



UNIVERSITY
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Food Security and the Agricultural Cooperation Agenda in Central Asia with a Focus on Tajikistan

Shokhboz Asadov



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Abstract

The global rise in food prices, significant dependence on food staple imports, and the temporary wheat export bans by the region's main producers is having a dramatic impact on the lives of millions in Central Asia. This is particularly the case in Tajikistan which has faced a series of natural calamities and poor economic performance over the past few years. This paper reviews the current status of food security, nutritional trends and food balance in the low-income countries of the Central Asia, and wheat production in the region. It proposes a regional agricultural cooperation framework to ensure a sustainable supply of main agricultural crops from net exporting countries of the region.

Keywords

Tajikistan, Food Security, Agriculture

JEL Codes: I32, O13, Q12, Q18

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Acronyms

CA	Central Asian
CIS	Commonwealth of Independent States
FAO	Food and Agriculture Organization
GBAO	Gorno-Badakhshan Autonomous Oblast
GKS	Gosudartvenniy Komitet Statistiki (State Statistics Committee, Tajikistan)
Ha	Hectare
Hg	Hectogram
IDR	Import Dependency Ratio
IFPRI	International Food Policy Research Institute
IGC	International Grains Council
IPPA, UCA	Institute of Public Policy and Administration, University of Central Asia
k/calories	Kilocalories
KSA	Agency for Statistics of the Republic of Kazakhstan.
MAIL	Ministry of Agriculture, Irrigation and Land of Afghanistan
NBT	National Bank of Tajikistan
NSC KR	National Statistics Committee of Kyrgyz Republic
OECD	Organisation for Economic Co-operation and Development
SA	Statistics Agency under the President of the Republic of Tajikistan
SSR	Self-Sufficiency Ration
TLSS	Tajik Living Standard Survey
UNDP	United Nation Development Programme
UNICEF	United Nations International Children's Emergency Fund
USSR	The Union of Soviet Socialist Republics
WFP	World Food Program
WHO	World Health Organisation
WTO	World Trade Organisation

1. Introduction

Having experienced an unprecedented transformation of the agriculture sector and reform measures aimed at the institutional reorganization of the sector that was dominated by collective farms, Tajikistan is faced with new challenges of poverty and food insecurity.

Yields have not improved following two decades of agrarian reform and as a consequence, Tajikistan remains food insecure and is increasingly relying on emergency food supplies and commercial food imports for a significant portion of its domestic food requirements. Even with a liberalised agricultural sector, recent statistics indicate that agricultural production and productivity remain inadequate and no progress has been made on the food security front.

The current world economic situation (with its unstable supply and price volatility), has a significant impact on national food security in low-income Central Asian (CA) countries which, in the last decade, have become net importers of food and more dependent on imported grain.

This paper will review the food security dimensions, level of food self sufficiency of low income countries of the region, and recent agricultural developments. It argues for stronger cooperation among countries of the region in the area of food security and the establishment of a monitoring system for cereal crops and other staple foods. The analysis will also attempt to make an empirical assessment of the gender dimension of the food security issue¹.

2. Poverty Dynamics, Food Security and Nutrition

2.1. Poverty Dynamics

Located in the southern part of Central Asia, Tajikistan is geographically divided into four natural zones: northern Tajikistan, where the Tien Shan mountain range is located, central Tajikistan, southern Tajikistan, and western and eastern Tajikistan comprised of the Pamirs. The population and agricultural activities are concentrated in the valleys which make up 7 % of the total territory, and in the western part of the country. The country possesses large deposits of natural resources such as coal, water, gas, gold, silver, salt and marble. Around 7 million hectares (Ha) of land are used in the agricultural sector, most of which are used for pastures. 9.4 % of the land is used for growing crops, of which 70 % is irrigated.

Despite economic growth and macroeconomic stability in Tajikistan in the past few years, poverty and low living standards remain major issues and are a priority of the Government of the Republic of Tajikistan.²

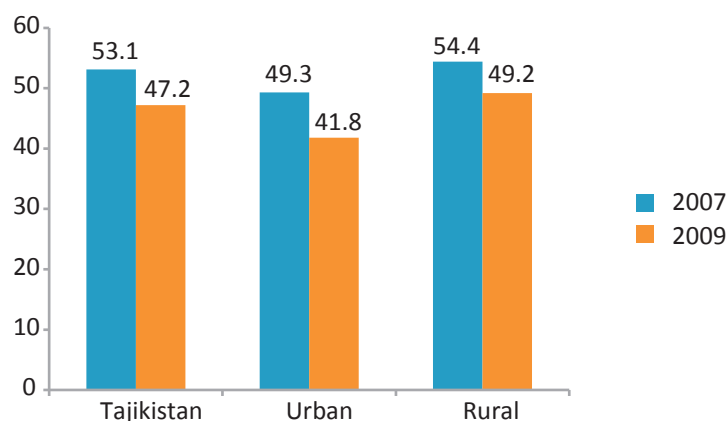
The latest nationwide survey to assess poverty in Tajikistan was conducted in 2009 with the assistance of the World Bank (WB) and UNICEF, based on the consumption of goods and services. Despite an improvement of the standard of living in recent years, poverty remains

¹ The author is grateful to Bohdan Krawchenko, Roman Mogilevskii, Firuz Saidov, Caroline S. Hossein and Ilkhom Abdulloev for valuable comments and suggestions

² Government of the Republic of Tajikistan, *Poverty Reduction Strategy 2010-2012* (Dushanbe: 2010)

widespread. Taking into account international standards of poverty (US\$ 2.15/day, purchasing power parity) and the value of basic household needs, the poverty rate declined between 2007 and 2009. However, in 2009, 47.2 % of the population was classified as poor, and in rural areas almost half the population was poor (Figure 1).

Figure 1. Poverty Rate in Tajikistan (%)

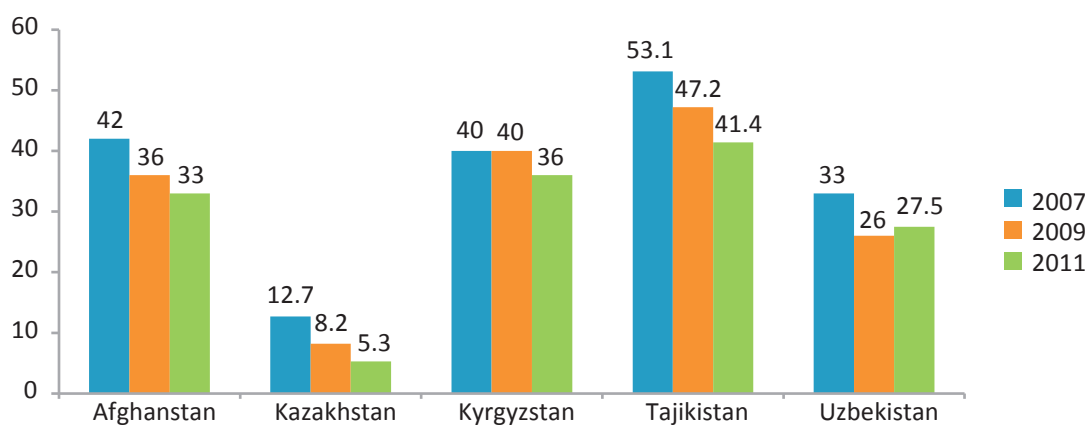


Sources: Tajik Living Standard Survey (TLSS) 2009 adopted from: http://siteresources.worldbank.org/INTTAJIKISTAN/Resources/TJ_Poverty_Note_SummarySept2010Eng.pdf, (accessed November 23, 2012)

According to official statistics in 2011, 41.4 % of the population lived below the poverty rate, indicating a further improvement.³ A number of persistent development issues that cause poverty have to be tackled for the situation to improve: the lack of education, declining levels of school attendance, inadequate access to land and capital and vulnerability of women, and low incomes within the agricultural sector.⁴

Poverty rates decreased gradually in all CA countries between 2007 and 2011 (Figure 2) due to economic growth. In Kazakhstan, poverty is a rather limited phenomenon and does not represent a serious concern, as it does in Afghanistan, Kyrgyzstan, and especially Tajikistan.

Figure 2. Poverty in Central Asia (%)



Sources: Agency for Statistics of the Republic of Kazakhstan. (KSA), 2012b, Data for Afghanistan is estimated based on <http://data.worldbank.org/country/afghanistan> (accessed on December 2, 2012)

³ Statistics Agency under the President of the Republic of Tajikistan, (2012b)

⁴ Government of the Republic of Tajikistan (2010)

2.2. Food Security

The term food security is used to describe the situation when a country is able to adequately feed its population on a national or regional level. The Law of the Republic of Tajikistan defines food security as a situation in the economy when the state ensures the physical accessibility of sufficient food through domestic production to guarantee active and healthy life and demographic growth. The conventional definition for food security at the macro level, that is relevant to developing countries, is “A situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life.”⁵ In the context of self-sufficiency or protectionism, the term is used in developed countries to describe a situation where a country ‘discourages opening the domestic market to foreign agricultural products on the principle that a country must be as self-sufficient as possible for its basic dietary needs.’⁶

Food security comes under threat, especially in times of poor harvests, drastic climate shocks, global prices hikes and unstable food supply. At the household level, food security depends on factors that are tied to various forms of entitlement, and links between internal and external markets. Food security has a strong relationship to poverty, since it is not a merely a matter of supply, but also a function of purchasing power and income.⁷ According to Francesco Burchi and Pasquale De Muro, there are five approaches to food security: food availability, income-based, basic needs, entitlement, and sustainable livelihoods.⁸ This paper will focus on the first approach and analyse the availability of food on a sustainable basis at the national level, which depends on the level and growth of food production and adequate capacity to import food.

