making imports of flour from other countries expensive compared to the imports of wheat. Beginning October 1, 2017, the Government of Uzbekistan abolished an excise tax on certain imported foodstuffs, including wheat flour.

These trade policies have led to a mushrooming of private mills, primarily located in close proximity to Tashkent. By 2016, the number of privately owned mills had reached 60, with a combined annual wheat milling capacity of approximately 2 million metric tons. The majority of these mills use wheat imported from Kazakhstan. The private mills have established the Private Mill Entrepreneurs Association to lobby their interests.

The system of production and consumption may have succeeded in providing the population with affordable bread. However, universally subsidizing the consumption of bread is economically expensive and distorts incentives for producers and processors of wheat. This sends the wrong signals to producers and leads to inefficient allocation of scarce resources.

Policy Issues

All agricultural land in Uzbekistan is owned by the state. Local *khokimiyats* tightly control cropping patterns at large commercial farms, while *dekhan* farms are allowed to grow whatever the farmers wish. Additionally, unlike larger farms where leases must be renewed, leases for *dekhan* farms are lifetime holdings and can be transferred through inheritance. On paper, household plots cannot be sold, but in reality they are routinely sold and bought, with transactions disguised as selling and buying property on the land, not the land itself.

Uzbekistan produces winter wheat in irrigated as well as rainfed areas. In the 2014–15 crop year, of the estimated planted area of 1.45 million hectares, approximately 1.14 million hectares were irrigated. According to official figures, in the 2014–15 harvest year wheat production totaled 7.1 million metric tons. Despite official reports of a bumper crop, some independent observers believe that production numbers were overestimated, as usual. Overestimation of production happens because of Soviet-style planning and state procurement system: as noted earlier, commercial farmers have to sell 50 percent of their harvest to the state-owned mills, and can keep

the rest for personal use. However, the plan for production and yields is set in spring months at a much higher rate, usually 1.5–2 times higher than actual production and yield. Once set, the plan is not adjusted ex post and the farmers are forced to surrender 75–100 percent of their actual harvest.

The state buys almost all of the wheat produced by farmers at a fixed procurement price, which is much below the market price for domestic wheat and flour (Table 1).

Table 1 shows that, in 2007, the difference between state procurement prices and domestic market prices for wheat was lowest—little more than 2 times. In subsequent years, the difference fluctuated significantly, but kept growing and reached 4.54 times in 2016—its highest value. The difference shows how much the government underpays farmers for wheat they produce and are forced to surrender at below-market prices. However, compared with the other strategic crop, cotton, wheat is harvested in June, allowing farmers to cultivate a second crop during the same year. In addition, wheat can be retained for the farmers' own consumption or sold in the domestic market, which is not the case for cotton. Hence wheat provides access to cash, a major production factor.

The state-owned mills purchase wheat from farmers at fixed prices, process it into flour, and sell it to bakeries at specific prices. In general, this system allows the government to provide the population with affordable bread and some other products. However, the system has created a number of problems that, in the longer run, have led to ineffective production and consumption of wheat products and to considerable financial losses for farmers and their employees.

The Government of Uzbekistan has justified the below-market state procurement prices for wheat by claiming it is necessary to protect low-income families from food insecurities. The increasing difference between state procurement and market prices shows to what extent consumers are being subsidized at the expense of farmers.

Apart from imposing a large burden on producers, subsidies for domestic flour and bread can have negative welfare consequences for consumers too. Parpiev and Yusupov (2011) examine the intriguing possibility that bread might be an inferior consumption good. To test this hypothesis, they construct a Tobit estimation with bread as a dependent variable and per capita expenditures and household size, among others, as explanatory variables. The results show that income elasticity of bread consumption for the full sample, as well as for all four quartiles of the population, is consistently negative and statistically significant, indicating that bread is an inferior and income inelastic good (necessity). The inferior nature of bread in Uzbekistan means that people, especially the poorest households, might be consuming too much bread—more than they really would like. And when income increases, they will decrease their consumption of bread by substituting it with other more desirable food.

Table 1: Average Domestic Market Prices and Average State Procurement Prices for Wheat

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Average domestic market price, thousand soms per metric ton	356	520	560	720	1,050	1,150	1,200	1,400	1,900	2,500
Average state procurement price, thousand soms per metric ton	171	187	224	262	336	378	420	462	504	551
Difference between market prices and procurement prices, times	2.08	2.78	2.50	2.75	3.12	3.04	2.86	3.03	3.77	4.54

Source: The Cabinet of Ministers' resolutions for state procurement prices and Potrebitel newspaper for domestic market wheat prices

Because government regulations have kept the price of the domestic bread and other wheat products low, these products have remained affordable to low-income households. But big price distortions have led to inefficiencies in production, processing, and consumption. Instead of moving away from bread and other wheat products as a result of the improved well-being, we observe increased per capita consumption of wheat and wheat products by consumers. Indeed, the increase in production per capita has been accompanied by an increase in the volume of imports for wheat. Through across-the-board subsidization of bread baked from domestic flour, the government policy has probably led to the substitution of other products in the diet with cheap bread and flour products.

The 2007–08 International Price Shocks

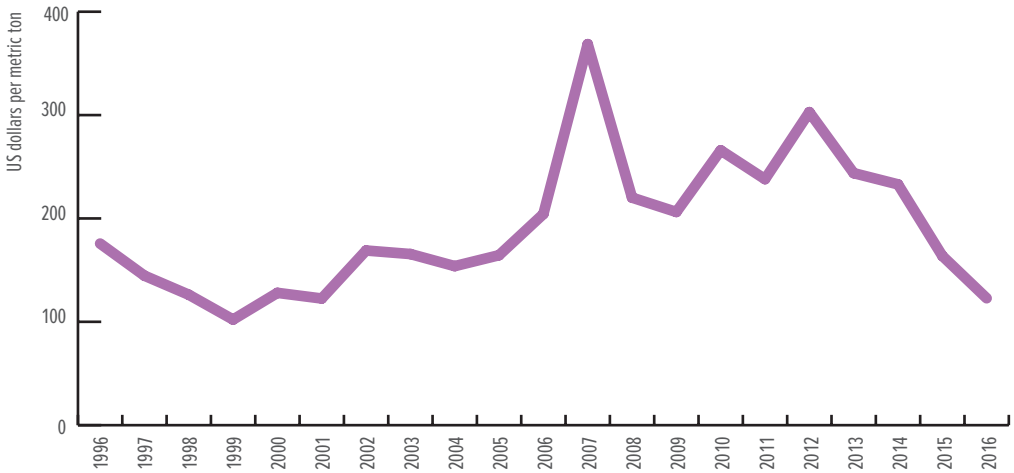
International wheat prices skyrocketed in 2007 (Figure 3). The price of hard red winter wheat per metric ton jumped from US$204.31 in 2006 to US$368.62 in 2007. Figure 3 shows that currently wheat prices are on a decreasing trend.

This 2007–08 price jump in international markets had a significant impact on local prices in Uzbekistan. Imported flour prices jumped and increased by 52 percent (Table 2). Subsequently this had an impact on domestic wheat and flour prices, which went up by 46 percent in 2008. The domestic price for the grey loaf of bread, though heavily subsidized, also increased by 40 percent in 2009. Those were the biggest price changes in the last decade.

It is evident that 2007–09 price hikes for wheat products (flour and bread) were primarily caused by the international price increases for wheat. In 2007, the domestic price of the imported flour and wheat jumped by more than 50 percent, two times faster than overall food price inflation for the year. The following year the price increases transmitted to domestic wheat and flour and, finally, domestic bread. From Table 2 we can see that smaller but similar price increases took place in 2015–16, but the root causes of those price hikes were different—the latter episode of price increases was the result of domestic factors, not external ones.

The Government of Uzbekistan reacted to the 2007–08 food crisis with a combination of supply-side and demand-side measures. On the supply side, the government increased the harvest area for wheat by 50,000 hectares as part of the Anti-

Figure 3: International Wheat Prices



Source: IMF Primary Commodity Prices 2017. http://www.imf.org/external/np/res/commod/index.aspx

Table 2: Staple Food Price Increase between 2005 and 2016 (December to December), Percent

Year	Bread	Flour (imported)	Flour (domestic)	Wheat (domestic)	Food price inflation (Laspeyres index)
2005	0.0	5.8	5.5	6.5	22.7
2006	11.8	11.7	11.0	11.2	15.9
2007	17.0	52.4	25.9	24.0	26.0
2008	12.5	30.3	46.1	46.9	37.5
2009	40.0	2.6	7.7	7.9	12.5
2010	14.3	29.2	28.6	28.4	35.4
2011	25.0	29.0	22.2	45.8	39.4
2012	20.0	20.0	13.6	9.5	8.0
2013	8.3	–10.4	0.0	4.3	6.9
2014	0.0	11.6	20.0	16.7	26.3
2015	0.0	45.8	33.3	35.7	20.8
2016	0.0	14.3	30.0	31.6	18.7

Source: Authors' estimates.

Note: The prices of commodities are for Tashkent city only. The Laspeyres index is used to measure the price development of the basket of goods and services consumed in the base period. It is also known as a base-weighted index.

Crisis Programme to mitigate the impact of global financial crisis on domestic consumers. In addition, starting in 2008, the government also increased area for the cultivation of vegetables by 50,000 hectares. Both increases have been enacted at the expense of the cotton harvest area. The government also increased procurement price for domestic wheat it uses to buy wheat from commercial farms by 17.5 percent in 2008, a significant increase compared to previous years when the average procurement price was in low single digits. On the demand side, the government continued to heavily subsidize domestic flour and wheat. But the price pressure from the international markets forced the government to react and increase the price of domestic grey loaf bread by 40 percent in 2009.

Stakeholders

Stakeholders can be divided into four groups: governmental entities at regional and national levels, consumers, farmers, and private millers.

Governmental Entities

The government is represented by the Cabinet of Ministers, the state-controlled joint-stock company Uzdonmahsulot, and regional and district *khokimiyats*. Uzdonmahsulot deals with the purchase, storage, and processing of state procurement wheat. Uzdonmahsulot is comprised of 44 state-owned mills, their branches, and bakeries. By a presidential decree, Uzdonmahsulot is the only legal entity that is entrusted by the government to purchase and store wheat; produce flour and wheat products such as grey loaf bread, macaroni, and others; control the quality of wheat farmers surrender to the government; attract foreign investment to the wheat processing sector; and help its member companies improve the quality of the wheat products they produce. The list of tasks indicates that Uzdonmahsulot, like many other state-controlled joint-stock companies, have conflicting tasks: on the one hand, it is the only contractor for farmers for wheat they surrender within the state procurement system; on the other hand, they control the quality of wheat and determine the price the farmers are entitled to set

for their harvest. By definition, the government and companies representing the government have highest capability of shaping policies concerned with the production, processing, and consumption of wheat.

Farmers

The farmers are represented by 60,695 commercial farms specializing in the production of cotton and wheat, with an average farm size of 52.7 hectares. Commercial farmers do not own land—rather they lease it from the government, and the lease contracts specify the exact areas that have to be sown with cotton and wheat. The 1998 law "On Farming" further stipulates that leased land should be cultivated with due diligence so as to yield a certain minimum harvest of cotton and wheat per hectare. Presidential Decree No. 3342 (October 2003) states that any deviation from the sowing pattern prescribed in the land lease contract is a grave violation constituting grounds for termination of the farm's lease. Through these tenure-linked obligations, the commercial farmers actually inherited the burden of fulfilling state orders for cotton and wheat that had been traditionally borne by collective and state farms during Soviet times. Commercial farmers have become the state's official suppliers of these strategic commodities. Farmers unite into farmers' associations (since 2015 these have been renamed the "Council of Farmers") and try to affect policy making through these professional associations. However, the Council is not an independent entity, as it depends on local executive power in matters such as the implementation of existing agricultural policies and development of new policies. The voicelessness and powerlessness of farmers have become notorious in the society. One sign of their voicelessness are the "selector meetings" that regional and district *khokimiyats* organize almost daily and that all farmers have to attend for several hours a day: the meetings frequently feature crass comments toward farmers who have not strictly followed instructions of the authorities.

Consumers

Consumers are represented by the entire rural and urban population. Many important decisions concerning consumers and their diet are taken without their input. The major decision that affects consumers' diet is the subsidization of domestic flour and wheat products. To provide support to low-income households, the government continues to regulate the prices of several basic foods, including wheat flour and bread. The policy has affected wheat consumption in important ways: in the short run, the government has successfully curbed price increases for wheat flour and bread, but in the medium and long run the policy has killed farmers' incentives to grow wheat and increase its yield.

Private Millers

Private millers are represented by about 60 mills that, combined, process up to 2 million metric tons of wheat annually. As a rule, they are much smaller than the state-owned mills, but arguably much more efficient. Private mills specialize in processing imported Kazakh hard wheat and therefore can sell flour at higher prices than their state-owned counterparts. They are also equipped with newer equipment and can produce a wider range of wheat products suitable for different needs and tastes.

Policy Options

Wheat and bread play a significant role in the daily dietary and consumption needs of Uzbek households. It is one of the most challenging tasks to get the balance right for all stakeholders involved to make wheat policy work. Wheat production is seasonal and bread is in high demand. The current state procurement policy is not sustainable and a set of policy options are proposed to make the wheat sector more productive:

1. Abolish the state procurement system and privatize the state-owned mills and bakeries

The abolishment of the rigid state procurement system would allow farmers to get a fair price for their products and cultivate agricultural crops of their choice. But this policy option assumes that price of wheat products the state-owned mills and bakeries produce would be set according to the demand and supply in the market. This in turn raises the issue of compensation for low-income households and the consequences of a price increase for the most important staple food, wheat. Compensation in the form of additional cash benefits to the vulnerable would put a burden on the state budget, but its distortionary effect would be much lower than the subsidies that keep the prices low for every consumer and thus give perverse incentives to the market participants. The government should always target households that are below the national poverty line instead of providing blanket subsidies of all consumers at the expense of farmers or state budget.

2. Introduce a number of changes that would significantly improve efficiency of wheat production and consumption without abolishing the state procurement for wheat

This option would include abandoning the current rigid practice of setting the land areas that must be allocated to wheat. Under this option, state procurement contracts should specify only the quantities of wheat that farmers have to sell to the government, without specifying the area of land to be reserved for these crops. If farmers were given the opportunity to

optimize the cropping pattern (the "freedom to farm" principle), they would have greater incentive to produce the prescribed quantities of cotton and wheat for government procurement on less arable land. As a result, significant areas of land would be released for other crops, such as vegetables and feed crops. These changes would raise farmers' income and improve the well-being of the rural population whose livelihoods depend on agriculture.