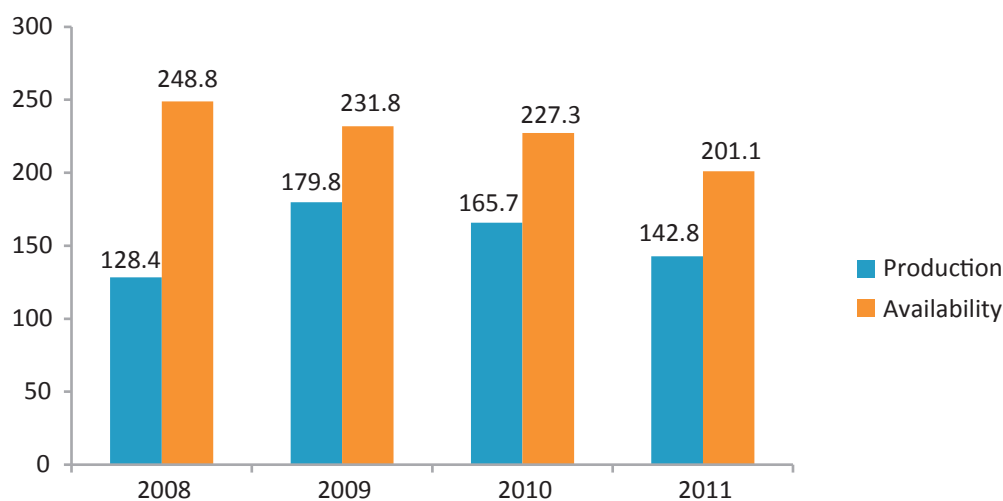
Food security is ensured primarily by domestic production, limiting the risk of dependence on the world market and encouraging the optimal use of the potential of agriculture. This, of course, does not preclude the import and export of agricultural produce. In Tajikistan, per capita food availability has declined in largely because grain production was down by 20 % on a per capita basis in 2011 compared to 2008. Imports of cereal grain averaged around 464,000 tons in the same period. However, since the population grew by about 182.3 thousand people from 2008 to 2011, the ratio of grain imports per capita diminished in this period.

⁵ Food and Agriculture Organization (FAO), *The State of Food Insecurity in the World 2001* (Rome: FAO, 2002)

⁶ Organisation for Economic Co-operation and Development (OECD). *OECD Glossary of Statistical Terms: Food Security*. <http://stats.oecd.org/glossary/detail.asp?ID=5006> (accessed Nov 19, 2012)

⁷ Amartya Sen. “Ingredients of famine analysis: Availability and entitlements.” *The Quarterly Journal of Economics*, 96, no.3 (August,1981).

⁸ Francesco Burchi and Pasquale De Muro, “A Human Development and Capability Approach to Food Security: Conceptual Framework and Informational Basis,” *Working Paper 2012-009 Regional Bureau for Africa*. (United Nations Development Programme, 2012).

Figure 3. Grain availability in Tajikistan (kg per capita)

Source: Author's calculation based on data from Statistics Agency under the President of the Republic of Tajikistan (SA), 2012a.

Note: Availability = Production + imports

2.3. Food Supply and Nutritional Status

Food consumption is a variable used for measuring and analysing the food situation in a country or region and is expressed in kilocalories (k/calories). The average food availability in Tajikistan was 1,918 k/calories per capita per day in 2000, which is 12.8 % below the World Health Organisation (WHO) recommended minimum of 2,200 k/calories per day. From 2000 to 2009, food consumption improved and exceeded the recommended minimum nutrition rate, but it declined by 2012 to below the recommended level (Table 1). The data indicates that while a relatively small proportion of food derived from animals is being consumed, this proportion in fat and protein being consumed, have increased over time.

Table 1. Per capita per day nutritional values and origin of food consumed in Tajikistan (selected years)

	Total Calories (k/calories)	Protein (grams)	Of animal origin (grams)	Deviation from recomm. norm (100 grams)	Fat (grams)	Of animal origin (grams)	Deviation from recomm. norm (100 grams)	Carbohydrate, grams	Deviation from recomm. norm (400 grams)
2000	1918	45.1	6.5	54.9 %	39.8	7.4	60.2 %	335.7	16.1 %
2006	2219	50.4	7.1	49.6 %	51	9.2	49 %	381.4	4.7 %
2009	2246	51.4	7.7	48.6 %	54.8	9.6	45.2 %	382.5	4.4 %
2012	2164	50.58	8.8	49.4 %	55	11.18	45 %	362.72	9.3 %

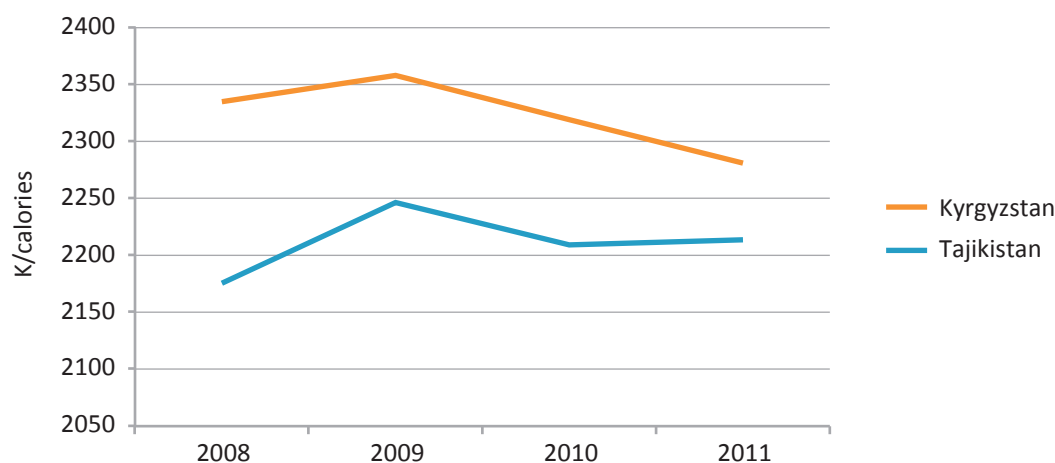
Source: Author's calculation based on data from SA, 2012a and 2012b.

Norms of the minimum dietary energy requirement for the population of Tajikistan has been a difficult issue, even during the Soviet period. Food consumption requirements vary in Tajik-

istan due to the diversity of its geography and climate.⁹ People living in mountainous areas require a higher caloric intake than those living in valleys. The Nutrition Institute of the Academy of Medical Sciences of the USSR recommended two options of per capita food consumption norms for Tajikistan¹⁰. The first was aimed at ensuring the full physiological needs for proteins, fats and carbohydrates of animal and vegetable origin, and vitamins, for a total intake of 2800 k/calories per day. The second established minimal standards for the normal functioning of the human body with a smaller daily intake of 2400 k/calories. The issue is still unresolved and no formal decision has been taken by the Tajik authorities to clearly determine food calorie consumption standards. Politician, nutritionists and statisticians still use Soviet standards which do not necessarily represent actual consumption patterns and food culture.

In neighboring Kyrgyzstan, the nutritional situation was better than that of Tajikistan from 2008 to 2012, but still does not meet WHO norms. It is worth noting that both countries are far below the average levels of Eastern Europe and Commonwealth of Independent States (CIS) countries and reaching the World Health Organization's 2015 forecasted target of 3060 kilocalories, per capita per day remains a significant challenge.¹¹

Figure 4. Caloric value of food in Kyrgyzstan and Tajikistan (k/calories per day per capita)



Source: Food security statistics from SA (04/2008; 04/2010; 04/2011), and National Statistics Committee of Kyrgyz Republic (NSC KR, 2011).

Note: WHO minimum recommended rate is 2200 k/calories per day per capita

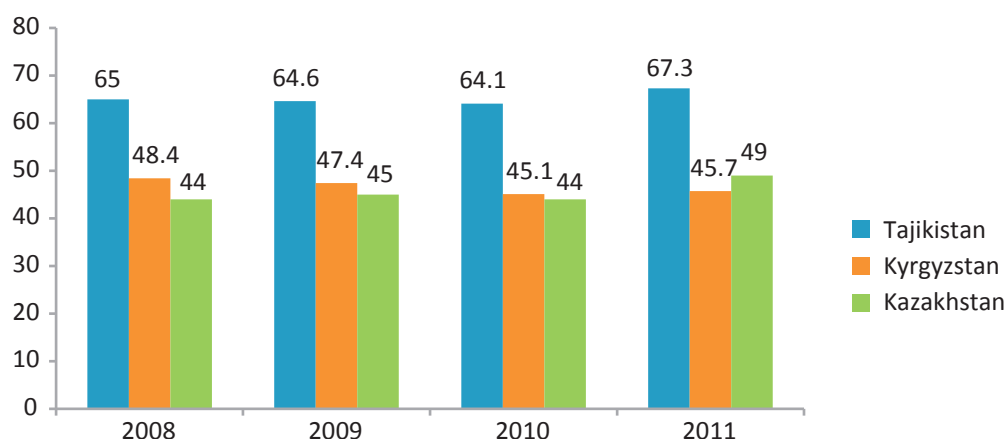
2.4. Food Consumption Patterns

Households in Tajikistan allocate a higher proportion of their expenditure on food consumption than their CA neighbors; in Tajikistan, the average household allocates over two-thirds of expenditures on food staples. This is significantly higher than in Kyrgyzstan and Kazakhstan (See Figure 5).