3. Help farmers diversify their income sources from various crops and assist households to diversify their nutritional intake

Diversifying dietary intake from only bread to include, for example, fruits and vegetables would make diets healthier and put less pressure on high-demand wheat products. Farmers would also be incentivized to grow more fruits and vegetables (cash crops). This diversification and farmer education could be achieved through investing in the Council of Farmers to improve the quality of wheat and other crops grown in Uzbekistan. The introduction of intensive technologies and the integration of specific agricultural knowledge to production would help farmers boost their output and help them export to neighboring countries such as Afghanistan, China, Kazakhstan, Russia, and Turkey. The government could help the Council to invest in upgrading soil quality and addressing salinization and help farmers better prepare for challenges brought about by climate change. Climate change will bring warmer temperatures and lower precipitation in summer—the most important vegetation period for many crops. The government should work together with the international community—such as the World Bank, the FAO,

the International Center for Agriculture Research in the Dry Areas (ICARDA), and the International Food Policy Research Institute (IFPRI)—to share and exchange know-how to have better policy instruments for climate change adaptation.

4. Build and maintain a national statistical capacity to collect timely and reliable statistics on crop production, trade, and consumption, including wheat

Currently the national statistics on wheat do not match the statistics provided by the international organizations. There is divergence in final numbers and methodology used for wheat data collection. Accurate farm-level statistics would help both policy makers and farmers to see a clear general picture of the agricultural sector and help researchers generate evidence to inform policy making. The quality of policy options highly depends on the quality of farm-level data collected. Unreliable or lacking statistics may lead to bad science and bad policy making in the long-run.

Assignment

Your task is to compare the different policy options from the viewpoint of a welfare analysis for different stakeholders (farmers, consumers, millers, and government agencies) and help policy makers choose the best policies for the wheat sector in the long run. You can also use a cost-benefit analysis approach to better understand the economic, social, environmental, and food security implications behind those policies.

Policy Recommendations

Wheat (and wheat products such as flour and bread) production, consumption, and trade in Uzbekistan are severely distorted. The distortions are introduced by the government through state order and the state procurement system, consumption subsidies for bread and domestic wheat, and a highly regulated trade regime. Removal of these distortions would undoubtedly improve the allocation efficiency of resources; improve incentive mechanisms for producers, processors, and traders; and correct bias against the consumption of low-nutrition and high-gluten bread and other products.

In terms of agricultural policy, we emphasize the importance of diversifying agricultural production and adjusting the current wheat-dominated production policy. Given the low yields per hectare, poor quality, and marginal nutritional value of the wheat produced in Uzbekistan, reducing its predominance in crop cultivation would result in more competitive produce on the international market and enhance efficiency in production. Furthermore, farmers grow wheat on irrigated land, which reduces their marginal return and, moreover, wastes valuable water resources.

From a welfare point of view, the government should abolish excessive universal consumption subsidies and implement targeted aid similar to the food stamp programs implemented in various countries. From a political economy perspective, it is also essential to maintain food reserves and create monetary reserves in order to provide a buffer against sudden supply shocks.

Despite its declared self-sufficiency in wheat, Uzbekistan has remained a big importer of wheat and flour from Kazakhstan and Russia. An overall assessment of the wheat self-sufficiency policy is not clear-cut and its success should be judged in connection with the economic, political, and social costs of the policy. For example, expanding wheat cultivation has greatly reduced the area devoted to other grains and fodder crops. Coupled with this, the policy may have negatively affected the supply to market of other food and fodder crops, with consequences for the population's diet and nutrition.

Through the state procurement system and state-owned mills, the government can maintain very low prices for domestic bread (grey loaf). The price of bread and other wheat products is regulated by the government: price changes are infrequent and uniform all over the country. This means that the burden of subsidies is mainly born by farmers.

Subsidized consumption of bread and other wheat products has led to large inefficiencies. Though the subsidization is intended to serve the poor, because of the universality of subsidization, other segments of the population in addition to the poor would benefit from subsidies. Therefore a considerable portion of the benefits accrued from low prices for domestic flour and bread would be accrued by people who can afford a real market price for bread and flour. The burden of subsidies falls on the commercial farmers and their workers. Considering that, among those employed in agriculture, the poverty rate is higher than the average across the country, one could assume that, owing to low state procurement prices in the country, subsidies result in losses to grain producers, rather than improving food availability for the poor.

The decrease in farmers' incomes and the decrease of investment in agriculture over the long term may lead to food insufficiency, instead of providing the population with affordable bread and wheat flour. State procurement for wheat in Uzbekistan has acted as an indirect tax on farmers and their employees. Intended as a populist measure, the bread subsidies did not help to protect the poor population. Instead of universal subsidies, programs targeting poor and vulnerable households would have better protected the poor, distorted incentives for farmers less, and been more cost-effective in the long run.

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National Food Pricing Policy in Tajikistan

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Executive Summary

A major development objective for Tajikistan is to ensure nationwide food security and affordability for all social groups so that the entire population can meet healthy nutrition and food consumption standards.[1]

To ensure food security in the country, a number of **issues** have to be addressed. These include the country's heavy dependence on imports; inconsistency between quantitative and qualitative indicators of per capita food consumption and healthy nutrition standards; the low purchasing power of population coupled with seemingly unending growth in prices for food as well as non-food goods and services. Some populations cannot afford to purchase food and there is also an issue with the quality of available food; domestic production of food is insufficient and unstable; the Tajik consumer sector faces high inflation rates; and wholesale markets, management information systems, and other essential elements of market infrastructure are immature. Neither sale prices for products nor their actual production costs perform their regulatory function in the pricing process.

In recent years, prices for staple foods have risen so much that some populations and vulnerable groups cannot afford them. According to a Food and Agriculture Organization (FAO) study, in 2012 Tajikistan's undernutrition prevalence was 35 percent and the share of people living in poverty was 4.7 percent (FAO 2017, p. 7). The domestic food market is facing significant price growth because retail prices (i.e., consumer prices) are many times higher than respective producer prices and production costs of the products. This is the result of actions taken by various intermediary groups, profiteers, monopolists, and oligopolists; such price rocketing also occurs during various international and national holidays when the demand for certain essential goods soars. It should be pointed out that consumer prices for food products are growing much faster than consumers' incomes.

To stabilize the situation, it is necessary to take **coherent measures**. Among these are the development and adoption of a long-term government food price support strategy, which could keep prices at an optimal level; a national food security program for the period up to 2030; a program of food aid for the poorest; a roadmap for the development of regional agricultural clusters; and an improved mechanism for providing credits and benefits to agricultural producers as well as improved monitoring of prices and food security indicators. According to the FAO definition, "food security is achieved when all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life" (FAO 2012). This definition is integrally linked with the four dimensions of food security: availability, access, consumption, and stability. The government plays an important role in ensuring physical access to and affordability of safe food for the population of the country.

Key stakeholders include urban and rural populations of the country; agricultural producers; and a number of government agencies: the Ministry of Agriculture, the Ministry of Economic Development and Trade, the Ministry of Finance, the Agency on State Stockpiles, the Agency on Procurement of Goods, Works and Services, and the Tax Committee.

The main aim of this case study is to identify policy options to address food pricing in Tajikistan to secure access to food for households.

[1] The phrase *healthy nutrition standards* refers to intake rates for specific foods currently used by the Presidential Statistics Agency of the Republic of Tajikistan for purposes of national household and food security surveys. See http://www.stat.tj/ru/img/ed6443ece0ac0332e9a7d02e8078f549_1508578838.pdf

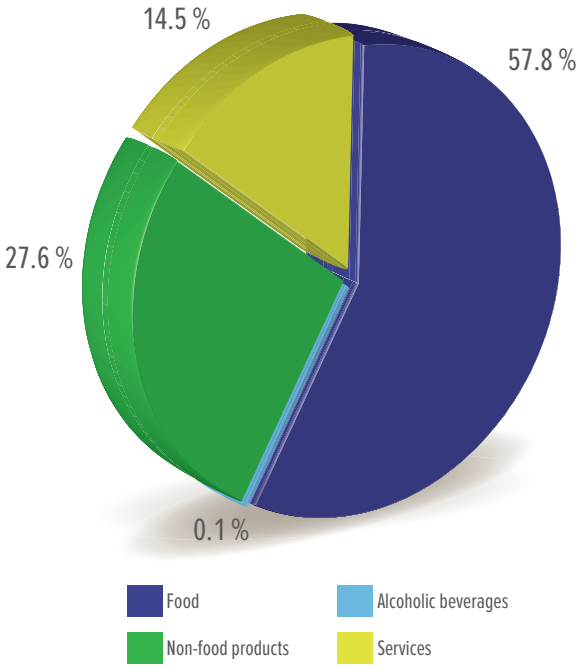
Background

The Importance of Agriculture

Food security in the country directly depends on the efficient and sustainable development of agriculture. Agriculture is a backbone sector as an employer of a majority of the population and a vital source of food and income for agricultural households. It contributes 20.7 percent to the country's gross domestic product (GDP) and 64.5 percent of total employment (Agency on Statistics 2017a, p. 15; 2017f, p. 86). The country's relatively remote and landlocked location, the poor integration of its roads and railways in the existing international transportation infrastructure, and its mountainous terrain all contribute to its unfavorable economic and geographic situation.

Over the past five years, the average annual growth rate of Tajikistan's domestic gross agricultural output has been 4 percent. Most agricultural products are cultivated in *dekhan* farms and household farms.[2] In 2016, community farms, *dekhan* farms, and household farms accounted, respectively, for 5.2 percent, 34.1 percent, and 60.7 percent of total agricultural output. Agriculture remains heavily dependent on support from the government.

Figure 1: Breakdown of Household Consumer Spending



Source: Authors' calculations based on data from Agency on Statistics 2016d; 2016b, pp. 105–06.

Consumption Level

Affordability of food is a critical criterion of food security. Taking into account high inflation rates, qualitative and quantitative indicators of actual food consumption are, to a great extent, determined by purchasing power. Low purchasing power of a large share of the population (around 31 percent of the population live in poverty) has a serious impact on consumption. In Tajikistan, earnings from employment comprise the largest share of household income: in 2016, this was 46.7 percent; income from household farming (earnings from the sale of agricultural products) amounted to 12.5 percent; pensions, benefits, and scholarship allowances made up around 6.3 percent; compensation payments, including charity support, accounted for 1.3 percent; income from the use of property and the sale of real estate was 0.3 percent; and other proceeds contributed 32.9 percent (Agency on Statistics 2017d). The share of household spending on food products is over 57 percent (Figure 1).

Consumer prices for food have been increasing faster than consumer incomes. This impairs urban dwellers' ability to meet healthy nutrition standards but benefits rural consumers. Rural food producers consume part of their own food products and sell the rest in the market. Agrarian inflation is particularly detrimental for city consumption. At the same time, increases in prices for such food products as flour, sugar, and tea affect both urban and rural populations because the country is directly dependent on imports for these products.

[2] A *dekhan* farm is a term for an individual or family farm in Central Asia.

Significant shifts have been observed in consumption patterns. Bread products currently account for a large share of consumed food (28.7 percent), which is 2.2 times larger than the share recommended in the healthy nutrition standard; potatoes, vegetables, and fruit account for 25.4 percent; meat and meat products for 18.2 percent (1.9 times less than required by the healthy nutrition standard); and dairy products for 7.9 percent (1.9 times less than required by the healthy nutrition standard).

In July of 2017, the food component of the Tajik consumer basket was worth 198.46 Tajik somoni, while the cost of a healthy diet is 383.24 Tajik somoni (almost two times higher). Thus the actual consumption of staple foods fails to comply with the healthy nutrition standards (Table 1).

It should be also noted that food consumption varies by decile. In 2016, among the richest 10 percent of the population, the average per capita potato consumption was higher by 46.2 percent than among the poorest 10 percent; the richest consumed 3.1 times more meat and meat products, 2.3 times more eggs, and 2.6 times more fruit. In 2010 and 2016, the differences between the richest and the poorest in the consumption of meat and meat products were, respectively, 2.8 and 3.1 times; in the consumption of dairy products, they were 2.1 times in 2010 and 1.5 times in 2016; and in eggs, they were 3.0 times in 2010 and 2.3 times in 2016 (Agency on Statistics 2016b, p. 109).

Dependency on Imports

Currently, despite positive changes in Tajik agribusiness and a steady increase in average per capita production of staple foods, the dependency of the domestic food market on imports persists and has been steadily increasing. A large portion of food products is imported. Domestic production of meat and meat products satisfies only 22.1 percent of the country's needs; domestically produced milk and milk products (in milk equivalent) meets 41.6 percent of its needs (Agency on Statistics 2016b, pp. 100–09; 2017a).

In recent years, per capita food output has been steadily growing, but high annual population growth

Table 1: Food Consumption in Tajikistan

	Actual consumption						2016	
Annual per capita consumption	1991	2000	2005	2010	2015	2016	Percent of the 1991 level	Percent of consumption based on healthy nutrition standards
Bread products (kg per capita)	155.1	148.0	154.9	159.1	150	151.4	97.6	116.5
Potatoes (kg per capita)	33.2	37.8	32.2	35.6	35.8	39.4	118.7	85.7
Vegetables, gourds, and melons (kg per capita)	94.2	98.5	79.4	84.7	80.0	80.4	85.4	56.6
Milk and dairy products (kg per capita)	171.0	64.9	48.2	61.0	57.5	59.5	34.8	23.7
Meat and meat products (kg per capita)	26.1	4.4	8.3	11.0	14.6	14.8	56.7	24.7
Vegetable oil (kg per capita)	13.3	10.2	12.4	14.4	15.7	17.2	129.3	143.3
Eggs (the number of eggs)	88	19	24	40	72	72	81.8	43.6
Sugar and confectionery products (kg per capita)	12.6	6.7	11.0	12.0	13.7	14.3	113.5	43.3
Fish and fish products (kg per capita)	3.0	0.3	0.3	0.4	0.4	0.5	16.7	4.2
Fruit, berries, and grapes (kg per capita)	31.9	50.8	38.4	33.3	35.9	30.4	95.3	39.0

Source: Agency on Statistics 2016a, p. 129; 2016b, p. 109.

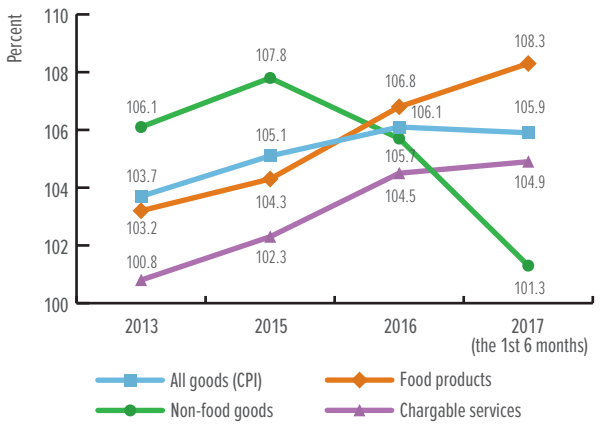
rates (of 2.0 percent) mean that the country relies on food imports to meet domestic demand for some products (sugar, tea, wheat, meat, and fish). Thus food imports have been steadily increasing, reaching US$651.2 million in 2016. Compared with food imports in 2000 (US$68.4 million) and 2008 (US$418.0 million), imports have increased 9.5 times and 1.6 times, respectively. The share of food in the total value of imported consumer goods rose from 11.5 percent in 2005 to 21.5 percent in 2016 (Agency on Statistics 2017c, p. 10).

The share of imported food in total imports has also increased—from 4.9 times in 2015 to 6.0 times in 2016. The share of agricultural exports in total exports was only 4.4 percent in 2014 and 4.7 percent in 2015 (Agency on Statistics 2016c, p. 10). In 2015, imports of agricultural products exceeded their exports by 13.7 times, and 14.6 times in 2014 (Karimova 2017).

Basic food imports include wheat and flour (which have the largest share); sugar, vegetable oil, vegetables, fruits, potatoes, food made of wheat (pasta, noodles, elbow macaroni, bread, fancy cakes, biscuits), milk products, and eggs. Tajikistan is not able to meet its needs for cereals and flour through domestic production. Kazakhstan and Russia are the country's major suppliers of wheat and flour. Around 1 million metric tons of cereals (including flour) were imported in 2015; wheat and wheat flour comprised 56.1 percent of total exports. In 2015 Tajikistan increased its imports of wheat and reduced imports of flour because of higher domestic wheat production.

The country's heavy dependency on the imports of some agricultural products is detrimental to national interests because it puts more pressure on the country's hard currency reserves. Such factors as the insufficiency of domestic outputs and substantial dependency on food imports and raw materials, among others, push up prices for staple foods and have an impact on the inflation rate in the consumer sector—this was 5.1 percent in 2015 and increased to 6.1 percent in 2016.

Figure 2: Consumer Price Index: Change over Time, December to December, 2013–17



Source: Agency on Statistics 2017c; 2017d, p. 203.

Price Disparity

Reducing the price disparity between agricultural products and manufactured goods is a crucial task. How and to what extent this task will be addressed will ultimately define the status of food security at the individual and national level.

In the aggregate consumer price index, indices of food prices remain relatively high. Of late, the most significant rises in prices for consumer goods have been observed in prices for food products. In 2016, the consumer price index was 106.1 percent, with the price indices for foods, non-food goods, and services at 106.8 percent, 105.7 percent, and 104.5 percent, respectively. In 2015 and 2016, the food price index grew steadily: from 103.2 percent in 2013 up to 106.8 percent in 2016. After the first six months of 2017, the food price index reached 108.3 percent (Figure 2). This translates to a substantial rise in consumer prices for food products in the country.

Over the course of the recent decade, prices for food products have increased considerably: 3–4 times for beef, poultry, dairy products, and flour, among other products (Figure 3). In addition, the country is facing

a significant divergence between producer prices (i.e., farmers' sale prices) and consumer prices for foods. For example, the end consumer price for potatoes in the first quarter of 2016 was 2.3 times higher than the producer price (i.e., the price paid to the farmer) (Figure 4). Although compared with prices in previous years, the divergence between producer and consumer prices has decreased, it remains vast.

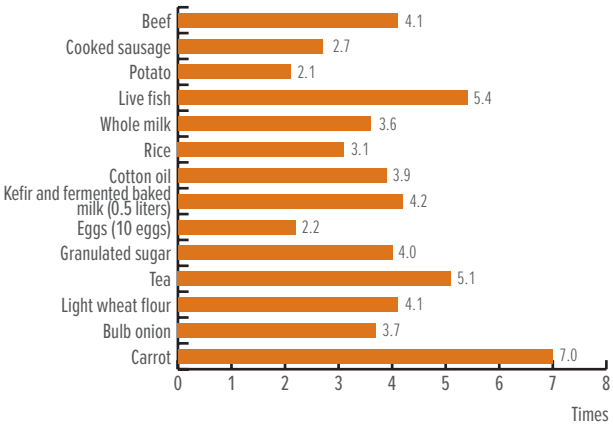
Consumer prices have been growing because of factors such as:

- ✓ Insufficient domestic production
- ✓ Fraudulent actions on the part of intermediary groups and profiteers
- ✓ Poorly developed transport and trade infrastructure, especially in some regions of the country
- ✓ Increased prices for the transportation of products, primarily because of regularly increasing prices of fuel (gasoline), because products are transported from one region to another primarily by road
- ✓ Lack of up-to-date storage facilities, warehouses, and facilities for accepting and processing perishable agricultural products
- ✓ Poorly developed system of government intervention in markets
- ✓ Impact of changes in demand and supply on the volume of agricultural production
- ✓ Increased costs of renting space in big central markets, taxes, and other payments to be made by retailers

For example, the wholesale price for potatoes was 0.80 Tajik somoni per kilogram. Potatoes are cultivated primarily in mountainous areas such as the districts of Jirgatol, Mastchoh, Divashtich, and Panjakent. These areas are located 200 to 350 kilometers from Dushanbe and 50 to 450 kilometers from regional centers. The cost of transporting potatoes to end consumers ranges from 0.20 to 0.40 Tajik somoni per kilogram. Potatoes are transported by truck from the northern areas via the only road from the northern region to the capital of the country; this is a toll road with no alternative routes.

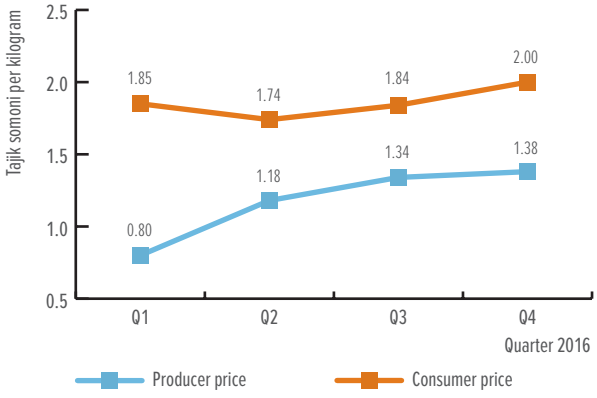
Thus the transportation of the farmer's produce from the field to the consumer significantly increases its price. Against this background of growing consumer prices, farmers' prices tend to grow too, but not as

Figure 3: Growth of Prices for Key Food Products, 2005–16



Source: Agency on Statistics 2017c, pp. 77, 78.

Figure 4: Potato Prices, 2016



Source: Agency on Statistics 2016b, pp. 99–100.

quickly. Retail prices grow much faster, but the bulk of the gains do not reach the farmers because it is captured by other players: retailers, resellers/intermediaries. As a result, neither consumers nor producers benefit from this price increase: both urban people and farmers lose. Such a situation damages the financial and economic performance and operations of agricultural producers in Tajikistan.

Prices are also growing because of the devaluation of the national currency and Russian ruble; the outflow of individuals' deposits from banks (three Tajik banks—Agroinvestbank, Tochiksobirotbank, and Tochprombank have become insolvent and are almost bankrupt so customers are withdrawing their funds); and the abrupt reduction of proceeds from labor migrants' remittances, which had been the main source of the country's budget revenues (their share in GDP was over 40 percent). Therefore it is critically important to reduce inflationary processes in the consumer sector and its food component.

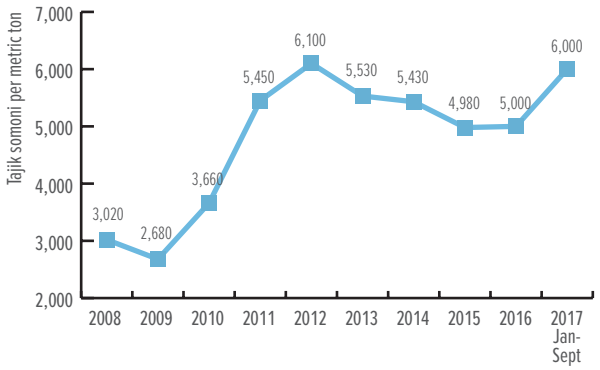
Tajik agribusiness is technically and technologically significantly lagging behind not only European countries but also some former USSR republics. In the first six months of 2017, more than 25 percent of agricultural machinery was in a state of disrepair (Agency for Statistics 2017d, p. 161). The degree of depreciation of production equipment and facilities is so high that the share of modern machinery and technology is very small, which adversely affects the sustainability of agricultural production. Agricultural producers have to use old, outdated machinery and the share of manual labor has sharply increased.

Because of the growth of prices of manufactured goods, electricity, fuel and lubricants, pesticides, spare parts, and mineral fertilizers (which are mostly imported), coupled with lowered rates of the national currency relative to the hard currencies, these goods became unaffordable for agricultural producers. At the same time, the producers' share of expenses for these goods in the production cost of agricultural products is quite high.

Between 2005 and 2016, the price of gasoline included in the fuels and lubricants product group increased 2.3 times. To buy a liter of gasoline, producers have to sell more than 2.5 kilograms of potatoes. In terms of specific price ratios of basic types of agricultural products and inputs, the situation has deteriorated. For agricultural machinery, because of price disparity, the situation is that in order to purchase the same category of machinery, increasingly more agricultural products have to be sold. Prices of gasoline, diesel fuel, mineral fertilizers, and other necessary products keep rising, creating problems for agricultural companies across the country (Figure 5). Electricity consumption in agriculture has been dropping mostly because the number of machines and tractors has decreased, the technical equipment use rate in the country's farms has fallen, and prices for electricity and compound feed have increased.

During the same period, farmers' prices grew at slower rates. Reducing the disparity between industrial and agricultural prices would improve the situation. It would be appropriate to contain the growth of prices at the stage between the farmers' price and consumers' price rather than to contain the growth of farmers' prices. It is support of farmers' prices that could provide a solid foundation for increasing agricultural outputs, modernizing production processes,

Figure 5: Average Prices for Diesel Fuel, 2008–17



Source: Agency on Statistics 2017c, p. 80.

and encouraging producers to offer competitive products. Mitigating these accumulated problems would have a positive effect on both structural reforms in agriculture and effective national policies. The involvement of public-private partnerships would also help in this regard.

Policy Issues

Inadequate governmental regulation of the food market, disproportionality between domestic supply and demand, food-related foreign trade transactions, insufficient protection of the domestic food market of some essential products that can be produced domestically, a lack of needed logistics infrastructure and modern storage facilities with refrigerators, energy price growth, poorly developed system of intervention buying, and operation of intermediaries and profiteers—all these factors have been contributing to the price growth of most products.

Meeting Demand

Domestic production of some food products does not satisfy demand. For example, annual domestic demand for meat products, based on the dietary intake levels (60 kilograms per year per capita) is 528,000 metric tons, the demand for dairy products (251 kilograms per year) is 2,208,800 metric tons, the demand for eggs (165 eggs per capita) is 1,452 million eggs, and 404,800 metric tons for potatoes. Domestic supply covers 22.1 percent of the demand for meat products, based on the healthy nutrition level, 41.6 percent of the demand for dairy products, and 23.2 percent of the demand for eggs (Agency on Statistics 2016a, 2016b).

It is necessary to revitalize animal husbandry and crop farming by identifying untapped opportunities in development of *dekhan* farms and other types of farms and by clarifying their new role, which is to meet basic food needs of the population, primarily by offering local products. This effort should be aimed toward a more efficient use of the country's natural diversity, taking into account local conditions. The Ministry of Agriculture, together with the Ministry of Economic Development and Trade, has prepared a comprehensive program for animal husbandry development. This program is now undergoing approval by these ministries; when implemented, it will help increase animal husbandry output, reduce prices in the consumer market, and improve food availability for the population.

Current production does not fully meet the needs of the country's population. The task is to provide support to domestic production and substantially reduce the share of food imports in the domestic market. For example, every year Tajikistan imports US$50 million worth of food oil, though this shortage could be easily eliminated by creating and expanding the production of cotton, sunflower, linseed oil, safflower oil and other types of vegetable oil. It is not advisable to pursue self-sufficiency in wheat, because agroclimatic conditions in Tajikistan are not good for its cropping. However, irrigated lands have been diverted for growing wheat in the country, which will lead to higher production costs of domestic wheat compared with the price of wheat imported from Kazakhstan, which is characterized by low production cost and high gluten content. The country could instead produce more potatoes, maize, rice, soy beans, dried fruits, fish and fish products.

Government Actions

During Tajikistan's transition to the market economy, agriculture (as the main supplier of food for the country's population and a sector with a limited capacity to compete) loses in the inter- and intra-sectoral competition and becomes a sort of donor for better organized and monopolized related sectors. In the agricultural sector, price liberalization without price regulation and without competition benefits the

related sectors—primarily those standing between food producers and end consumers. This situation could be analyzed by using Porter's Five Forces Framework—an analytical tool that shows how competitive environments could be improved under the influence five forces: the intensity of rivalry, the entry of new players, the bargaining power of consumers, the bargaining power of suppliers, and the emergence of product substitutes.

Porter's Framework could be adapted to the specifics of the agricultural sector by introducing a sixth force: the government. In present-day Tajikistan, government and its policies could act as this sixth force by changing the intensity of rivalry and optimizing food prices.

The government has been attempting to strengthen food security and reduce the impact of globalization and global financial crises. Despite a number of measures that have been adopted, the legislative framework of the country in support of creation and operation of the food market is still evolving. Over the last several years the following programs and laws have been adopted:

- ✓ The Food Security Program of the Republic of Tajikistan up to 2015 (Resolution of the RT Government No. 72, dated February 2, 2009)
- ✓ The law "On Food Security," which sets forth main guidelines of state policy on food security perceived as an integral part of the security of the state
- ✓ The Program for Agricultural Reforms for 2012–2020 (Resolution of the RT Government No. 83, dated August 1, 2012)
- ✓ New law "On Dekhan Farms" (Resolution of the RT Government No. 1289, dated March 15, 2016)[3]

In addition, the following sector-specific development programs have been adopted and are being implemented:

- ✓ The Program for Development of Sericulture and Processing of Mulberry Silkworm Cocoons for 2009–2020 (Resolution of the RT Government No. 409, dated August 30, 2011)
- ✓ The Program for Development of Animal Biotechnologies for 2013–2017 (Resolution of the RT Government No. 384, dated August 1, 2012)
- ✓ The State Program for Developing New Irrigated Lands and Reclaiming Lands Previously Taken out of Commission for 2012–2020 (Resolution of the RT Government No. 450, dated August 31, 2012)
- ✓ The Program for Organization and Rehabilitation of Refrigerators and Refrigerated Storage Rooms for Storing Agricultural Products for 2015–2019 (Resolution of the RT Government No. 727, dated December 1, 2014)
- ✓ The Program for Pasture Development for 2016–2020 (Resolution of the RT Government No. 724, dated November 28, 2015)
- ✓ The Program for Development of the Breeding Stock Sector and Pure Breeding for 2016–2020 (Resolution of the RT Government No. 792, dated December 30, 2015)
- ✓ The Program for Horticulture and Viniculture Development for 2016–2020 (Resolution of the RT Government No. 793, dated December 30, 2015)
- ✓ The Program for Seed Farming Development for 2016–2020 (Resolution of the RT Government No. 438, dated October 28, 2016)

[3] The official website of the National Legislation Center under the President of the Republic of Tajikistan is http://mmk.tj/ru/legislation/legislation-base/

However, the measures adopted do not provide full protection for food producers and consumers. They are fragmented and characterized by poor coordination among ministries and the lack of a common development strategy. To implement a comprehensive approach to food market development in the country, a package of consistent regulatory and legal acts, based on forecasting horizons and state regulation of the country's food sector, is needed. This comprehensive package should be linked to the *National Development Strategy of the Republic of Tajikistan for the Period up to 2030*.