⁹ Gulmahmad Valimuhamadkhon, *Rol' selskogo khozyastva v prodovolstvennom obespechenii Pamira* (Dushanbe: Donish Printing House, 2007).

¹⁰ Ibid.

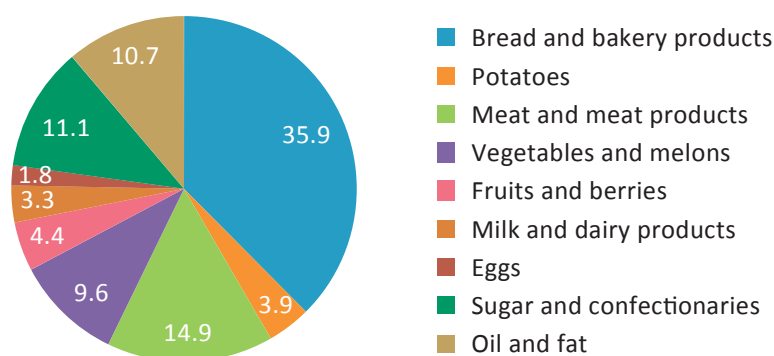
¹¹ World Health Organization (WHO). "Diet, Nutrition and Prevention of Chronic Diseases." *WHO Technical Report Series 916. Report of a Joint WHO/FAO Expert Consultation*. Geneva: WHO, 2003.

Figure 5. Share of consumer expenditures for food in Central Asia (%)

Sources: KSA, 2012c; NSC KR, 2012; SA, 2012 e.

The deterioration of the food security in the country is exacerbated by the growing income differentiation of the population. The ratio of the income of the richest 10 % of the population in comparison to the income of the poorest 10 % was 14 times higher in 2011 than in 2010. The ratio gap was 20.3 times higher in the rural population.¹²

Bread and cereal account for the biggest share of total food spending in Tajikistan. On average, household spending on bread amounts to almost 40 % of the total. Meat products, oil and fat, and sugar are the next highest contributors to total family spending. Spending on eggs, dairy products and fish is insignificant (Figure 6).

Figure 6. The structure of food expenditure in Tajikistan (% of total food expenditure, 2011)

Source: SA, 2012 e.

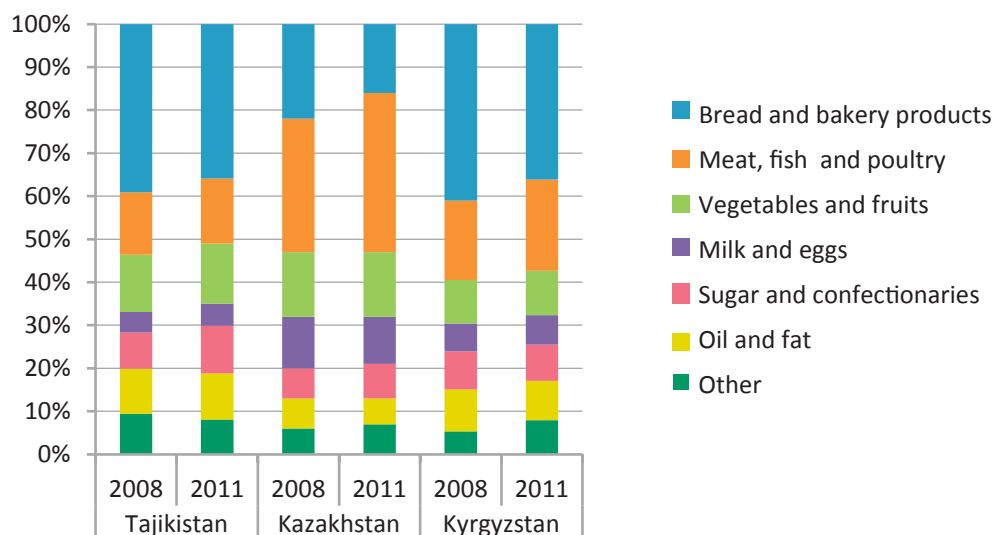
The pattern of Tajik household spending on food (with the exception of meat products) is typical of low-income countries.¹³ Household spending on meat and dairy products increases with gradual improvements in income and well-being of the population. Data on food con-

¹² Statistics Agency under the President of the Republic of Tajikistan, (2012a).

¹³ See for example, John Martin, "The Myth of the Consumption-Oriented Economy and the Rise of the Desiring Subject." *Theory and Society: Renewal and Critique in Social Theory*, vol. 28, Netherlands, 1999.

sumption patterns in Kazakhstan, where economic realities are approaching those of higher income countries, demonstrates this (Figure 7).

Figure 7. Staple Food Expenditure in Kazakhstan, Kyrgyzstan and Tajikistan (%of total food expenses)



Sources: Food security statistics from SA (04/2008; 04/2011), NSC KR (2011), and KSA (2012b).

Ample quantities of food are not the only concern when it comes to food security. To avoid and address the public health problems associated with malnutrition, healthy diets must be sufficient, not just in calories, but also in the balance of macronutrients, vitamins and minerals. A more sophisticated understanding of the relationship between diet and health prioritizes health as a key driver of future agricultural planning and production.

An assessment of the level of accessibility to food is done by comparing the actual amount of consumption of a country with consumption standards (used as a physiological rate of consumption of food per average citizen of a country). Table 2, depicting the main staple foods consumed in Tajikistan show excessive use of oil and fat. In 2011, the actual consumption was less than official standards for most of food items, with the exception of oils and fats. The data points to the seriousness of the problem of physical access and income availability for food spending.

Table 2. Consumption of staple foods per capita in Tajikistan (kg per year)

Staple food	Standard consumption	physiological norm of consumption	Actual consumption		
			in 2011	in % to standard	in % to physiological norm
Bread products	111	183	159.6	143.78	87
Meat, fish and poultry	42.3	45	12	28.37	26.7
Vegetables and melons	90	142	73.2	81.33	51.5
Fruits and berries	32	78	39.6	123.75	50.8

Staple food	Standard consumption	physiological norm of consumption	Actual consumption		
			in 2011	in % to standard	in % to physiological norm
Eggs (per piece)	142	220	48	33.80	21.8
Milk	228.5	183	54	23.63	29.5
Sugar	18	37	12	66.67	32.4
Oils and fats	9	9	14.4	160.00	160
Potatoes	95	110	33.6	35.37	30.6
Fish and seafood	8.4	18.2	0.24	2.86	1.3

Sources: Author's calculation based on food security statistics from SA, 2012a.

Demand for food in Central Asia is based on several factors. The key demand drivers include growth in income, population expansion, and urbanisation. A rise in income results to higher purchasing power. From 2008 to 2011, as household income grew, food expenditure also expanded. The continuing growth of the population is also a major driver for the growing demand for food in Central Asia. The population of Tajikistan expanded by 1.7 % annually from 7.4 million in 2008 to 7.8 million in 2011. In Kyrgyzstan, between 2008-2011 the annual growth of the population was 1.23 % and in Kazakhstan, it was 1.73%. (Table 3). Intensifying urbanisation also propelled and impacted food demand. Urban populations typically have higher incomes and thus, tend to spend more on food.

Table 3. Real Wage and Demographic Indicators Impacting Demand for Food

	Average Annual Real Wage Increase (2008-2011, %)	Average annual Population Growth (2008-2011, %)	Average Annual Urban Population Growth (2008-2011, %)
Kazakhstan	107.1	1.73	2.5
Kyrgyzstan	111.6	1.23	1
Tajikistan	115.8	1.7	2.1

Sources: KSA, 2012c), NSC KR, 2012, and SA, 2012. <http://stat.tj/ru/database/socio-demographic-sector> (date accessed December 22, 2012)

3. Agricultural Development, Food Availability and Self-Sufficiency

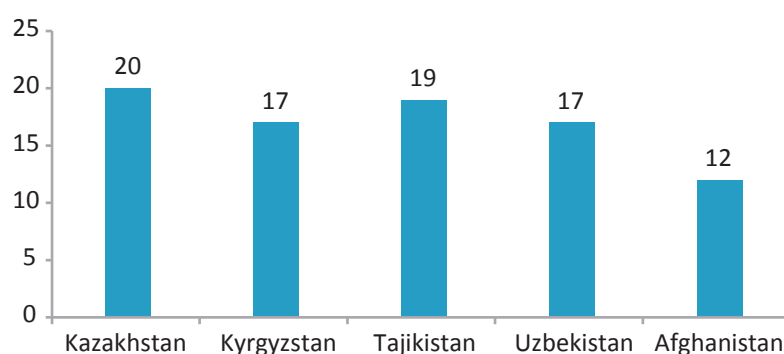
Tajikistan, Afghanistan and Kyrgyzstan (countries with the lowest domestically produced goods per capita ratio¹⁴ and highest level of poverty rate in Central Asia) in comparison to Uzbekistan and Kazakhstan are exposed to vulnerability to increases in international food prices affecting food supply and food security of their populations. This chapter reviews agricultural policies/programs implemented to improve food availability, as well as food and grain balance sheets (with greater focus on Tajikistan).