Household Spending

The informal market accounts for the biggest share of retail food sales. The share of consumer cooperatives overall is insignificant (less than 2 percent). Trading margins for foods are high. Resellers set rather high trade markups (45–50 percent), making food less affordable for a large share of the population. Any deflection of the price from its market equilibrium will have an impact on the composition and volume of consumption, spending, living standards, subsistence, and the household consumer budget.

Household spending on food is increasing much faster than the quantity of agricultural outputs. The population of the country spends a lot of money on agricultural products, but profits from sales earned by agricultural producers are limited.

In Tajikistan, household spending on food includes a huge amount of money paid to sellers in cash. The aggregate value of these funds substantially exceeds the cost of agricultural products. This difference has been increasing more rapidly than the growth of agricultural production. In fact, it turns out that the country's population spends large amounts of money on food, while the farmers' portion is much less. Agricultural processing companies and retail trade companies earn most of their profits from the sale of agricultural products to the population. Therefore the task of state price regulation should be to increase the share of agricultural producers' profit in food prices, and this task should be viewed as a priority. Antimonopoly, tax, and customs measures will be more efficient than fiscal measures, because these are the measures that really influence the restructuring of the price system.

Stakeholder Groups

Tajikistan's Population

The population of Tajikistan is around 8.8 million (as of January 1, 2017), with 73.6 percent living in rural areas, and an annual growth rate of 2.4 percent (Agency on Statistics 2016a, p. 23). The poverty rate in 2016 amounted to 30.3 percent, falling from 53 percent in 2007. The extreme poverty rate dropped from 20 percent in 2012 to 14.0 percent in 2016. Over the period of steady economic growth, the Human Development Index ranking for Tajikistan increased on average by 1.07 percent every year. Out of 188 countries included in the Human Development Index, Tajikistan was ranked 129th in 2017. The need to improve the population's diet is a persistent issue. Chronic undernourishment affects 26 percent of population, while 10 percent of children under five suffer from severe malnutrition. The economic burden of undernutrition in Tajikistan is substantial and is estimated at 41 million US dollars. In the Global Food Security Index 2016, the country was rated 88 in the list of 109 countries (EIU 2016).

The urban population accounts for 26.4 percent of the total population of the country (Agency on Statistics 2016a, p. 27). Urban dwellers want to lower and stabilize prices for agricultural products because this would enable them to buy more food products. Differences in the structure of food consumption in urban and rural areas must also be taken into account. For example, urban people consume more eggs (by 40 percent), fish products (by 33.3 percent),

and meat products (by 22.4 percent) than rural populations.

The rural population accounts for 73.6 percent of the total population. A growth in the price of food increases their revenues. At the same time, it is necessary to prevent significant differences between producer prices and retail prices because a large difference does not benefit either producers or consumers, especially urban consumers.

Agricultural Producers

The country has 131 associations and 4,674 collective and 14,507 individual *dekhan* farms, which together account for 99.3 percent of total number of agricultural enterprises. In accordance with national legislation, producers have the right to set selling prices and determine cropping patterns themselves. Measures taken by the government price support program to support producers' prices in different seasons are expected to be welcomed by agricultural producers. Possible customs privileges and tax exemptions could be included in the government food security program; such measures would encourage producers to increase agricultural production and harvest.

Consumer Groups

Tajik consumer cooperatives operate on the basis of the law "On Consumer Cooperation in the Republic of Tajikistan." These cooperatives include three regional unions of consumer cooperatives in Sughd, Khatlon, and Gorno-Badakhshan Autonomous Oblast (GBAO), and 47 district consumer cooperatives. One of key tasks of consumer cooperatives is to procure and store agricultural products in order to limit price increases for staple agricultural products in the country's consumer market. Today Tajikistan has 73 markets with links to the Tajikpotrebsoyuz (Tajik Consumer Union); 16 of them specialize in livestock. All together, these markets have 3,154 outlets. The cooperatives purchase products for the country's food markets and agricultural raw materials from local sources. Procurement organizations sign contracts for growing and delivering products with *dekhan* farms and other producers, inform them about purchasing prices and about terms and conditions for the acceptance of products. Organizations purchase more than 15 types of agricultural products and raw materials. The average annual volume of procured agricultural products is 3,000 metric tons. To improve the supply of agricultural products to the cities, districts, and villages, 32 for-profit procurement agencies have been established. In 2016, with the aim of creating stockpiles and limiting spontaneous increases in prices of agricultural products in the country's consumer market, 4,660.5 metric tons of agricultural products were procured (primarily potatoes, onions, carrots, pumpkins, and similar foods).

Government Stakeholders

The Ministry of Economic Development and Trade is a central executive agency participating in development of state policy in all social and economic sectors of the country. It is tasked with the development and implementation of state policy; the regulation of analysis; and the development of roadmaps and short-, medium- and long-term strategies, among other responsibilities. Its key strategic document is the *National Development Strategy of the Republic of Tajikistan for the Period up to 2030*, which sets the goal of improving the population's living standards through sustainable economic development as the overarching goal of long-term development. To implement the strategy, the government has prepared the Mid-Term Development Program for 2016–2020, which proclaims the achievement of food security and access to adequate nutrition to be one of its tasks. The program's priority objectives are to address the low affordability of food and to improve food and nutrition security. Currently an interagency working group has been set up under

the Ministry of Economic Development and Trade to develop a new food security program.

The Ministry of Agriculture is a central executive agency responsible for the implementation of agricultural policy. The country adopted the law "On Food Security," which sets forth main guidelines of state policy toward achieving food security as an integral part of its security in accordance with recognized international principles and standards. The government also approved the Concept of Agricultural Policy and the Program for Agricultural Reforms for 2012–2020. The efforts of the Ministry of Agriculture are aimed at developing and implementing agricultural reforms in order to provide access to affordable food to the maximum extent possible.

The Ministry of Finance helps to implement a uniform state policy on the regulation of financial, fiscal, and tax activities; accounting and financial reporting (except for the banking system); and insurance, currency, and financial markets. It participates in the development of investment, pricing, monetary, currency, and other policies for which it is responsible. It prepares forecasts of fiscal, investment, and other macroeconomic indicators; develops proposals on priorities of budget financing of various sectors of economy; guides the development of the mid-term state budget and budgetary process; and supports the efficient day-to-day management of the country's budget funds.

The Agency on Public Procurement of Goods, Works and Services is an independent body engaged in the public procurement of goods and services. In Tajikistan, there are more than 6,000 purchasing organizations, including ministries; agencies; state committees and state enterprises; regional, city, and district administrations; hospitals; and schools.

The Agency on State Stockpiles is a central executive agency implementing state policy on state stockpiles. Its responsibilities include implementation of state policy on state stockpiles, protection of economic security of the country, and the development of methodological guidelines for the preparation and efficient management of stockpiles. To stabilize prices in the country's consumer market and in emergency situations (various natural disasters, flooding, earthquakes, etc.), a certain amount of funds is set aside in the annual budget to purchase and store food products (mostly, flour, sugar, tea, salt, potatoes, onion, carrot, vegetable oil, etc.).

The Tax Committee is a central executive agency responsible for tax collection and the implementation of tax legislation. It also develops tax administration mechanisms as well as controlling and overseeing the accuracy of tax assessment and ensures the payment of all taxes in a timely fashion.

Policy Options

1. To develop a long-term food price support strategy to keep optimal food prices

A food price support strategy to keep optimal food prices is needed to avoid or prevent monopolism of producers and rocketing prices for raw materials, fuel and energy, and essential goods. Developed countries' experience shows that prices are usually regulated primarily by proactively making an active impact on the generation of revenue by agricultural producers by setting guaranteed prices, loan rates, price limits, and quotas and by providing government subsidies. But free market prices remain definitive. So it can be concluded that the price should act as a means rather than an object of regulation by the government. The government might reimburse the losses incurred by agricultural producers as a result of deviations from market prices in amounts needed for their performance within a pre-set level of revenue. It would provide for the establishment of an optimal system for regular impact on market prices and enable the use of prices as a tool to make an impact on production, revenue, savings, and

investment. At the same time, such a strategy should create favorable environments for agricultural production and enhance the existing wholesale markets and information sources, including extension and technical services.

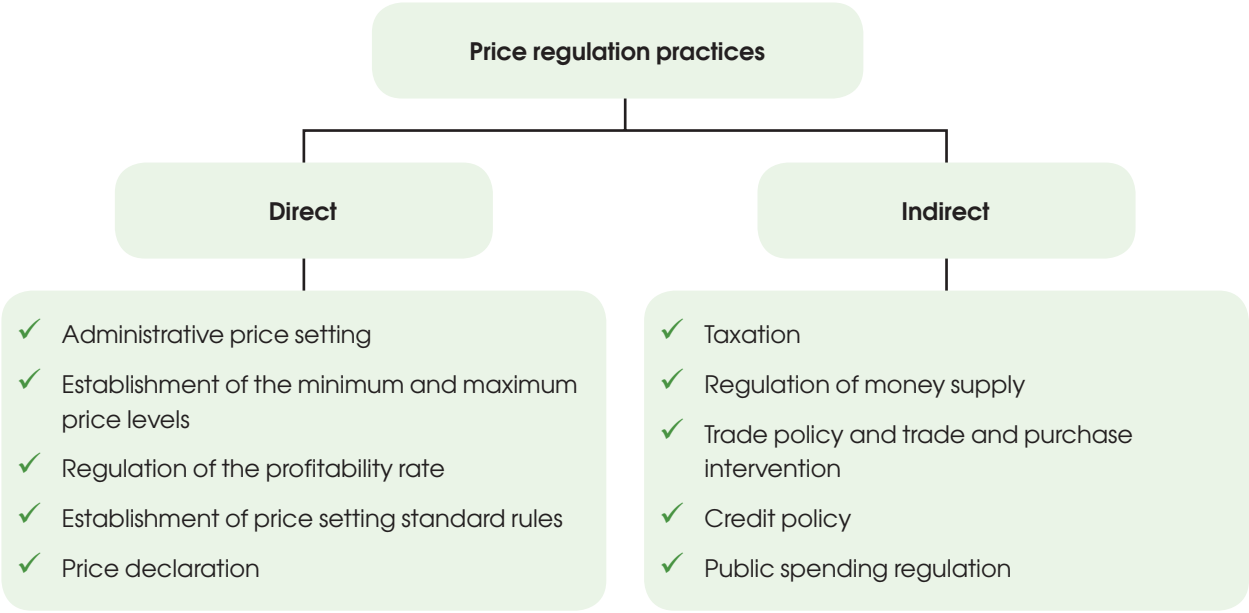
Pricing is a powerful lever for economic management, and the ways a government uses this lever define, to a great extent, the direction of reforms in a country. Advocates of regulated markets and advocates of self-regulated markets have disputes primarily about pricing systems, putting forward fairly well justified arguments in support of their theories. However, international experience shows that in the course of deepening market reforms, government regulation in the agricultural sector is an integral part of its successful performance. Countries such as Germany, Spain, Sweden, and the United States have used various interventions to support farmers during different periods of their development, including the regulation of prices for agricultural products. In developed countries, self-regulation of market-based production of agricultural products is coupled with effective economic management.

Having a long-term food price support strategy would help increase the effectiveness of government interventions aimed at balancing demand and supply of food products, as well as supporting an efficient food market infrastructure. The government's role would be to operate as an economic institution assigned to harmonize and align interactions of interests, proceeding from the interests of society as a whole and using both direct and indirect methods (Figure 6). National price regulation policy should be focused on the interests of agricultural producers. To this end, efficient interventions would include antimonopoly, tax, and customs measures because they have a tangible impact on restructuring the price system.

The government could develop coherent incentives for producers to encourage them to expand the scope of their agricultural products and increase their outputs. At the same time, it should take an active part in the implementation of activities aimed at improving the affordability of food for all social groups.

Many tools are available for governmental price support. These tools are also flexible, and may be

Figure 6: Price Regulation Practices



Source: Неъматов 2012 (in Russian).

switched on or enhanced depending on circumstances. They include, among other things, public procurement of agricultural products if there is a surplus and government market intervention in the case of deficits. Both these tools can support producers and stabilize prices.

In agriculture, the mechanism for changing and regulating prices operates differently than it does in other sectors because of the specifics of agriculture and the food market. **Three key components of price regulation** in the food market should be identified with a view to improving it: **demand regulation**, **supply regulation**, and r**egulation of the food market infrastructure**. Today the main focus is on regulation and support of food producers—that is, the supply side of the market. However, development and robustness of the food market depend just as much on demand, which can be encouraged, constrained, or balanced if it develops unevenly.

Demand regulation. Domestic food demand should be regulated to encourage demand and meet nutritional requirements. Measures stimulating demand will help ensure that all groups have an optimal, nutritionally adequate diet in order to maintain the nation's health. This aim could be achieved by increasing the income of the population, implementing activities to reduce and stabilize food prices by improving the quality control of food sold in the market, protecting consumer rights, and so on.

Supply regulation. Locally produced food supplies could be regulated by providing state guarantees to producers and investors and streamlining the institutional framework of the market, for example. Imports should be regulated with the aim of eliminating food shortages and protecting domestic producers by licensing importers, implementing technical and sanitary standardization and standards, and setting requirements for packaging and labeling food products.

Regulation of the food market infrastructure. The right balance between demand and supply should guide the regulation of the food market infrastructure. This balance could be achieved by developing a mechanism for wholesale and retail trade in manufactured goods; providing incentives for creating refrigerated rooms, storage facilities, and so on; regulating and improving the system of transporting manufactured goods; providing information and analytical support to producers and consumers in the market of manufactured goods; and improving the financial and credit system that provides services to the food market.

An important measure against the disparity of prices between agricultural and manufactured products could be to reduce prices for agricultural machinery and equipment by introducing customs privileges for imports of agricultural machinery and equipment.

Regulating the food market's institutional framework would help develop a competitive environment and, therefore, reduce prices of manufactured goods. In this connection, we believe that government efforts should be channeled toward creating an optimal mix of market participants of various organizational and legal forms and different forms of ownership. This would be a win-win situation for all stakeholders and the business environment would be much improved.

The existing informal wholesale markets are unable to efficiently transfer products from producers to consumers and processors. An important element of the food price support strategy could include establishing a wholesale food market to function as group of production, transportation, service, and trading enterprises of the country and major financial institutions. This wholesale market could purchase and sell agricultural products based on certain rules. At the same time, prices of agricultural products should provide maximum support to production and movement of food products from production to consumption places. The creation of such entities would help reinforce the production and sale processes.

A national program for developing infrastructure for wholesale markets could be prepared and implemented together with private companies.

"Guaranteed price." Drawing from experience gained by developed economies, it would be possible to introduce an intervention mechanism to enable the government to participate in setting and regulating prices for agricultural products by setting target, benchmark, or minimum prices that would guarantee a certain level of revenue for *dekhan* farms. The introduction of the "guaranteed price" tool would benefit many players in the market.

The current market price is defined by the difference between supply and demand prices at a given time. This price does not necessarily benefit agricultural producers. In some cases, it even fails to cover production costs. Governmental regulation implies a regulation of the income of Tajik farmers through a price mechanism rather than regulation of market prices.

Having a long-term food price support strategy would improve the overall performance of agricultural producers. For example, when prices for some products decrease significantly and the government buys the farmers' produce at higher prices, the farmers' income would remain stable or even increase. Thus agricultural producers would be the main beneficiaries of this intervention.

In addition, an efficient food price support strategy would benefit government agencies and consumer cooperatives because it will provide support for their activities. To limit activities of resellers and intermediaries in the domestic consumer market, the Stockpiling Agency, jointly with the Agency for Public Procurement of Goods, Works and Services and consumer cooperation societies, already work on containing the growth of prices for agricultural products. For example, contracts locking in the maximum possible retail mark-up for basic food products could be signed between producers and various distribution chains. In this case, the population would benefit from stable prices in the food market.

2. To develop a national long-term food security strategy

The development of a national long-term food security strategy would help to meet the goals and objectives identified by the Government of Tajikistan in such strategic documents as the *Millennium Development Objectives* and the *National Development Strategy of Tajikistan for the Period up to 2030*. The country's experience shows that the adoption and implementation of its Food Security Program for the period up to 2015 yielded good results, helping to alleviate food insecurity. Positive shifts were also observed in addressing such issues as food availability, its physical accessibility and affordability, and increased actual consumption.

The shortage of good-quality domestic food became very acute after the liberalization of prices—primarily, food prices—was quickly fixed through aggressive food importation that accounted for more than half of food consumption in Tajikistan and more than 60 percent in its capital city. In the course of reforms, the situation in agribusiness improved substantially; however, many institutional transformations remain incomplete because of a number of social and political constraints that led to a new surge in imports, including food imports.

Today it is increasingly obvious that agricultural market liberalization alone cannot address mounting issues in agriculture and that the food security of the country cannot be improved unless radical structural reforms are implemented. To improve the profitability of companies and increase yield per hectare, preferences should be given to growing such leguminous crops as beans and soy.

To supply food to the population of the capital city, industrial cities, and districts, beginning with live-

stock products (milk, meat, eggs), a considerable portion of cotton-growing farms in the suburbs could be converted into vegetable and dairy farms and inter-farm beef-fattening enterprises could be set up, among other structural modifications.

To satisfy the demand for sugar as fully as possible and reduce dependency on imports, the area planted with sugar beet could be increased. *Dekhan* farms could consider borrowing the funds to construct mini-sugar mills in the regions where sugar beet is cultivated.

The government could provide incentives for *dekhan* farms and agricultural processors to produce various preserved food products and market them for export. To achieve this, mini-packaging facilities should be built where agricultural products are grown. Agricultural output processing should become a priority in developing the regional economy. By supporting the development of small businesses and industrial entrepreneurs in rural areas, appropriate conditions could be created to set up mini-processing enterprises to process fruits and vegetables—especially tomatoes, cucumbers, various oil crops, meat, beans, and so on, which have comparative advantages and competitiveness in the Commonwealth of Independent States markets. To support the further development of farm cooperation, farmers should be trained on a large scale to build skills they need to organize efficient cooperation based on market conditions.

In the country's rural areas, individual entrepreneurship in production is underdeveloped. Only 5 to 8 percent of entrepreneurs are engaged in production. Unfortunately, individual entrepreneurs in the rural areas are involved only in retail trade, catering, and transportation services.

Based on the principle that the sector should develop competitive advantages, it is necessary to:

- ✓ Adjust the composition of agricultural subsectors to develop subsectors that have comparative advantages. Much attention should be paid to the subsectors related to the production of cereals, vegetable oils, vegetables, fruits, cotton, sugar beet, livestock products, and fish. Strengthen trade complementarity and supply more products of downstream and fine processing for export to avoid unnecessary competition.

- ✓ Provide incentives to private producers, state-owned enterprises, and enterprises with foreign capital in order to develop agricultural processing, including processing of cereals, animal meat and poultry, food freezing, and processing of oils and fats; produce high value added agricultural products; create jobs; and enhance competitiveness in the agricultural product market.

- ✓ Develop the processing capacity of special products: turn from exporting commodities and low value added products to exporting high value added products, set up supply depots oriented to processing, and increase the industrialization level of agricultural production and its efficiency.

- ✓ Focus on improving the skills and knowledge of the rural population by developing the capacity of the agricultural workforce to adopt new agricultural technologies and facilitate agricultural education.

- ✓ Create depots for processing agricultural products in the border areas; adjust the composition of agricultural production so that it includes key basic sectors and many new production sectors. Cereal production, animal husbandry, and fishery could be selected as basic sectors. The central role given to crop farming development would mean an increase in paddy fields for growing semiaquatic rice and areas planted with wheat, maize, and other crops so that the government can meet basic food needs of the nation. In animal husbandry and poultry farming,

such resources as grasslands should be used to the fullest extent; it is necessary to develop standardized farming of meat-type chicken, laying hens, meat cows, milk cows, and goats. Fish farms would help take advantage of country's water resources, create a new economic model, and develop shallow water fishery.

Both traditional and new agricultural sectors in Tajikistan should be further developed. Strengthening cotton production, as well as encouraging new production sectors such as gathering the fruit of wild plants, apiculture, horse breeding, sericulture, and growing citrus plants would contribute to Tajikistan's long-term food security. In addition, studies in seed breeding, genetics, cattle quality improvement, and chemical fertilizers and pesticides would be very helpful to the development of agriculture in the country.

Developing a national long-term food security strategy is expected to improve the competitive environment, expand distribution channels for competitive products, and support domestic agricultural producers. This policy option would be conducive to trade and transport infrastructure development by increasing the number of storage facilities for agricultural products, promoting innovative practices and products of market infrastructure in an integrated manner, and improving the framework of product marketing and delivery to the market as well as marketing arrangements/relations. Public authorities would benefit from signing direct contracts with distributor networks and agreements with producers, which would include activities to support prices for selected products.

A better-developed agricultural sector would meet the nation's food needs by supplying domestic products. It would also reduce food imports and support producers and consumers of agricultural products. Government institutions and people are keen to have the food security issue successfully addressed.

A national long-term food security strategy would build on the assurance of affordability of and access to foods for all social groups, environmental safety of foods, protection of consumer rights, and conservation of the natural environment. When implemented, it would help to increase the supply of domestic products to the internal market and reduce currency drain. Ensuring food security would be also good for people's health. Other benefits would include the creation of new jobs, greater processing capacities for agricultural products, and increased tax revenues to the national budget. Both the government and the population would benefit.

3. To develop a food aid program for the poorest households

Improved efficiency of agricultural production does not address the issue of food affordability for the entire population because more than a quarter of the country's population is poor. The foreword to the FAO publication *World Agriculture: Towards 2015–2030* emphasizes that, despite concerted efforts to halve the number of undernourished, this target is unlikely to be achieved by the target date (FAO 2003). The prevalence of the undernourished population in Tajikistan dropped from 36.5 percent in 2005 to 30.3 percent in 2015. Nonetheless, Tajikistan continues to be one of the hungriest nations in Central Asia.[4]

Food consumption among poor households is of particular concern. Significant demographic growth (on average, the population is growing by 2.2 percent per year) and lack of employment opportunities result in high poverty rates, especially in rural areas. This in turn limits access to food and nutrition. Affordability of food varies by social group and geographic area

[4] ASIA-Plus. 2016. Media Group/Tajikistan. October 16, 2016. http://news.tj/ru/news/tajikistan/economic/20151016/tadzhikistan-ostaetsya-samoi-golodnoi-stranoi-tsentralnoi-azii (in Russian).

by income levels. According to official statistics, in the poorest household decile, food consumption is significantly below healthy nutrition standards. Quantitative and qualitative parameters of food consumption have a wide-ranging impact. Therefore the development of a food aid program for specific social groups could help to improve actual food consumption rates, bringing them closer to the standards. Certainly both rural and urban populations are keen to have such a program in place. It would generate additional demand for goods supplied by *dekhan* farms and boost food consumption among the poorest in Tajikistan.

In spite of the positive development in poverty alleviation, it is poverty (i.e., the inability of some populations to pay) that continues to affect food security for the country's citizens. The distribution of consumer spending could be used as a criterion for determining poverty and a symptom of food insecurity. According to the Engel coefficient, in very poor households, food expenditures account for one-third of total spending; if food expenditures account for 50 percent of total spending, the poverty of the household is considered to be extreme. Most Tajik households spend a significant part of their income to buy food products, and it is therefore deemed critically important to mitigate inflation in the consumer sector and its food constituent.

The country is predominantly mountainous. Arable land occupies only 7 percent of its territory, and parcels of land for agriculture are distributed unevenly across the country. For this reason, there is a sharp regional disparity in the development of agricultural production and the availability of food. Land scarcity creates spots of social tension where mechanisms for satisfying basic necessities are either absent or not working; potentially, these mechanisms can be destructive and could become an impediment for sustainable development of the regional economy. This issue could be addressed by controlling and managing local disparity processes. Developing a food aid program for the poor could be the first step in this direction. It would help make food affordable in the most backward regions, defuse social contradictions, increase the income of *dekhan* farms, assist the supplying companies to sell their surplus products, and build the population's trust of the authorities.

The consumer cooperation sector and core government ministries would face the challenge of increasing food procurement in the market to distribute it among the poorest populations in the country. However, aid to the poorest is currently a prohibitively heavy burden for the Ministry of Finance and the Ministry of Economic Development and Trade because of a lack of financial resources. Government agencies would have to look for sources of finance for such a program.

The main advantage of this policy option rests with its focus on making the nation healthier by providing food aid to those who need it, strengthening the economy of the farming sector by improving the arrangements for its direct contacts with food consumers, raising public awareness of what constitutes healthy nutrition, and reducing social tension.

Socially vulnerable populations would benefit the most from this option because they would be able to improve their food and nutrition security as well as reduce the gap between the richest and the poorest 10 percent.

4. To improve the mechanism for providing credits, subsidies, and tax reductions to agricultural producers

Credit products offered by the National Bank and commercial banks of Tajikistan are not at all cheap—they have an average interest rate of 27 percent (the annual interest rate ranges from 24 percent to 40 percent). High credit risks compel a majority of commercial banks to enforce prudent credit policy. Despite that, a number of banks in the country have become bankrupt. The Agroinvestbank, which invests in Tajik agribusiness, has been on the verge of bankruptcy since 2015.

Today demand for credit is limited as a result of high interest rates and tightening requirements for collateral. The agricultural sector receives a small number of loans because the country's banks consider agriculture to be a high risk sector.

Agricultural producers need access to concessional short-term credit to purchase fuel, spare parts, and other inputs; repair agricultural machinery; buy mineral fertilizers, pesticides, fodder, veterinary drugs, and other inputs; hire seasonal workers; and purchase young agricultural animals and equipment. They also need investment loans with a maturity of up to five years to purchase agricultural specialized transport and machinery; establish perennial plantings and vineyards; reconstruct and modernize livestock farms and fodder production, storage facilities for vegetables and fruits, greenhouses, refrigerators, and so on.

A national system of harvest insurance also needs to be put in place to protect interests of *dekhan* farms, especially small farms during crises and natural disasters that trigger harvest losses.

Dekhan farmers are at risk of losing their livelihoods when confronted with crises beyond their control. To protect their interests—especially those of smaller, more vulnerable *dekhan* farms—during crises and natural disasters that trigger harvest losses, a national system of harvest insurance also needs to be put in place. A full discussion of the benefits of harvest insurance is out of the scope of this study, but more work is urgently needed in this area.

An agricultural credit bank could be established as a source of financial resources. Drawing from public finance, private investment, and various aid funds, it would possible to implement plans to develop supply chains of agricultural products to reduce their production and supply costs. Credit products offered by domestic banks and meant for agricultural and rural development should be made available on favorable terms and for long periods. The government should actively participate in lending to agricultural subsectors and provide incentives for commercial banks to encourage them to increase the share of agricultural concessional credits in the lending to the agricultural sector. For example, Germany extends concessional government credits to farmers with an interest rate of 1 percent for 28 years (Neshchadin 2009).

Agricultural output growth as well as reduction in food prices could be achieved by granting benefits (exemptions) and, possibly, by improving the credit vehicle for those agricultural producers who cannot afford to buy expensive fertilizers, pesticides and herbicides, agricultural machinery, and manufactured inputs.

Consumers would also benefit because the government agencies would enable them to buy relatively cheap products. Tax exemption and favorable credit terms could act as an incentive to increase the production of agricultural products and, consequently, would help to increase revenues and tax proceeds because the scales of production would expand. Consumers would be able to meet their needs for various food products.

Increased amounts of long-term credits would benefit agricultural producers in many ways. They would be able to establish new enterprises and make new agricultural production and processing capacities operational, among other advances. At its current stage of development, Tajik agriculture is in dire need of long-term credit.

5. To design a roadmap for developing regional agricultural clusters

In 2016 agricultural products were produced by 150,952 different agricultural entities, including 132 state-owned companies, 131 associations of *dekhan* farms, 159 joint stock companies, 4,674 collective *dekhan* farms, 749 household plots, and 145,107, individual *dekhan* farms. Because of the reorganiza-

tion of agricultural enterprises and the financial insolvency of a majority of these enterprises, the government system that had supplied chemical fertilizers, fuel, and agricultural machinery was abolished.

To enhance the efficiency of agricultural production, a roadmap for developing regional agricultural clusters needs to be prepared. First, clusters facilitate partnerships between the government, the economy, and scientific institutions. Second, clusters help organize the entire production process from design to primary production to sales in a single chain. Both of these elements contribute to developing cooperation, innovation, and increasing efficiency of the agricultural sector.

Establishing regional agricultural clusters could help minimize costs by eliminating intermediaries and reducing prices. An agricultural cluster could enable its participants to meet the requirements of a market that needs regular supplies of products and services produced by the cluster enterprises that meet quality requirements. It could benefit from economies of scale in purchasing inputs and production, minimize costs by eliminating intermediaries, support retraining of personnel, conduct market and logistics studies and technological research, enter new product markets through proactive marketing and innovation policy, and establish strong contacts with financial and credit institutions based on its cluster image.

This policy option would be expected to improve agribusiness competitiveness through effective cooperation and coordination at all stages of agricultural production. It would benefit the Ministry of Agriculture and the Ministry of Economic Development and Trade, as well as other government agencies responsible for the national agricultural policy implementation.

Tajikistan has significant capacity for establishing regional clusters in agriculture and food production. The development of potential agricultural clusters could be based on the roadmap of socially motivated protected small businesses that are equipped with highly effective mini-technology. Possible areas of focus might include measures to increase the production of canned fruit and vegetable products. It would be possible to launch activities that establish a regional cluster—for example, in wine-making and vine-growing, cattle leather processing, and horticulture (to produce apples, dried unpitted apricots, figs, and other dried fruit). The Tax Committee would benefit from an increase of the number of small enterprises, and, hence, from increased proceeds to the national treasury. This intervention would increase the supply of domestic goods to the internal market as well as the country's exports. The Ministry of Finance would have to find opportunities to give grants and provide credits to implement this policy option, which would result in future financial returns.