¹⁴ Roman Mogilevskii, "Trends and Patterns in Foreign Trade of Central Asian Countries," *Institute of Public Policy and Administration (IPPA) Working Paper No.1* (Bishkek: University of Central Asia, 2012).

3.1. Tajikistan

The agricultural sector of Tajikistan during the Soviet era was organised monolithically with the state and party apparatus acting as the single management entity. In fact, the economy itself was a single establishment, controlled by a state bureaucracy. Monetary and budgetary relations played a subordinate role. Thus, at a time when the state structures and the economy were in fact a single legal entity, the bulk of the regulatory framework existed in the form of joint resolutions and economic plans of the Council of Ministers. Following the dissolution of the USSR and the establishment of an independent Tajikistan in 1991, the country experienced a prolonged transformation of the agricultural sector. The country's Constitution does not stipulate outright private ownership of land, although land code legislation does foresee life-long and inheritable land use rights by citizens. Until 1995, there were 597 state and collective farms, constituting 93 % of cultivated farm land in the country. The cotton crop accounted for some 40 % of agricultural production, with livestock making up 30 %, and food crops making up the balance of 30 %. Despite enjoying the comparative advantage of having abundant water resources, hydropower, favorable climate conditions and low labor costs, Tajikistan has remained a net importer of grain cereal.

Figure 8. Share of arable land of total agricultural land (average 1980-2004, %)



Sources: Zvi Lerman and David Sedik (2008b) ; *Author's calculations for Afghanistan are based on share of arable land in percentage of total area of the country based on data from <http://www.factfish.com/statistic-country/afghanistan/arable%20land%20of%20land%20area> (date accessed: December 12, 2012)

In the mid-1990s, 75,000 Ha were designated for land use ownership for private farming by Presidential Decrees.¹⁵ This action was critical in solving the most urgent problems during the most difficult years of the reform given severe unemployment, lack of stable income opportunities. One third of households incurred debt to purchase staple foods and 80% of incomes were spent on food.¹⁶ The measures were crucial because (i) They attracted a significant portion of the unemployed rural population to farming, and (ii) They provided that population with a means to accessing essential staple foods, especially bread products. In the late 1990s, the Government launched an initiative to privatize over 100 former collective farms into dekhkan farms, despite weak and unprepared administrative and land registration services and proce-

¹⁵ According to two separate Presidential Decrees, 50,000 Ha in 1995 and 25,000 Ha in 1997 were allocated for private farming

¹⁶ Jane Falkingham, "A Profile of Poverty in Tajikistan." *Case Paper 39* (London: London School of Economics, 2000).

dures. A dekhkan farm is a form of freestanding economic entity acting “as an entrepreneur based on the personal work of one person, one family or group of individuals, based on the land and other property belonging to its members”¹⁷ and enjoying full freedom of what to seed on a land spot managed by the farms. However, some elements of farm reforming package became burdensome and were accompanied by on-going transfer of debts of the former state collective farms to the newly created dekhkan farms. Nevertheless, the reorganization of the collective farms into structures such as joint stock companies, lease enterprises, and dekhkan farms was the hallmark of the first phase of structural reform of the agricultural sector.

The second wave of the sector’s reorganization took place in from 2000 to 2005 and was accompanied by lack of transparent land use right procedures, poor quality advisory services to farmers, numerous cases of land distribution procedure violations, and poor knowledge of farmers of their new rights. Nonetheless, agricultural production stabilized and output growth was recorded. However, shortages of staple foods persisted, and wheat and flour had to be imported (Table 4).

Table 4. Tajikistan’s Imports of Wheat and Flour by Total Value (\$US) and Country (2000-2005, %)

	2000	2001	2002	2003	2004	2005
Total (in ‘000 US\$)	44,822	37,686	35,875	32,288	49,233	76,176
Kazakhstan	97.1	91.8	95.6	91.7	77.3	85.6
Kyrgyzstan	0.1	0.4	0.5	0.5	0.0	0.1
Russia	2.1	6.7	3.4	3.2	1.1	1.5
Uzbekistan	0.6	0.8	0.5	4.4	21.4	12.7

Source: SA, 2006.

In 2000, the Government of Tajikistan adopted its Mid-Term Programme for Agriculture Sector Bailout and Strategic Development to 2005, but the initiative was a failure. The de-monopolization of the cotton sector, combined with a lack of sufficient competition in cotton processing operations, price and market liberalisation resulted in a contraction of areas growing cotton. The initial assessment of the social consequences of the agricultural transformation processes showed that non-cotton farmers were better off and experienced output growth as a result of lack of vested interests in non-cotton farming.¹⁸ Routine interventions by regional authorities, the de facto monopsony of ginning subsector players,¹⁹ payment delays and unreasonable terms by financial intermediaries, and a shortage of quality seeds, fertilisers and storage facilities caused a sharp decline of raw cotton yields in the early 2000s. The yields in 2000 and 2005 were only 51 % and 69 % respectively of the 1991 yield.²⁰ Much of the risks under future contracts were shifted to cotton producers and, due to the decline in cotton

¹⁷ The Law of the Republic of Tajikistan “On Dekhkan Farms” (adopted on 19.05.2009)

¹⁸ World Bank, “Republic of Tajikistan. Poverty Assessment Update,” *Report 30853-TJ* (Washington D.C: World Bank, 2005).

¹⁹ Sarosh Sattar and Shahib Mohib, “Tajikistan: Cotton Farmland Privatization” in *Poverty and social Impact Analysis of Reforms: Lessons and Examples from Implementation*, ed. A. Coudouel, Anis A. Dani and Stefano Paternostro, (Washington D.C: World Bank, 2006).

²⁰ Statistics Agency under the President of the Republic of Tajikistan. *Tadzhikistan: 15 Let Gosudarstvennoy Nezavisimosti. Statisticheskij sbornik*. Dushanbe, (2006)

prices, they accumulated shocking levels of debt to cotton and non-cotton investors. Lerman and Zelik attribute the heavy debt of this sector to the “inability of the farms to make a profit under current conditions and continued lending by the banks to cotton producers regardless of reduced payment capacity and lack of credit-worthiness.”²¹

At the institutional level, cotton farm debt has created obstacles for further farm reorganisation. Members of dekhkan farms and agricultural enterprises were reluctant to reorganise or establish independent farms for fear of inheriting liability for a portion of the collective debt, in the case of leaving collective dekhkan farms. The Tajik authorities continuously passed resolutions, decrees and programmes to tackle the issue. In 2007, the Action Plan for Measures for Cotton Debt Resolution in Tajikistan for 2007-2009,²² stressed the need to end on-going interventions by regional administrative authorities in decisions by dekhkan farmers on general planning, seeding campaigns, procurement of inputs, and cotton sales.

Nevertheless, the vicious circle of the cotton sector financing crisis reached an unprecedented level of debt,²³ revealing incredible misreporting of the National Bank of Tajikistan (NBT) to the International Monetary Fund²⁴ and forcing the Government to officially write-off the cotton debt of farms via a special Government Resolution in 2009.²⁵

Table 5. Patterns of Change in Tajikistan’s Agricultural Sector (1990-2007)

Variable	1990-97	1997-2007	2007 relative to 1991
Agricultural output	Decline	Recovery	Back to 1991 level OK
Livestock	Decline	Recovery	Inventories 20% higher than 1991 level
Agricultural labor	Increase	Increase	60% higher than 1991
Arable land	Stable	Stable	Unchanged
Irrigation	Stable	Stable	Unchanged
Farm machinery	Collapse	Collapse	50% of 1991 for tractors; 60% for grain combines; 20% for cotton combines
Fertilizer	Apparent decline	Stable	Apparently less than 1991

Adapted from: Zvi Lerman and David Sedik, “The Economic Effects of Land Reform in Tajikistan,” Policy Studies on Rural Transition, 2008-1 (Budapest: Food and Agriculture Organization of the United Nations, 2008).

From 2006 to 2011, the average amount of arable land in Tajikistan was 875,000 Ha annually. Since reforms have extended freedom to farmers to choose what they grow, there have been dramatic changes in the crop cultivation. In the twenty year period since independence, land used for cotton cultivation has decreased to 35 % of the total cultivated area (Figure 9). In the same period, land devoted to wheat production more than doubled, highlighting efforts to improve the availability of food for the population. Another significant development is a 40 % drop in land used to cultivate fodder or feed crops.

²¹ Zvi Lerman and David Zelik, “The Economic Effects of Land Reform in Central Asia: Case of Tajikistan,” *Discussion Paper 16.08* (Jerusalem: Hebrew University of Jerusalem, 2008).

²² Government of the Republic of Tajikistan Resolution No.111 (March 5, 2007)

²³ Cotton debt in 2008 was 200% of the Level of Gross Reserves of the NBT.