6. To improve mechanisms for price monitoring and food security indicators

The relevant Tajik state entities (especially the statistical agencies) should increase their coverage of regions and cities where prices for staple agricultural products are monitored (currently 21 regions are covered). Monitored products and their market prices should include products important for producers such as mineral fertilizers, fuel and lubricants, and pesticides. Information should be collected not only on average prices but also on minimum and maximum prices of agricultural products and, if possible, should include prices for products in wholesale markets in large cities.

Priority measures aimed at improving mechanisms for price monitoring and food security indicators are:

- ✓ To expand the geography of monitoring prices of main agricultural products and enlarge the nomenclature of products (to include mineral fertilizers, fuel and lubricants, and pesticides)

- ✓ To collect information not only on average prices but also on minimum and maximum prices of food, and also to collect information on prices in wholesale markets in large cities and regional centers

- ✓ To streamline the process of monitoring, collecting, and disseminating price information by implementing modern information and communication technologies as well as innovative technologies

- ✓ To improve the monitoring of indicators in order to boost the quality and completeness of information that characterizes the status of food security

- ✓ To improve regulatory and legal acts concerned with food security and nutrition; to update, develop, and approve nutrition requirements such as nutritionally adequate diet requirements, minimum requirements, and recommended diet requirements for each social and demographic population group (by age, gender, employment status, etc.)

Price monitoring at the regional and national level for decision making could enable the government to compare regional prices and implement urgent measures to supply food and reduce prices for certain foods, if necessary.

Systematic data collection would benefit all stakeholder groups because it would help implement government policy aimed at improving the country's well-being in a more efficient and targeted way. In addition, updated and high-quality data would help the ministries involved in developing food security policies to identify the relevant short-term and long-term objectives for the agricultural sector. Improved statistical monitoring of prices would provide a realistic picture of the situation in the food market and help adopt timely and necessary measures to contain increases in prices and inflation. As a result, both consumers and agricultural producers would benefit from more stable prices in the market.

Agricultural producers would also benefit from the dissemination of information about changed prices for food products, mineral fertilizers, fuels and lubricants, and pesticides and their publication in the websites of the Agency on Statistics under the President of the Republic of Tajikistan. Such information would help agricultural producers to make sound decisions about how to sell their produce. If agricultural producers could stay abreast of market developments, they would be able to improve their performance.

Assignment

Analyze the prices in the food market in Tajikistan and assess policy options that are most suitable to make food affordable to all population groups in the country.

Policy Recommendations

With a focus on food security and sustainable revenues of agricultural producers, a successful strategy for optimizing the food price policy should be socially oriented and aim to satisfy needs of the country's population. To pursue this objective, the following measures should be undertaken:

- ✓ Introduce mandatory governmental regulation of the country's food market, taking into account comprehensive development of its major components—that is, its consumer, production, and foreign trade components.

- ✓ Enhance partnerships and cooperation between government (the public sector) and private businesses.

- ✓ Improve the system of product marketing and develop marketing relations in domestic agricultural managing entities.

- ✓ Promote contract-based relations in the Tajik agricultural sector, direct contracts and agreements with producers and trading networks, and enhance the cooperation of producers with representatives of wholesale and retail markets and trading centers.
- ✓ Use measures of administrative and economic regulation of food prices.
- ✓ Implement an efficient mechanism for setting minimum and maximum (cap) food prices.
- ✓ Improve the system of crediting agricultural producers, increase the share of long-term loans in the loan portfolio of the sector, and reduce interest rates.
- ✓ Improve the performance of the Tajikpotrebsoyuz at the national and regional levels.
- ✓ Organize and release intervention stocks, develop and apply public procurement mechanisms, and improve trade and transportation infrastructure.
- ✓ Reinforce public-private partnerships to increase the number of storage and warehouse facilities across the country.
- ✓ Provide incentives in the form of reduced charges for transporting good products along toll roads; construct alternative roads that connect different regions of the country as an alternative to the toll roads.
- ✓ Assist in reducing import dependency by creating enabling conditions for the development of production of staple foods and reducing the disparity of prices between manufactured goods and agricultural products.

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The Kyrgyz Republic's Seed Industry in the Context of the Country's Membership in the Eurasian Economic Union

Abdukhakim Islamov, Abdybek Asanaliev

Executive Summary

The history of **the seed sector** in the Kyrgyz Republic is similar to that of the other post-Soviet countries. Prior to the disintegration of the USSR, its seed farming was based on public procurement contracts and sufficient funding. The disruption of traditional economic relations with other regions of the former USSR, along with its economic decline and agrarian land reform, changed the institutional framework of the seed sector as well as its regulatory and legal framework.

The Kyrgyz Republic has now established **a regulatory and legal framework** that is in line with international standards for the protection of breeders' rights, crop variety testing, seed certification, and quality control. Involved public sector organizations now have better physical infrastructure and equipment. This situation has enabled the country to receive more foreign varieties of key agricultural plant species for testing and to have these varieties registered in the Kyrgyz Republic.

The development of the seed sector has an impact on the agricultural sector in the Kyrgyz Republic, which involves more than half (65 percent) of the country's population. For this reason, the following **state and nongovernmental organizations** are interested in the sustainable development of the seed sector in the Kyrgyz Republic: the Ministry of Economy; the Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic, along with its subordinate entities—the Department of Agricultural Plant Inspection and the Department of Plant Health Protection and Plant Quarantine; the Ministry of Finance; and the National Intellectual Property Service of the Kyrgyz Republic (Kyrgyzpatent), as well as breeding and educational institutions, the processing industry, and the Kyrgyz Seed Association (KSA).

All registered varieties of agricultural plants have high potential yield and are of good quality. At the same time, the actual average values of seed industry performance indicators are twice as low as the officially reported variety testing data as a result of low standards of crop farming. Failures to use crop farming technology in the right way are a consequence of the **lack of financial resources for procuring up-to-date equipment and other inputs**. That is why, in last 25 years, wheat, potato, and maize outputs have not risen above 2.5 metric tons, 18.0 metric tons, and 6.0 metric tons per hectare, respectively.

In spite of the seed industry's declared focus on exporting its products, the domestic market experiences **an acute deficit of certified seeds of most agricultural plants**. For example, the availability of certified maize and potato seeds comprises about 40 percent and only 20 percent of the needs for these crops, respectively, with about 25 percent of supplied winter wheat seeds remaining unconsumed.

In the Kyrgyz Republic, the breeding of new varieties of cereals and forage plants is declining: its development is constrained by the **absence of a royalty collection system**.

The existing legal framework of seed farming should be substantially revised because there is an inconsistency in the documents in connection with membership in the Eurasian Economic Union (EAEU).

Background

The Kyrgyz Republic is located in the northeastern part of Central Asia. It occupies the western part of the Tien Shan mountain system and the northeastern part of the Pamir-Alay mountain system. It is bordered by Uzbekistan to the west (the border is 1,099 kilometers long), Kazakhstan to the north (with a border of 1,051 kilometers), Tajikistan (870 kilometers) to the south, and China (858 kilometers) to the southeast. The Kyrgyz Republic is a country with high mountains and difficult terrain; half of its area is 3,000 meters above sea level. Its inland climate is characterized by high summer temperatures and

aridity while winters bring about strong anticyclones with abrupt changes in air temperatures. Significant diurnal, monthly, and annual temperature fluctuations are observed: in arable valleys, summer air temperatures reach 45–48°C, and winter temperatures fall below −30°C with scarce snow cover; night temperatures are usually lower than day temperatures by 12–15°C.

The country's average annual precipitation rates never exceed 500 millimeters, although it varies by region and the bulk of precipitation falls in springtime. But some regions have higher precipitation rates; in particular, the high-altitude Issyk Kul Lake affects the precipitation level in the Issyk Kul basin, which is therefore higher than it would be otherwise.

The country's area comprises about 20 million hectares, including 10.6 million hectares of agricultural land, of which 1.2 million hectares is arable land with a total of 0.8 million irrigated hectares. The environmental and climatic conditions favor the cultivation of many crops, including almost all vegetables. Over 60 percent of the population is rural, and their livelihoods depend on agriculture.

In the Kyrgyz Republic, the ownership pattern of agricultural assets is dominated by small private farms (there are over 380,000 of these farms, with an average land area of about 3.0 hectares; see Table 1). They have emerged as a result of the privatization of *kolkhozes'* and *sovkhozes'* land and property.[1] Most farms do not have adequate financial resources for effective farming based on advanced technology, up-to-date tractors, or other modern agricultural machinery. A direct consequence of this shortage is low labor productivity and low capital/labor ratios, high shares of fixed costs and high operation risks, unstable and low revenues from crop farming.

A comparison of Kyrgyz cropland areas before (in 2011) and after its accession to the Eurasian Eco-

Table 1: Average Cropland Areas and Yields

Crop	Average area (1,000 hectares)	Yield (100 kilograms per hectare)	Average area (1,000 hectares)	Yield (100 kilograms per hectare)
	2011		2016	
Wheat	377.4	21. 4	270.4	17.0
Barley	123.3	19.2	184.6	22.5
Grain maize	74.4	59. 0	101.7	62.4
Grain legumes	46.2	16. 5	56.5	17.2
Sugar beet	8.1	197.1	11.3	623.2
Oil-bearing crops	54.2	10.4	41.3	10.2
Cotton	37.4	27.2	16.6	31.4
Tobacco	4.1	21.2	0.2	24.5
Potato	84.9	160. 8	82.1	166.3
Vegetables	42.8	182.0	51.2	194.4
Gourd fields	7.0	213.3	10.6	219.4
Fodder crops				
Grasses	257.2		343.4	

Source: National Statistical Committee of the Kyrgyz Republic 2016.

[1] A *kolkhoz* is a collective farm; a *sovkhoz* is a Soviet farm.

nomic Union (in 2016) reveals an upward trend in the areas under maize, barley, and fodder grasses at the expense of the reduction of wheat fields by 100,000 hectares. The outputs of sugar beet, vegetables, and grain maize have been also evidently growing owing to improved cultivation technology for the cultivation of new high-yield varieties and hybrids of these species, whereas the yield of wheat remains very low even though it occupies the largest arable areas.

It is noteworthy that all varieties of spiked cereals officially tested and included in the Kyrgyz National Registry of Plant Varieties and Hybrids have high potential yields (at least 60 hundred kilograms per hectare). [2]

The development of crop farming in the Kyrgyz Republic is, to a great extent, dependent on the availability of agricultural machinery for Kyrgyz farms. But this availability is less than 50 to 60 percent of the machinery that is needed (in addition, over 90 percent of all machines have been in operation for more than 25 years) in spite of the agricultural equipment modernization programs that have been adopted over the last five years. Despite the efforts made by the Government of the Kyrgyz Republic to implement leasing packages, the number of those who would want to acquire machines offered on a leasing basis is limited because, working on small parcels of land, it would be difficult to repay the expenses on acquired machines.

In 2015, upon the accession of the Kyrgyz Republic to the Eurasian Economic Union, Kyrgyz producers of agricultural products had to compete with producers of wheat, barley, and flour and other products from other member countries of the Eurasian Economic Union. This need for competition has affected the cropland structure, changing it to increase outputs of more intensively managed field crops, fruit and vegetables.

The Current Situation in the Kyrgyz Seed Sector

Prior to 1991, Kyrgyz seeds for domestic consumption and export to other regions of the USSR were supplied by 45 seed farms (both state-owned and community farms, each occupying at least 4,000–5,000 hectares on average), and by the *Sortsemovoshch* enterprise and fruit tree nurseries. All these entities had had full-fledged government support based on a scheme of bonuses for high quality and marketing of all outputs. Currently, as a result of agrarian land reform, agriculture has only a limited number of producers that still have operational and human resource capacity; most of these producers focus on cereal seed production (see Table 2).

Owing to its geography and implementation of seed production projects, and supported by the World Bank, the European Union, the Swedish International Development Agency (SIDA), USAID, and the United Nations Food and Agriculture Organization (FAO) from 1997 to 2014, the Kyrgyz Republic has untapped unique potential and comparative advantages in the region to produce seeds of many agricultural plant species. These advantages include:

- ✓ A good regulatory and legal framework that complies with international standards
- ✓ Opportunities for international seed certification of cereals, beet, legumes, and grasses based on the Organisation for Economic Co-operation and Development (OECD) Seed Schemes and International Seed Testing Association (ISTA) Rules
- ✓ Membership in the International Union for the Protection of New Varieties of Plants (UPOV) since 2000
- ✓ Membership in the Asia and Pacific Seed Association (APSA)

[2] Spiked cereals include wheat, rye, triticale, barley, and oats.

Table 2: Needs of Kyrgyz Agricultural Producers in Seed and Planting Stock

Crop	Sowing area (1,000 hectares)	Need (1,000 metric tons)	Domestic (certified) seeds (%)	Share of imports	Average cost (US$, millions) (US$1 = KGS 70)
Cereals (wheat, barley)	500.0	100.00	50%	—	30.0
Potato	80.0	240.00	30%	10 % imported	100.0
Sugar beet	10.0	20.00	10%	90 % imported	1.0
Perennial grasses (alfalfa, sainfoin)	300.0	3.50	25%	10 % imported	9.0
Vegetables	50.0	1.15	—	90% imported	15.0
Maize	100.0	2.20	15%	40 % imported	8.00
Cotton	25.0	2.00	40%	30% imported	1.5
Oil-bearing plants (sunflower, safflower)	50.0	0.75	70%	20 % imported	1.0
Fruit	50.0	1,500,000 young plants	—	25 % imported	3.0

Source: The Kyrgyz Seed Association (KSA) Annual Report 2016.
Note: — = not available.

As of 2017, the country has over 150 farms that have the status of seed production facilities, designated to produce seeds of various agricultural plants; their total sowing area is under 50,000 hectares.

The Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic regularly furnishes official reports on the availability of seeds of main agricultural plants. According to these reports, the demand for seeds is 100 percent satisfied. At the same time, there is a deficit in certified seeds; this deficit is covered by farmers on their own—that is, through using non-graded seeds. This testifies to the existence of an informal sector in seed industry.

Recent years have seen a rise in agricultural seed and other imports from member countries of the Eurasian Economic Union—in particular, from the Russian Federation and Kazakhstan. This increase is driven not only by the removal of earlier existing customs barriers, but also by the devaluation of the Russian and Kazakhstan national currencies.

It must be noted that, even with the well-developed institutional and regulatory frameworks of the Kyrgyz seed sector, domestic demand for certified seeds of most agricultural plants is not met. For example, domestically produced seeds cover no more than 50 percent of the needs for spiked cereals, 15 percent for maize, 25 percent for potatoes, and 10 percent for fodder grasses (alfalfa and sainfoin). Ninety percent of the seeds used to grow vegetables and sugar beets are imported, as well as 40 percent of maize seeds, with part of these seeds (maize and vegetables) illegally imported from China.