²⁴ Ernst and Young. *Special Audit of National Bank of Tajikistan, 2009*, <http://ayina.files.wordpress.com/2009/04/nbt1.pdf> (date accessed: December, 2012)

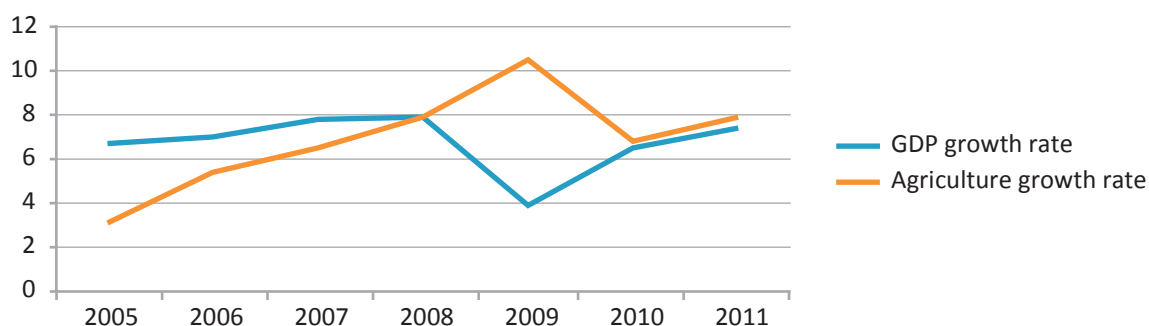
²⁵ Government of the Republic of Tajikistan Resolution No.719 (December 30, 2009)

Figure 9. Cultivated Areas by Type of Crops in Tajikistan (Ha)

Source: SA, 2012c.

Tajikistan's economic growth averaged an impressive 7.4 % between 2005 and 2008, but slowed down significantly to 5.9 % from 2009 to 2011 due to the global crisis. However, the agricultural sector of the economy averaged a 5.7 % growth rate between 2005 and 2008, and recorded strong growth, averaging 8.4 % per year from 2009 to 2011, reflecting an overall tendency to recover from the severe slump in agricultural production in the 1990s (Figure 10). The sector accounts for 48 % of the active labour force and 23 % of export earnings of the country.²⁶ However, the average salary in the agricultural sector is only 37 % of the average salary of the non-agricultural sector.²⁷

Tajikistan does not apply any measures prohibited by the World Trade Organisation (WTO) Agreement on Agriculture. There are no quantitative import restrictions, minimum import prices, import licensing, and nontariff measures. At the same time, the Government is not extending export subsidies for agricultural products that were in place in the early 2000s. Export credits and export guarantee schemes are also currently not in use.

Figure 10. Tajikistan's GDP and Agricultural Growth Rates (annual %)

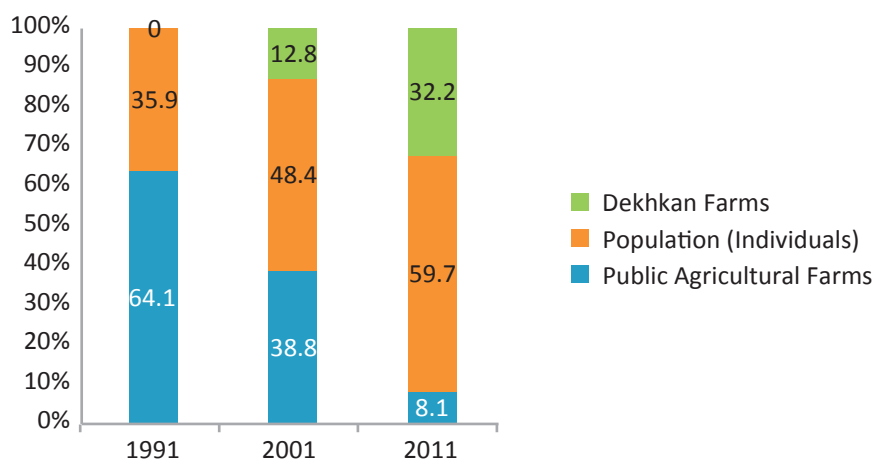
Source: SA, 2012c.

²⁶ Statistics Agency under the President of the Republic of Tajikistan, (2012d)

²⁷ Statistics Agency under the President of the Republic of Tajikistan, (2012a)

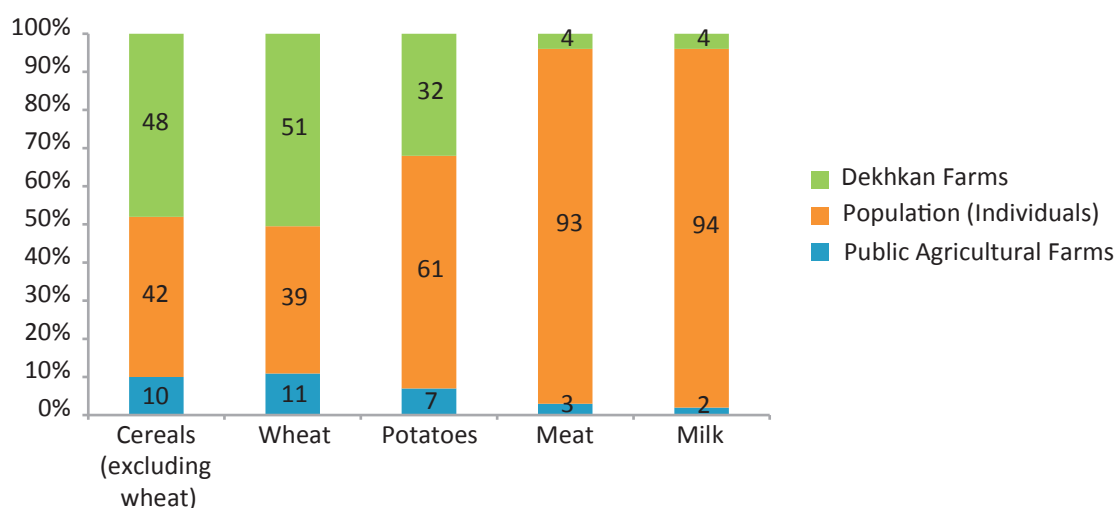
Land reforms and especially farm privatization and land ownership reorganization initiatives resulted in a dramatic recovery of agricultural production in Tajikistan. In 2001, individual farmers and dekhkan farms already accounted for 61 % of the total output of the sector (see Figure 11). Recently, cereal production growth has been dominated by dekhkan farms and individual farmers. Dekhkan farms accounted for half of wheat output in 2011 (see Figure 12).

Figure 11. Gross Agricultural Output by Types of Producers in Tajikistan (%)



Source: SA, 2012c.

Figure 12. Production of Selected Staple Foods in Tajikistan by Types of Producers (2011, %)



Source: SA, 2012c.

However, the recovery of output and productivity needs to be treated with caution. Although there is some evidence that agriculture policy reforms Tajikistan in late 1990s have been associated with increases in land and labour productivity at an aggregate level, much of the increase is due to shifts in land ownership, rather than the intensification

of existing farming. Lerman and Sedik claim that the household sector significantly improved its productivity following the agrarian reforms, in comparison to dekhkan farms and corporate farms, urging the authorities to allocate greater agricultural area to individual farmers.²⁸ Productivity analysis²⁹ shows that 55 % of the growth of agriculture output growth is attributable to an increase in the land area and 45 % because of higher productivity. Productivity improvement could be achieved via investments and agricultural development conditions encouraging competitiveness even amongst domestic and foreign farmers (see Box 1).

Box 1. Productivity Growth of Chinese Farmers in Tajikistan

In August 2011, the Ministries of Agriculture of the Republic of Tajikistan and the People's Republic of China signed a Memorandum of Understanding for agricultural cooperation. The two agreed to cooperate and exchange practical experience in agriculture, as well as build training capacity and establish joint agricultural enterprises.

In 2012, the Memorandum's implementation is under way and noticeable results have been achieved. In Yavan and Rumi Districts of Khatlon Oblast, *Szinnyan Inhai* LLC has sown cotton seeds (Inshan-2 type) and maize seeds (Zsinyan types). The average yield for Khatlon Oblast by Tajik farmers in 2011 was as follows: 21.5 hundredweight of cotton per Ha and 38.5 hundredweight of maize per Ha. Preliminary analysis confirms that Chinese farmers achieved substantial results in Tajikistan. Their productivity was recorded as follows: in Yavan District: 56 hundredweight of cotton per Ha and 83 hundredweight of maize per Ha; in Rumi District: 35 hundredweight of cotton per Ha and 51 hundredweight of maize per Ha. This is of particular striking outcome, given that that land spots allocated to Chinese farmers were unusable and of poor ameliorative state. Secondly, Tajik authorities' clearly pursue of transfer of technology and farming techniques, by Chinese farmers, pays off.

Historically, livestock production has been less important in Tajikistan than in neighboring CA states.³⁰ In 1991 the sector accounted for 32 % of total gross agricultural production and, following agricultural reforms, it has not fully recovered. Livestock production made up 26 % in 2001 and 27 % in 2011 of agricultural production. Livestock production (dairy products, meat and meat products) is exclusively dominated by individual farmers.

Tajikistan's Food Balance Sheet

The status of food security is generally analyzed and measured by examining supplies of food balance sheets. The sheet includes the main staple foods consumed in the country and is a useful tool to determine the rate of self-sufficiency.³¹ A Balance Sheet for Tajikistan is compiled on quarterly basis for the Food Security Bulletin by Statistics Agency of Tajikistan (see Table 6).

²⁸ Zvi Lerman and David Sedik, "The Economic Effects of Land Reform in Tajikistan," *Policy Studies on Rural Transition, 2008-1* (Budapest: Food and Agriculture Organization of the United Nations, 2008).