The existing deficit of seeds (mainly seeds of spiked cereals) arises primarily from:

- ✓ high sowing rates due to the poor quality of seeds, non-observance of optimum sowing time, and worn-out machinery for soil preparation and seeding as well as for seed processing, and
- ✓ low harvests from seed crops of cereals.

It should be also noted that the Kyrgyz Republic had been a Soviet center of seed production for sugar

beet, maize, and alfalfa, but, by 2007, it had lost its status as a regional seed production and export center for these agricultural plants (Table 3).

Regulatory and Legal Framework

The existing laws and regulations on agricultural plant seed breeding and production provide a legal framework for sustainable development of the sector. Most laws were adopted during the implementation of seed industry development projects and were based on recommendations of international consultants. However, there is an acute problem with their enforcement and it is necessary to align them with other bylaws, taking into account the current economic situation in the country as a whole and in agriculture, in particular.

The Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic makes amendments to the following laws and regulations on seed farming, but without consultation with all stakeholders:

- ✓ The law "On Seeds" was adopted in 1997 and finally amended on February 15, 2017

Table 3: Seed Outputs for Export and Export Earnings, 1998–2006

Year	Unit	Maize	Sugar beet	Alfalfa	Total
1998	Metric tons	30.0	174.5	22.0	226.5
	Kyrgystani soms, 1,000	34.0	19,937.2	385.0	20,356.7
1999	Metric tons	40.0	167.1	29.6	236.7
	Kyrgystani soms, 1,000	80.0	28,373.7	523.3	28,977.0
2000	Metric tons	20.0	91.9	5.0	116.9
	Kyrgystani soms, 1,000	70.0	14,502.3	25.0	14,597.3
2001	Metric tons	12.5	61.8	0.2	74.5
	Kyrgystani soms, 1,000	62.5	11,062.6	18.2	11,143.3
2002	Metric tons	70.9	112.1	24.0	207.0
	Kyrgystani soms, 1,000	558.6	34,515.8	686.6	35,761.0
2003	Metric tons	—	123.7	—	123.7
	Kyrgystani soms, 1,000	—	36,557.7	—	36,557.7
2004	Metric tons	—	84.7	—	84.7
	Kyrgystani soms, 1,000	—	18,569.8	—	18,569.8
2005	Metric tons	—	12.4	7.0	19.4
	Kyrgystani soms, 1,000	—	2,798.8	62.7	2,861.5
2006	Metric tons	—	7.0	5.0	12.0
	Kyrgystani soms, 1,000	—	1,792.6	40.0	1,832.6

Source: The Kyrgyz Seed Association (KSA) Annual Report 2016.

Note: — = not available.

- ✓ The law of the Kyrgyz Republic "On Legal Protection of Seed Breeding Achievements" was adopted on May 26, 1998, and amended on March 31, 2005
- ✓ The Administrative Code of the Kyrgyz Republic
- ✓ Resolution of the Government of the Kyrgyz Republic # 697 of October 25, 2006, to approve the regulation "On Seed Farms in the Kyrgyz Republic"
- ✓ Resolution of the Government of the Kyrgyz Republic #178 of March 13, 2009, to approve the list of seed farms in the Kyrgyz Republic

The law "On Seeds" refers to the Registry of Producers and Suppliers of Seeds and Planting Stock to be made by an authorized organization, but such a Registry does not actually exist.

The Strategy of Agriculture Development of the Kyrgyz Republic includes provisions concerning the promotion of organic products that should be associated with the use of genetically modified organisms (GMOs); however, the effective law "On Seeds" and other documents lack certainty with respect to the use of GMOs in the country.

The effective regulation "On Seed Farms" was adopted by the Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic in 2006 without consultation with the KSA. It is not consistent with the present-day conditions of the market economy; moreover, it is in conflict with the law "On Seeds"; in its formal nature, it is a tool of "hidden" licensing to be used by government entities and it should be revised as soon as possible.

Lack of harmony among the laws and regulations governing and influencing the seed sector (the Land Code, the Administrative Code, and so on) makes it necessary to review the law "On Seeds" and its bylaws to assess their consistency with the current realities; to amend their main articles regulating import and export with due regard to proposals from all stakeholders, especially those from the real sector of seed and planting stock production and supply; and to assign the functions of statistic data collection to a specific organization as well as to address GMO importation and use.

Stakeholders

The Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic and its subordinated entities

This ministry is in charge of the seed industry and is striving to promote efficient and sustainable development of seed production with a view to meeting the needs of farms for the seeds of agricultural plants cultivated in the country. Its functions include the systematic analysis of the economic situation in agriculture, water management, food and food processing industries, and agricultural export/imports and the identification of strategic priorities for the development of these sectors on the basis of such analysis. It is the executive authority responsible for food security and implementation of respective programs in this area. The ministry operates with two departments:

- ✓ **The Department of Agricultural Plant Inspection.** This department was established by merging the National Centre for Plant Species Variety Testing and Plant Genetic Resources, the Kyrgyz National Seed Inspectorate, and the Centre of Grain Inspection. Its key objectives are to:

- monitor varietal and sowing characteristics of agricultural and other plant seeds and planting stock;

- undertake field inspections of seeded and planted areas, and testing of seed lots on the ground;
- assess sowing characteristics of agricultural seeds and planting stock, the quality of grains, and their processing products; and
- assess and monitor the quality of grains from agricultural crops and their processing products (such as flour, bran, and milling offal) supplied to recipient enterprises and other managing entities regardless of their ownership.

✓ **The Department of Plant Health Protection and Plant Quarantine.** This department is designated to:

- develop and regularly update plant quarantine safeguards;
- prevent the penetration and/or spread of quarantined hazardous organisms in the country;
- prevent damage from the spread of quarantine pernicious organisms;
- cause the commitments of the Kyrgyz Republic to be met under the quarantine-related international treaties made effective in accordance with the established procedures.

The Ministry of Economy of the Kyrgyz Republic

This ministry's responsibilities are:

✓ to forecast, review, and evaluate social and economic development in the Kyrgyz Republic;

✓ to develop and implement the country's economic policy, including methods and tools for macroeconomic stabilization;

✓ to develop and implement the country's policy with respect to direct investment based on economic development priorities;

✓ to develop and take export control measures;

✓ to ensure continuous optimization of the regulatory and legal framework of entrepreneurs' activities;

✓ to prepare proposals related to the development and implementation of the country's policy with respect to technical regulation and assurance of measurement uniformity;

✓ to develop and implement the country's foreign and domestic trade policy, including policy measures to promote Kyrgyz goods into international markets;

✓ to design measures to improve foreign trade performance, and to develop and encourage the export of products and to build up export capacity of the country;

✓ to develop proposals on how to align foreign trade with the requirements and rules of the World Trade Organization (WTO), commitments to partners from the Eurasian Economic Union, and negotiations about accession to the Customs Union and Common Economic Space;

✓ to develop proposals on customs and tariff and non-tariff regulation of foreign trade;

✓ to maintain the Integrated Registry of Public Services provided by executive authorities and their structural units; and

✓ to draft regulations on the accumulation, release, and lending of tangible assets from the government reserves, on the annual proceeds of tangible assets to the government reserves, and on amounts of their financing out of the budget.

The Ministry of Finance of the Kyrgyz Republic

This ministry's responsibilities are as follows:

- ✓ to develop the national policy of public finance management and non-tax payments;
- ✓ to improve the laws and regulations on internal audit, accounting, and financial reporting in public administration and public procurement; and
- ✓ to manage domestic and foreign sovereign debt of the Kyrgyz Republic.

In particular, according to the Resolution of the Government of the Kyrgyz Republic (of March 15, 2017) "On Measures to Support Seed Farming Development and Dissemination of High-Yield Varieties of Fruit and Berry Crops in the Kyrgyz Republic," the Ministry of Finance was instructed to earmark funding for governmental grants to Kyrgyz seed farms in the national budget for 2018–2022, after the approval of a law/regulation, providing for the introduction of a system of governmental grants.

At the same time, the Government of the Kyrgyz Republic encourages local self-government bodies to increase the period of land lease for seed farming to 20 years.

The Population of the Kyrgyz Republic Engaged in Agriculture

As a reminder, 65 percent of the country's population lives in rural areas, and agriculture accounts for about 15 percent in the total GDP. Livestock breeding is an important rural industry that depends on the supply of fodder, which in turn depends on seed supply to cultivate fodder crops.

A big share of livestock outputs, vegetables, fruit, and berry products comes from private farmsteads, and the seed industry should be developed with due regard to the needs of this stakeholder.

National Intellectual Property Service of the Kyrgyz Republic (Kyrgyzpatent)

This stakeholder is in charge of all matters related to the protection of varieties. It is responsible for protection of new varieties included in the Registry upon official variety testing.

Processing Industries

These are represented by the Association of Fruit Processors, which brings together over 30 processing enterprises producing fruit and vegetables, meat and dairy products, flour mills and beer production facilities that are keen to have a well-developed national seed industry as a basis for the production of crop farming products in sufficient quantities. In view of this, seed breeding and seed production for industrial crops (such as cotton, sugar beet, tobacco, and so on) should be always agreed upon and sponsored by processing enterprises, procuring outputs from cultivation of these crops.

Kyrgyz Seed Association (KSA)

This is an independent body established to represent and pursue the interests of all actors in commercial seed production, including marketing and trade companies. The KSA helps promote high standards of behavior among its members, in particular concerning compliance with the requirements set forth in contracts and licensing agreements.

Breeding Institutions

These institutions comprise another important stakeholder. The Kyrgyz Research Institute of Ar-

able Farming, Kyrgyz Research Institute of Livestock Breeding and Pastures, OAO MIS Company, and private breeders are responsible for breeding agricultural plant species varieties and for their promotion and maintenance breeding.

Kyrgyz Agrarian University

The university is keen to meet the demand of farms for high-level specialists with technology and management skills.

Policy Issues

Currently the Kyrgyz seed sector, with its 150 seed farms, fails to produce sufficient seed outputs to meet the needs of its agriculture even though there is an accredited ISTA (International Seed Testing Association) Laboratory in the country. And even though the sector participates in the OECD Seed Schemes,[3] seed imports prevail over seed exports for many agricultural plants. Such a situation is accounted for by the following factors:

- ✓ There is no national seed policy that would envisage a fundamental role for the private sector in seed production, supply, and trade with clearly defined (1) species priorities in seed production both domestic and for importing, (2) implementation timeframes, and (3) functions of all key actors in the seed sector.
- ✓ The government does not offer mechanisms to provide incentives for the consolidation of individual producers into up-to-date seed production companies.
- ✓ Chances to attract long-term investments in seed production are limited because of the lack of affordable and long-term credit opportunities as well as limited and uncertain periods for leasing land from the Agricultural Land Redistribution Fund.

Sector-Specific Issues

Policies could also address several sector-specific issues in the following areas:

Insufficient and low quality of arable land for seed farms. Although the regulation "On Seed Farms" sets minimum area requirements for land parcels, 38 percent of seed farms have parcels smaller than 50 hectares and only 30 percent have parcels larger than 100 hectares. This is statistical evidence of seed farms' problems with land areas.

Human resource deficit in seed farming. Most seed industry entities suffer from a lack of skills in the workforce arising primarily from the aging of staff, the nonexistence of a system of sector-specific vocational training, and low remuneration.

Seed and planting stock exportation and importation. The financial sustainability of Kyrgyz seed producers is deeply affected by imports and smuggling. The seed markets for maize (with a total demand estimated at 2,200 metric tons and an average cost of about US$10.0 million) and for sugar beet (with an average cost of US$2.0 million) are gradually being taken over by foreign companies, which already supply over 80 percent of vegetable seeds.

For example, in recent years the devaluation of the ruble resulted in increased imports of cheap, unregistered varieties of seeds and hybrids of some agricultural plants from the Russian Federation, which impairs the sales of seeds of both domestic and foreign producers.

[3] For more information about the OECD Seed Schemes, see http://www.oecd.org/tad/code/abouttheoecdseedschemes.htm

In addition, another issue emerged related to laws and regulations governing seed importation and trade: according to the law "On Seeds," seeds of varieties and hybrids not authorized for cultivation in the country may be imported if the Ministry of Agriculture, Food Industry and Melioration has issued such a permit with its existence to be checked by the customs officers at the border.

To remove the customs barriers at the inner frontiers of the Customs Union and the Eurasian Economic Union, it is necessary to revise the functions of certain services and public sector organizations in order to control and regulate imports as well as to have an effective system of recording/reporting for seed and planting stock importation and exportation.

Counterfeit. Counterfeits are a major obstacle for the development of agricultural seed industry and the production of a planting stock of fruit and berry species. The country has no legal framework for addressing counterfeit-related disputes.

For this reason, the first priority to be addressed to protect rights of all consumers of seeds and planting stock is to introduce a system of obligatory marking/labeling and tracing of sold seeds and planting stock. This would require amendments to regulations and laws, including those defining the liability for offences in connection with counterfeits.

Issues with protection of new varieties. In the Kyrgyz Republic, the protection of new varieties of plant species is governed the law "On Breeding Achievements" (1998). In 2003, this law was amended to streamline the procedures of restoring rights that had been lost as a result of failures to pay. As of 2017, *Kyrgyzpatent* had issued 21 patents to protect the rights, primarily for wheat varieties bred by local breeders. The "royalty" is payable for the use of a proprietary variety. However, only four of these patented rights were "reserved" by making annual payments, and none of them was used as the basis for licensing agreements or collecting royalties. Some duties, related to protection of varieties, were substantially reduced, but this failed to motivate breeders to protect their rights. So, although the plant variety protection system has been in place for over 20 years, breeders do not use it except to have patents for their varieties issued. Potential revenue from a properly organized collection of royalties for the use of locally bred varieties of wheat and barley is estimated at 30 million Kyrgyz soms per year. This is six times more than the public funds allocated by government and covers only the spending on remuneration for staff of the Kyrgyz Research Institute of Arable Farming as the holder of patents for respective varieties of cereal species. In addition, the small size of the seed market acts as a disincentive for foreign breeders to protect their rights in the Kyrgyz Republic (Table 4).

Thus the identified problems of seed farming make it rather difficult for the seed sector to operate and constrain its development. For this reason, it has become necessary to overhaul the strategy, key principles, and legal framework of the seed sector.

General Conclusions

- ✓ Most agencies of the seed sector fail to contribute to successful development of the seed industry.
- ✓ Government funding for the seed industry development is used inefficiently.
- ✓ In spite of government funding, the country continues to experience insufficient wheat, barley, and maize seeds.
- ✓ There is a failure to achieve the overarching goal of government regulation and support for the seed sector—that is, a failure to provide crop farmers with high-quality, affordable and safe seeds, to build up the export capacity of

Table 4: Origins of Agricultural Plant Species Varieties/Hybrids, Authorized for Use in the Kyrgyz Republic with their Breeders' Rights Protected in 2017

Crop species		Origins of varieties						
		Kyrgyz Republic						
Species	Total different species	Kyrgyz Research Institute of Arable Farming	Other breeding institutions	Republic of Kazakhstan	Russian Federation	Republic of Belarus	Other countries	Protected varieties
Winter wheat	56	14	8	12	11	—	6	5
Spring wheat	14	5	2	4	1	—	2	—
Winter barley	15	6	2	—	2	—	2	—
Spring barley	30	9	—	4	6	—	7	—
Grain maize	40	4	—	5	1	—	30	—
Sugar beet	29	3	—	—	—	—	—	—
Potato	40	1	3	—	1	—	—	—
Fodder grasses	—	—	—	—	—	—	—	—
Alfalfa	11	6	—	—	—	1	4	—
Sainfoin	2	2	—	—	—	—		—
Soya	19	—	3	3	—	—	14	—
Sunflower	7	—	—	—	—	—	7	—
Safflower	3	—	—	—	—	—	3	—

Source: State Register of plant species varieties and hybrids authorized for use in the Kyrgyz Republic 2017.
Note: — = not available.

seed farms, and to create incentives for seed exportation.

Policy Options

There are four distinct areas that could benefit from specific policies. These are discussed below with explanations of both the need and a specific recommendation for addressing it.

1. Policy options for enhancing variety breeding, testing, registration, and protection of intellectual property rights to varieties

It is necessary to evaluate the performance of national breeding research institutes to improve the efficiency of their expenditures, to identify their priority activities, and, at the same time, to encourage them to cooperate with other countries in the region.

It is necessary to preserve the existing fast-track procedure for the introduction of the best foreign varieties of all agricultural, vegetable, and fruit/berry species. The application of this procedure must be contingent on prior testing and registration of these foreign varieties at the National Seed Testing and Genetic Resource Centre, along with mandatory checks to exclude quarantine items. Such a decision should be formalized as a regulation.

Seeds, imported to the country for sale, must meet the minimum quality standards for germination, purity, and plant health as set forth in the established rules.

Strict statistical records of seed imports and exports must be maintained. This function could be assumed by the seed production units of the Ministry

of Agriculture, Food Industry and Melioration of the Kyrgyz Republic or by its Department of Plant Quarantine (this department is in charge of the issuance and checks of plant health certificates at the point of importation/exportation of seeds and planting stock).

A legislative requirement must be established to ensure that the agencies responsible for testing and registering new varieties are obliged to disclose (publish) the sources of information about the results of testing of new promising varieties and hybrids in order to assess their economic value in all the regions of the country, including their qualitative characteristics. The yearbook, called the *National Registry of Varieties and Hybrids Authorized for Use in the Kyrgyz Republic*, would be a good place to publish this practical and needed information for producers, but it fails to do so.

The breeding institutions, the KSA, and the seed certification and quality control authority should design royalty collection arrangements based on licensing agreements with the breeders.

To enhance contacts and cooperation with seed producers, breeders should become members of the KSA and actively participate in its work. Their membership in the KSA will be conducive to the collection of royalties and will enable them to receive feedback from users of the varieties.

2. Policy options for ensuring sufficient seed production

In view of the land area for the required crop rotations and production of certified seeds in adequate quantities, it is strongly recommended that producers practice contract-based production—this means that unprocessed seeds would be supplied by non-seed farms to registered seed companies contingent on compliance with all the rules for the production process.

To register seed farms in accordance with the regulation "On Seed Farms" to justify public support based on their actual annual seed outputs, and to avoid abuse of benefits granted to seed farming enterprises, the eligibility criteria for registration must be revised.

Establishing facilities that can produce seeds of new varieties for agricultural crops, jointly with breeding institutions from the Eurasian Economic Union in the Kyrgyz Republic, would enable those facilities to obtain international OECD and ISTA certificates and to export the outputs to those third countries where the issuance of such certificates a mandatory requirement.

Profitability of seed production and trade can be ensured only if selling prices for seeds reflect the full cost of production and include the royalties to be reimbursed to the variety breeders.

3. Policy options for ensuring seed quality control

All standards related to seed certification and quality assurance must be aligned with those of the Eurasian Economic Union member countries, possibly on the basis of the OECD and ISTA rules. In particular, in the Kyrgyz Republic, an OECD member country may not assign the same seed material category to next-generation material in consecutive years, whereas this is not regarded as a violation in other countries of the Eurasian Economic Union.[4]

Agricultural seed farming standards applied in the country must be similar to such standards other countries to harmonize international trade.

[4] The categories are *original seed material*, which is produced by the originator; *elite seed material*, which is derived from the original seed material; and *next field generations*, which come from the elite group.

It is necessary to evaluate, monitor, and check the usefulness of the Kyrgyz Republic's membership in international organizations (the International Seed Testing Association/ISTA, OECD Seed Schemes for sugar beet, cereals, legumes, and grasses), based on whether this membership has a favorable impact on respective subsectors of the seed industry.

4. Policy options for boosting human resource capacity building

A high-priority objective is to train young people to develop their sector-specific managerial skills for seed farming and agricultural business in general.

All academic and vocational training courses of agricultural education should include information about seed farming in the context of plant breeding and agricultural business management and governance.

It is necessary to obligatorily provide courses of vocational training in seed production, processing, and marketing to develop human resources for all levels and areas of the seed industry.

Assignment

First, assess the current situation in the Kyrgyz seed sector to see the change in the seed flow pattern as a result of implemented agrarian land reform. In light of this assessment, evaluate the performance and opportunities of various policy options and propose adequate measures related to domestic seed supply and seed imports to ensure seed security in the period up to 2025.

It is advisable to conduct a SWOT analysis. SWOT is a strategic planning tool that aids in identifying various factors and grouping them into four categories: Strengths, Weaknesses, Opportunities, and Threats. See Annex 1.

Recommendations

- ✓ Review, finalize, and adopt a national seed policy as soon as possible.
- ✓ Amend laws and bylaws—including the law "On Seeds" and regulation "On Seed Farms" that currently in effect—on the basis of the regulatory impact evaluation of the laws and regulations governing the seed sector and recommendations on their harmonization.
- ✓ Amend laws to encourage the consolidation of farms as well as to attract foreign investment in the context of the Kyrgyz Republic's accession to the Customs Union, resulting in expanded markets for seeds produced in the country.
- ✓ Cause local government bodies to make available, as soon as possible, land parcels from the Agricultural Land Redistribution Fund for seed farming and long-term credit opportunities for seed production retrofitting (at least for 20 years) in order to attract domestic and foreign investment into the seed sector and put in place up-to-date seed companies.

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Annex 1

SWOT Analysis of the Seed Industry in the Kyrgyz Republic

Strengths	Weaknesses	Opportunities	Threats
The country has all needed regulatory institutions and a legal framework to support an up-to-date seed industry. According to international experts, the Kyrgyz Republic is an advanced country in Central Asia (and maybe even in the Commonwealth of Independent States as a whole) in the area of seed farming. During the Soviet period, alfalfa seed exports were a major business for the country. Other significant seed outputs and exports were those of sugar beet, maize, and some vegetable species, owing to the relatively favorable climate as compared with other regions of the USSR. The Kyrgyz Republic was among the leaders not only in cattle breeding but also in seed production. Since 2000, the Kyrgyz Republic has been implementing reforms toward compliance with international performance standards, sustainability in the seed sector, and improved national seed certification with support from the European Commission (EC), the World Bank (under the Agriculture Productivity and Nutrition Improvement Project), and SIDA (the Swedish International Development Agency). Since 2003, the Kyrgyz Republic has been a member of the International Seed Testing Association (ISTA). Its Central Seed Laboratory (CSL) is authorized to issue the International Orange Certificate for seeds; this is an International Seed Analysis Certificate issued in accordance with the rules of the International Seed Testing Association (https://www.seedtest.org/en/ista-certificates-_content---1--1080.html). In 2000, the Kyrgyz Republic became a member of the International Union for the Protection of New Varieties of Plants (UPOV, French abbreviation).	Structural problems of Kyrgyz agriculture have led to the following adverse developments: • Fragmentation of land assets with consequent predominance of small-scale production capacities • Deterioration of irrigation infrastructure • Poor knowledge of agriculture among owners of small farms • Lack of investment and heavy dependence on credit even for seasonal operations Seed farming was most severely affected by land reform because it requires large manageable fields to use appropriate technology and machinery. Land needs for seed farms are estimated at 100,000 hectares at a minimum, while the actual available land area is only 40,000 hectares for all seed farms—that is, there is an acute deficit of land (especially in the south). • Ideally, a seed farm should have at least 300 hectares to adhere to rotation requirements (it would desirable to have seven-course rotations) • In practice, only 17 percent of seed farms have sufficient land areas. • There is a lack of adequate storage facilities and equipment. • There is only one up-to-date seed processing facility in the country, in addition to 12 mobile Petkus seed cleaning units, supplied in 2014 under a credit line The National (Interagency) Seed Council exists only on paper: it has no regular meetings and fails to play its role. • There is still no national seed farming policy to guide the activities of the Council. The domestic seed market is small. Funds from the public budget are used inefficiently. The production cost of domestically produced seed remains high. The system of protection of varieties was not able to bring about expected	The Ministry of Agriculture, Food Industry and Melioration of the Kyrgyz Republic and high-standing government officials view seed farming as a sector of top priority, which reflects a special status of the Kyrgyz Republic as a seed producer in the territory of the former Soviet Union. There is a will indeed to address challenges facing the seed sector both for the sake of increasing export earnings and to ensure food security in the country. The domestic demand for good-quality seeds is fairly high, which means that seed farms have opportunities to build up their production capacities and increase outputs to meet the needs of the domestic market. It is possible to study international (European, American, Russian, and Kazakh) best practices of licensing and royalty collection, which should be discussed as a way to address this issue. Seeds of agricultural plants, including vegetables, can be produced jointly with foreign companies and under contracts with them. Potato seed (tuber) production is a promising development area for farmers, particularly in view of the climatic advantages in the region. Preparation of a comprehensive catalogue of plant varieties for the region is highly needed, and the National Centre for Plant Species Variety Testing and Plant Genetic Resources, which	Frequent changes of Ministers impede efforts to support appropriate seed farming reforms in a consistent manner. Seeds from the Eurasian Economic Union member countries (Russia, Kazakhstan, and Belarus) can occupy a significant part of the seed market, especially for grain crops.

Strengths	Weaknesses	Opportunities	Threats
Wheat, barley, rye, oat, sugar beet, alfalfa, sainfoin, bean, grasses, and fodder greens are grown in accordance with the OECD schemes. These schemes do not impair seed production: on the contrary, observance of these rules helps to improve seed quality and promote seed exports. The regulatory institutions have a high human resource capacity to address seed farming matters and provide training to other Commonwealth of Independent State countries. In January 2007 the law "On Seed Farming" was adopted. A key provision of this law was to establish a national (interagency) seed council to coordinate and monitor the development of the seed sector. In 2000, the Kyrgyz Seed Association (KSA) was established to act as a catalyzer of seed industry development. In 2008 the law "On Food Security" was adopted.	benefits because of the high cost of protection compared with potential revenues from royalties. Land inspection and land use planning matters were moved from the jurisdiction of the Ministry of Agriculture, Food Industry and Melioration to the jurisdiction of the National Registration Service of the Kyrgyz Republic. In many countries, land inspection responsibilities rest with the ministries of agriculture. In the 1990s, the Agricultural Land Redistribution Fund was transferred to the jurisdiction of rural community boards (some experts deem it to be a mistake). Arable land is used inefficiently or for purposes other than those for which it is designated. The poor performance of the customs offices results in the smuggling of seeds (maize, vegetables) in great amounts. No licensing agreements have been signed and, hence, no royalties have ever been collected to support efforts to preserve and propagate respective varieties. The result is that: • resources of Kyrgyz breeders remain very limited; and • there is neither a strong desire nor a good tool to protect the rights of breeders. So far, the KSA fails to live up to the expectations that it would act as a catalyzer of seed industry development. Marketing is, as earlier, a major problem because seed farms (comprising the majority of the KSA members) have little experience of operating in the market economy environments. There is a critical need for a new generation of specialists, knowledgeable in technical and commercial issues in crop farming and seed production.	is part of the Department of Agricultural Plant Inspection, could play a key role in this process because it has the greatest experience with such work. Another opportunity is to participate in the implementation of regional initiatives to harmonize the trading rules for varieties and seeds.	

Appendix

Suggested Teaching Methodology Based on the Cornell Case Study Approach

The case studies presented in this publication and others available at http://cip.cornell.edu/gfs were developed for use in graduate and undergraduate teaching at Cornell University and subsequently adopted by other universities in the United States, Africa and Asia, using a participatory social entrepreneurship teaching methodology developed by Professor Per Pinstrup-Andersen, Cornell University. The overall objective of the methodology is to strengthen the analytical capacity of the students within the context of a simulated food policy context. Evaluations by students during the 12 years the methodology has been used have been consistently positive and enthusiastic. To be successful, the methodology requires preparations by both students and instructors prior to each class. The case(s) to be discussed should be made available to the students at least a week prior to the class and it is critically important that all students have read the case study prior to coming to class and be prepared to discuss the pros and cons of various policy options from the point of view of each stakeholder group identified in the case study.

The class should be run as a simulated role-playing meeting of stakeholder group representatives interested in the particular food policy issue to be discussed. One or two students, who should simulate the role as external consultant(s), should give a 10 to 15 minute overview presentation of the case, with emphasis on the policy options identified in the case study and a policy recommendation. Each of the remaining students should be assigned the role of a stakeholder group representative. The assignment may be made a week ahead of the class session or at the beginning of the class session. Then follows a debate moderated by the instructor in which each stakeholder representative expresses his/her position about the various policy options and the consultants' recommendation.

The moderator should guide the debate by following up on the points made and seek the response from other stakeholder groups. The moderator should call on specific representatives as needed to maintain an exciting, cohesive, and fast-moving debate. Attempts should be made to arrive at a consensus around the consultants' recommendation or one or more policy options. In cases when no consensus can be obtained (likely to be the majority of cases), a brief discussion should be held on the relative power of each stakeholder group and which one is likely to make the final decision about the policy option to be pursued. The length of the debate section of the class depends on the length of the class session. In a 50 minute class session, the debate portion should be limited to 25 minutes, leaving the last 10 to 15 minutes of each class session for the instructor to pull the findings of the debate together and relate them to the broader food policy issue within which the case study belongs. Such a "mini-lecture"—in which the students' experience from the debate and the written version of the case study is placed in a broader food policy context—is critically important.

In order to ensure that all students participate actively, it is recommended that the class size be limited to 20–25 students. Although the methodology was developed for real-time classroom instruction, it could also be used in online distance learning, particularly if real-time video-based interaction among the students could be included. While the above-mentioned mini-lectures would help ensure a cohesive food policy course, experience at Cornell University indicates that the integration of a few lectures based on a textbook would further strengthen the cohesiveness of the course. The textbook used at Cornell is Food Policy for Developing Countries by Per Pinstrup-Andersen and Derrill Watson, Cornell University Press, 2012.

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Case studies