²⁹ Zvi Lerman and David Zelik, "Farm Debt in Transition Countries: Lessons for Tajikistan," *Selected Paper, Agricultural & Applied Economics Association (AAEA), AAEA & ACCI Joint Annual Meeting*, (Milwaukee, Wisconsin, 2009).

³⁰ Zvi Lerman and David Sedik, "The Economic Effects of Land Reform in Tajikistan," (2008).

³¹ Food and Agriculture Organization, (Rome: FAO, 2002)

Table 6. Tajikistan's Food Balance Sheet (2011, thousand tons)

		Bread and bread products	Meat and Meat Products	Vegetable oil	Sugar and confectionaries	Milk and dairy products	Eggs, million	Potatoes
1	Stock at the beginning of period	258.1	225	6.9	169.9	670.5	11.6	263.2
2	Domestic Production	1098	75.4	2.3	-	696	254.8	863
3	Imports	471	66.5	88	126.1	12.1	63.5	12.6
4	Exports	0.2	-	-	-	-	-	-
5	Availability for consumption	1277	84.25	85.6	90	479	292.4	251
6	Stock at the end of period	365.3	282.6	11.6	205.8	869.3	36.1	712.8
7	Import Dependency Ratio (%) ³⁴	30.0	46.9	97.5	126.1	1.7	20.0	1.4
8	Self-Sufficiency Ratio (%) ³⁵	70.0	53.1	2.5	-	98.3	80.0	98.6

Source: SA, 2012a.

Table 6 shows that in 2011, Tajikistan's self-sufficiency ratio for potatoes, dairy products and eggs was above the food security threshold adopted by the legislation.³⁴ According to Article 16 of the 2010 Law of Tajikistan on Food Security, the food security is defined as a situation when production of main staple food items in the amount of 80% from annual consumption of the population are produced domestically. The production of wheat is nearing the threshold, although the quality of the wheat remains of low and it is not fortified with special additives and minerals, compared to wheat imported from Kazakhstan. There is a high level of dependency on imports to satisfy needs for meat and meat products. The consumption of vegetable oil (a major dietary item) exceeds the recommended nutritional norms and is almost entirely comprised of imports. Domestic production capacity of oil is very low and is mainly constitutes in cotton-seeds oil. According to State Unitary Enterprise "Khurokvori"³⁵ only one-fourth share of the domestically demand is produced by local companies³⁶.

In summary, Tajikistan is not self-sufficient when it comes to food staples. Self-reliance implies that a country "should be able to acquire the food it needs, i.e. to export goods to earn enough to pay for food imports."³⁷ Tajikistan remains at risks for export revenue sustainability due to a lack of diversification of export-earning products in recent years.

³² $IDR = Imports / (Production + Imports - Exports) \times 100$

³³ $SSR = Production / (Production + Imports - Exports) \times 100$

³⁴ The Law of Tajikistan On Food Security adopted in December 2010

³⁵ "Khurokvori" is a state entity regulating production licensing

³⁶ FAO, "Procuring Wheat Flour, Pulses and Vegetable Oil in Tajikistan", *Procuring local foods in Tajikistan*, FAO Office In Tajikistan (2011)

³⁷ Food and Agriculture Organization (FAO), *Trade Reforms and Food Security. Conceptualizing the linkages* (Rome: FAO, 2003).

Gender Dimension of Land Access

Data from the 2007 World Bank Standard of Living Measurement Survey for Tajikistan provides detailed information about the heads of households, information on food security and information about households and their members. The survey is randomly sampled and country representative.

Access to land is associated with the improvement of livelihoods and leads to a decrease in the food insecurity according to the Survey. It creates employment opportunities twice higher for women rather than for men.³⁸ Partially it is explained by on-going strong migration of male workforce population to Russian Federation.

Helen Shahriari et al (2009) finds no significant gender differences or disadvantages in regard to women's access to irrigated land. Share of irrigated land in total household lands in three regions of the country (Khatlon, Sogd and Gorno Badakhsha (GBO)) almost equally distributed amongst households headed by women and men. However, female-headed households received, by far smaller fraction of land allocated by above mentioned Presidential Decrees.

After substantial extension of irrigation coverage during the Soviet era, in 1990 the share of irrigated land in total arable land was 70 percent. Today, virtually all arable land (more than 700 thousand ha.) can be considered irrigated, because since independence, the area of arable land has declined by almost 200 thousand ha., while irrigated area remained stagnant (Lerman 2008: 4). As seen in Table 20, the share of irrigated land in total privately used land reflects these realities. While regional differences in the share of irrigated land exist, gender differences are low. Men's ratio of total irrigated land is relatively lower in the city of Dushanbe (where less than five percent of households are engaged in agricultural production) and in the RRP. Interestingly Khatlon, the oblast with extremely high irrigation demand for cotton production, lacks private irrigation. Most likely, cotton irrigation crowds out irrigation for other crops. In parts of Khatlon, local governments (khukumats) force farmers to produce cotton on at least 80 percent of their land. As cotton production requires irrigation, virtually all irrigated land must be dedicated to cotton production.

Farmers who are more entrepreneurial and productive rent more land for farming. People who also rent out their land have less probability of not having enough food, since they in addition to their regular income from work receive an income from rent.³⁹

The analysis of the 2007 TLSS shows that families with more adults and elders might have more work earnings. Families with larger number of members also might imply that these families have sufficient amount of labor to support their household production. The reverse relationship is also possible in a case of the number of children. Families that have sufficient food and resources can «afford» more children.

³⁸ Shemyakina, Olga, 2011. The Labor Market, Education and Armed Conflict in Tajikistan, Policy Research Working Paper 5738, Washington DC: World Bank, 2011.

³⁹ State Statistics Committee and UNICEF. 2007 Tajikistan Living Standard Survey. Indicators at a Glance. Dushanbe 2009

The important result is that the households where heads are working as self-employed in non-agricultural sectors are more likely to be among those who do not have enough food. Such relationship might be due to the instability of income in such employment. Self-employment in Tajikistan is not associated with the social security scheme. The government do not provide any social benefits in a case of health emergency of working self-employed heads. Furthermore, the income in such employment is not stable implying families' consumption fluctuations.

Interestingly to note, based on the Survey, that the households where heads have a university degree are also more likely of not having enough food, unlike household where heads have degrees from vocational schools. After the collapse of former Soviet Union, the majority of high skilled labor specially trained for Soviet industries was no more needed. Dissolved economic ties between state-owned enterprises in different countries of former Union, as well as their consequent privatization, resulted in the increase in unemployment. Additionally, while the labor market conditions are changing in Tajikistan, the Tajik universities are still «pumping out» graduates without taking into account the current market demand for different qualifications.⁴⁰ Both extra supply of skilled labor and unnecessary qualifications resulted in lower returns to education, and affected incomes of many families in Tajikistan.

Another important result from the Survey concerns decision making on income spending. The estimation results show that households where heads are taking decisions on the household's income spending also do not have enough food (reference group is decisions are made by other members of the household). The head making decisions on income spending might imply that other members in this household do not work and are not financially independent from the head of the household. It should be noted that according to official statistics⁴¹ the percentage of women heading dekhkan farms has decreased from 13.4 in 2006 to 10.3 in 2011 pointing to a severe lack of empowerment of women in the decision-making processes in agriculture.

3.2. Afghanistan

Agriculture is the main economic activity in Afghanistan, accounting for 28 % in GDP in 2011 and employing 80-85 % of the population. The sector's output is dominated by cereal (mainly wheat) and other field crops (barley, maize, rice and pulses) which contribute 77 % of total agricultural GDP.⁴² Livestock production accounts for 14.5 % of the sector's GDP and is an important source of income for the population of Afghanistan. In 2010-11, livestock numbered 40 million heads, a tenfold increase from the 2003 Livestock Census conducted by FAO. The main livestock species are poultry, sheep, goats and cattle. Only an estimated 12 % of the

⁴⁰ Evelyn Ganzglass and Kevin Murphy, "Workforce Competitiveness Assessment in Tajikistan", http://pdf.usaid.gov/pdf_docs/PNADK006.pdf (report accessed on Jan.12, 2013)

⁴¹ Statistics Agency under the President of the Republic of Tajikistan (2012c)

⁴² Outlawed poppy production for opium is not covered in this paper, although it plays a huge role in income generation of the population.

land is arable. Almost half of the country's territory consists of permanent pastures and 40 % is mountainous and not usable for agriculture.

The main agricultural export is raisins. Raisins, together with other dried fruits such as almonds, figs and pistachios, represent 27 % of the total value of Afghanistan's exports. In recent years, the importance of neighbouring Pakistan as a primary destination for agricultural products has diminished although in 2010, it was the second largest importer of Afghan goods.⁴³ The potential to expand trade with CA economies has yet to be tapped because of significant obstacles and constraints due to the security situation, inadequate infrastructure and weak institution capacity.⁴⁴

Wheat milling, the largest agro-based industry in the country consists mainly of small scale water mills (called *asiabs*) and diesel mills. Domestic wheat production is largely processed by this industry.

Table 7. Cereal production in Afghanistan (selected years, thousand tons)

Crop	2003	2007	2010
Wheat	4,362	4,343	4,521
Milled rice	291	425	481
Maize	310	360	285
Barley	410	370	428
Total cereals	5,373	5,498	5,715

Source: Ministry of Agriculture, Irrigation and Land of Afghanistan (MAIL), 2010

Table 8. Cereal Balance Sheet of Afghanistan (2010, thousand tons)

Crop	Requirement					Domestic production	Surplus/Deficit
	Food	Seed	Feed	Loss	Total		
Wheat	4,240	313	--	678	5,232	4,521	-710
Rice	450	22	--	34	506	481	-25
Maize	53	11	178	43	285	285	--
Barley	26	23	315	64	428	428	--
Total	4,769	369	493	819	6,450	5,715	-735

Source: MAIL, 2010.

According to the latest state statistics, Afghanistan is not self-sufficient in all cereal consumed in the country, and imports and donor food aid cover the deficit⁴⁵. However, the Food Security Monitoring System, a joint initiative of the United States Agency for International Develop-

⁴³ Roman Mogilevskii, "Trends and Patterns in Foreign Trade of Central Asian Countries," *Institute of Public Policy and Administration (IPPA) Working Paper No.1* (Bishkek: University of Central Asia, 2012).

⁴⁴ Saeed Parto, Jos Winters, Ehsan Saadat, Mohsin Usyan and Anastasiya Hozyainova, "Afghanistan and Regional Trade: More, or Less, Imports from Central Asia?" *Institute of Public Policy and Administration (IPPA) Working Paper No.3* (Bishkek: University of Central Asia, 2012).

⁴⁵ Islamic Republic of Afghanistan, Ministry of Agriculture, Irrigation and Land. Agriculture Prospect Report. Kabul: Statistics and Marketing Information Office, 2010.

ment (USAID) and the World Food Programme (WFP), reported a bumper cereal harvest in 2012, the best in 35 years. The excellent harvest resulted in price stability for grain products and eased access to primary staple foods of wheat and wheat flour for the Afghan population, except for those living in remote areas bordering Tajikistan.

The donor community is taking steps to build capacity and improve food security in Afghanistan. The WFP is supporting Afghan agrarian authorities to establish a strategic grain reserve with storage facilities to respond to grain market fluctuations in times of surplus or shortfall. Projects such as *Food for assets*, *Food for education and food for training*, and *Assistance to Flour Fortification* are some of measures taken by the donor community to improve food security in Afghanistan⁴⁶. Awareness-raising campaigns and projects are also addressing gender-related development issues, including literacy and vocational skills training among illiterate adults (mostly women), and improving teachers' skills (especially female teachers). Such programs aim to teach proper food utilization and hygiene related issues, whilst causing greater school enrollment, especially for girls and improving capacity to learn.

3.3. Kyrgyzstan

Agriculture contributed 18 % of the GDP of Kyrgyzstan in 2011, providing raw material for industrial sector of the economy and staple food for the population. The sector remains key to achieving food security and employment of the country. It employs 30.7 % of labour. The value of food exports (grapes, beans, animal hides, beef products, cotton lint and apricots) represent nearly 9 % of total exports. Food imports (wheat, wheat flour, sugar, non-alcoholic beverages and chicken meat) made up nearly 13 % of the total volume of imports in 2011.⁴⁷

As in other former Soviet republics, the agriculture sector in Kyrgyzstan experienced reforms following independence. The Constitution of new republic anticipated reforms to encourage the private ownership of land and as a result of these reforms, land was been transferred to individual farmers. Today, over 90 % of agricultural output is produced by the private sector. The agricultural sector of the economy suffers from limited managerial skills in rural areas, the absence of new technologies, the dominance of the older methods of farming, and the lack of adequate financing for high quality seeds, technical and other resources.

Livestock husbandry is developed across the country and is a key agricultural activity. Dairy and meat production, and cattle and horse breeding are the main industries. Wide-spread sheep breeding generates considerable wool production.

⁴⁶ See for an instance information on donor operations in Afghanistan at <http://www.wfp.org/countries/afghanistan/operations> (date accessed on 21.12.2012) or at <http://www.wvfoodresourcesworkshop.com/Images/mmDocument/Afghanistan%20USDA%20Brochure.pdf> (date accessed 19.01.2013)

⁴⁷ National Statistics Committee of Kyrgyz Republic (NSC KR), *Kyrgyzstan v tsifrakh. Statistichkiy sbornik* (Bishkek: NSC KR, 2012c).

Kyrgyzstan's Self-Sufficiency Ratio for main staple foods was at a moderate level in 2011 (see Table 9). However, high fuel costs, political tensions with the main importers of Kyrgyz dairy products, and the migration of the rural workforce to urban areas due low agriculture profitability all make Kyrgyzstan less food secure, fostering a greater dependence on food imports.⁴⁸

Table 9. Kyrgyzstan's Food Balance Sheet (2011, thousands tons)

		Bread Products in grain	Meat and Meat Products	Vegetable Oil	Sugar and confectionary	Milk and dairy products	Eggs, million	Potatoes
1	Stock at the beginning of year period	1453.8	4.6	36	15.9	38.6	25.4	712.3
2	Domestic Production	1580.7	190.4	15.6	17.0	1358.1	392.8	1379.2
3	Imports	532	85	37.1	91.3	24.1	58.7	0.7
4	Exports	95.5	71.3	-	1.1	126.7	-	263.3
5	Availability for consumption	999.3	203.6	62.3	112.6	1120.5	432.1	517.8
6	Stock at the end of year period	1295.6	4.8	26.4	10.4	39.5	36.3	733.4
7	Self-Sufficiency Ratio (%)	78.4	93.2	29.6	15.9-	108.2	87.0	123.5

Source: NSC KR, 2012b.

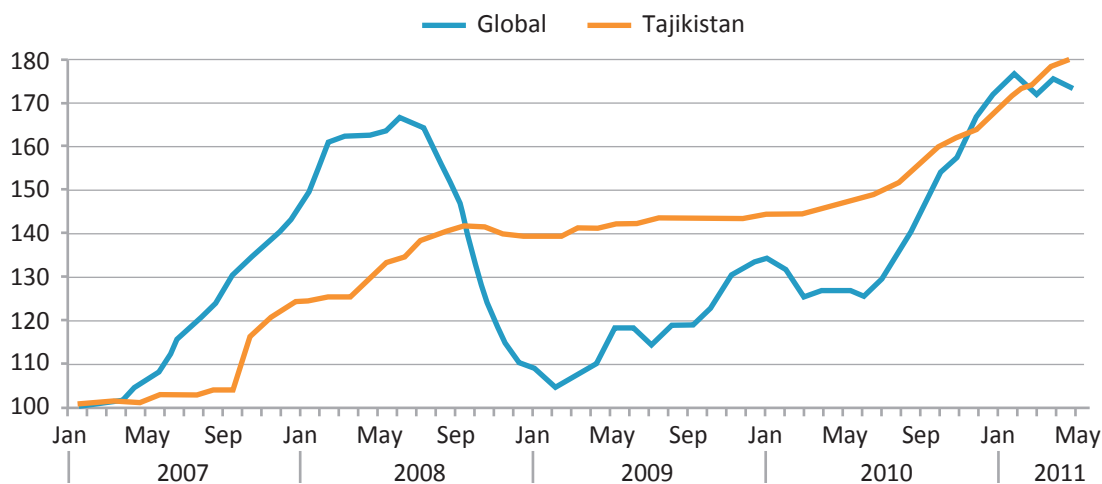
4. Implications for a Central Asian Regional Agricultural Cooperation Framework

4.1. Wheat Market Developments

In early 2011, Tajikistan was caught up in the global steady surge of staple food prices (see Figure 13). The main reasons for its food supply vulnerability resulted from a heavy dependence on importing wheat from a single source (Kazakhstan) and the lack of supply diversification. Vulnerabilities regarding transport aggravated the food crisis in Tajikistan because of the blockade by Uzbekistan and the lack of alternative transportation routes.⁴⁹

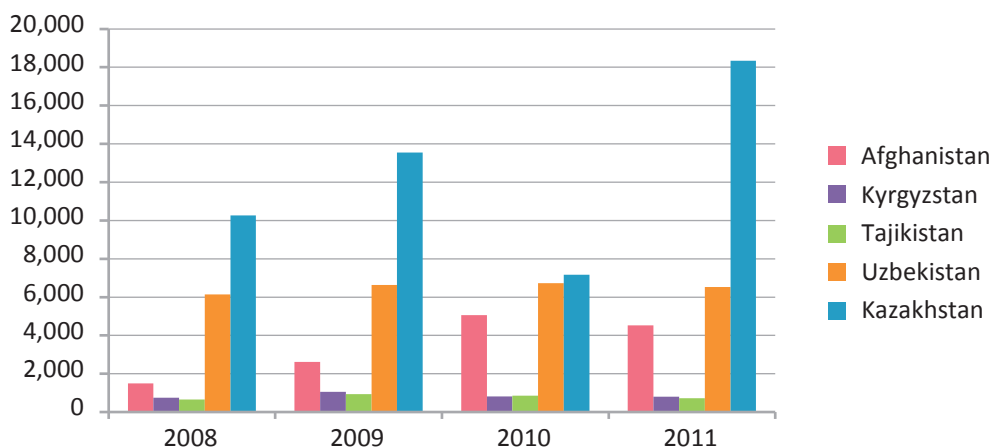
⁴⁸ Dina Tokbaeva, *Kyrgyzstan: Agricultural Woes Give Way to Food Security Concerns*, Eurasianet.org (April 25, 2012). <http://www.eurasianet.org/node/65314> (date accessed: November 12, 2012).

⁴⁹ Shokhboz Asadov, "Tajikistan's Transit Corridors and their Potential for Developing Regional Trade," *Institute of Public Policy and Administration (IPPA) Working Paper No.6* (Bishkek: University of Central Asia, 2012)

Figure 13. Food Price Trends in Tajikistan and Globally (2007-2011)

Adopted from German Agro Action. "What About Small Farmers? The Example of Tajikistan." *The International Journal for Rural Development* 45, no. 5, (2011): 31–33, http://www.rural21.com/uploads/media/rural_2011_5_31-33.pdf, (date accessed: November, 2012)

Growth in global wheat consumption has led to an increase in volume of trade of this commodity. It is estimated that the volume of the wheat trade in the last twelve years (2000- 2012) increased by 46 %, reaching 146 million tons.⁵⁰ The trade is expected to slow down and contract in 2013.

Figure 14. Wheat Outputs of Countries of the Region (thousand tons)

Source: KSA, NSC KR, SA and Central Statistics Organization of Afghanistan⁵¹

Kazakhstan, the only CA country capable of ensuring self-sufficient wheat production, has become an important player in the global wheat market in recent years. It is one of the ten leading world exporters of this important food commodity and dominates the market in Central Asia (see Figure 14). Wheat output in Uzbekistan, second largest producer, remained at the same level between 2008 and 2011. Afghanistan's output tripled in the given period. Tajikistan produces low quality wheat and strongly depends on the import of wheat and flour from Kazakhstan. In 2010

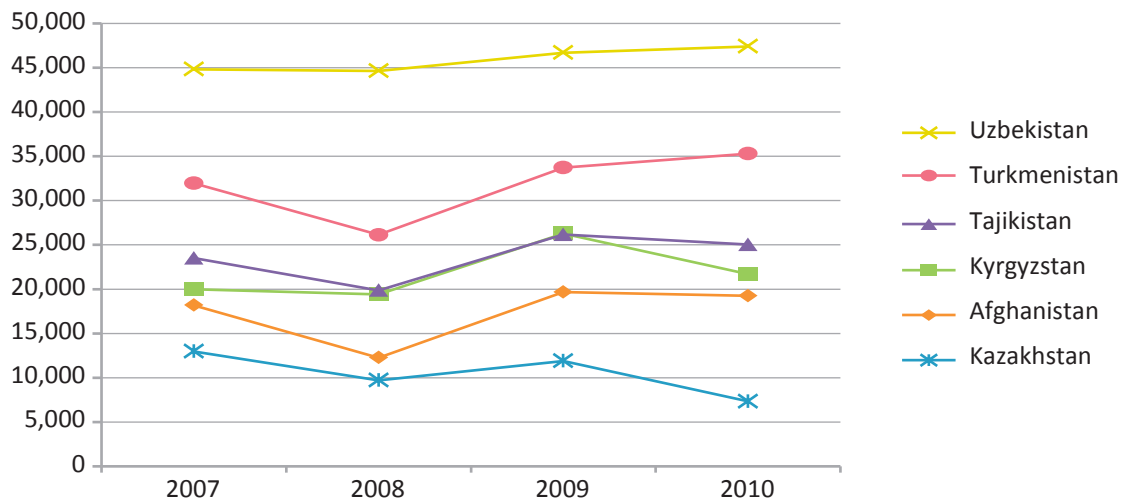
⁵⁰ International Grains Council. "Data Set for Wheat." *Grain Market Report for 2012*. http://www.igc.int/grainsupdate/igc_goi.xlsb, (date accessed: December 10, 2012)

⁵¹ Data for Afghanistan at <http://cso.gov.af/Content/files/Agriculture%20Development.pdf> (data accessed on 20.19.2012)

Kyrgyzstan and Tajikistan experienced declines despite favorable climatic conditions. This was mainly due to the reduced purchasing power of farmers for fertilizers and other inputs.

Notwithstanding strong output, Kazakhstan's production efficiency is of great concern. Its wheat yield per Ha is lowest among all ca states (Figure 15). Uzbekistan's producers are the most efficient in the region.

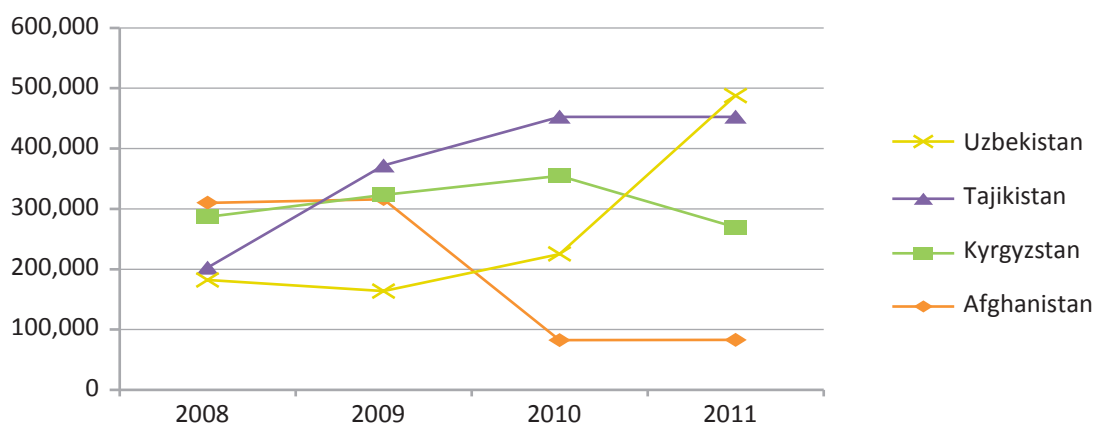
Figure 15. Wheat Yield in Central Asia (Hg/Ha)



Source: FAO, <http://faostat.fao.org/> (date accessed: November, 2012)

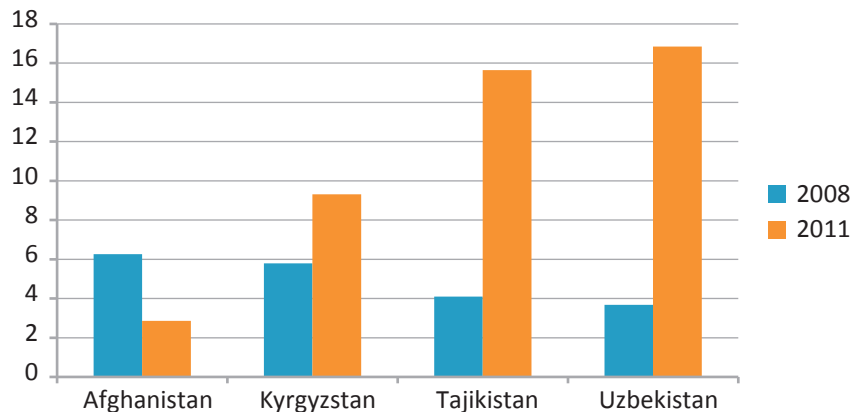
The steady growth in demand for food, combined with population and income growth, in Central Asia has caused an increase in demand in the regional market. National producers are not keeping up with growing demand and countries are increasing the volume of wheat and flour imports. In the absolute value the share of Uzbekistan, Kyrgyzstan and Tajikistan in Kazakhstan's wheat exports increased in recent years grew steadily. Uzbekistan increased its imports from Kazakhstan by 4.5 times in the span of four years (2008-2011). Afghanistan however decreased its imports from Kazakhstan by over 50 % in the given period, due to the diversification of import suppliers. (See Figures 16-17).

Figure 16. Kazakhstan's Wheat Exports to Central Asian Countries (2008-2011, tons)



Source: KSA, 2012.

Figure 17. Share of Central Asian Countries in Kazakhstan's Total Wheat Exports (%)



Source: KSA, 2012

4.2. Irrigation and Water Management

The poor condition of irrigation systems in Central Asia is a major factor impacting agriculture and food security in the region. Currently in Tajikistan, slightly over 80 % of arable land is irrigated (Figure 8). However, half of the existing pumping stations for irrigating agricultural land do not work and over 65 % of the irrigation systems have become unservicable.⁵² In recent years, agricultural land has been abandoned due to lack of irrigation water and the failure of the irrigation system. In 2008, 14,300 Ha of agricultural land were discounted when calculating total agricultural turnover, of which 12,900 Ha were irrigated. On average, over 885 Ha of land designated for agricultural use are taken out of circulation each year.

Located in the area of water run-off of the major river of Central Asia, the Amudarya, Tajikistan plays significant role in the sustainable development of agriculture of Uzbekistan and partially of Turkmenistan. Tajikistan's water-related relationships with its neighbours are based on Soviet agreements limited to the interstate sharing of water of that era. Such agreements do not cover or regulate emerging commercial relationships on usage of water and the management of hydroenergy resources of transboundary rivers.

Priority for water usage for newly arable lands in Soviet times were extended to the republics with the greatest cotton cultivation.⁵³ Water resources were directed to water-deficit republics located on the lower stream of Amudarya and Syrdarya Rivers. The irrigation system in Tajikistan was mainly build around large-scale cotton-growing farms. Areas surrounding these farms, including nearby households benefited and received water. As a result, Tajik-

⁵² Government of the Republic of Tajikistan in cooperation with the Coordination Council on Development, *Report on Results of Agriculture Reforming of the Republic of Tajikistan* (Dushanbe: Government of Tajikistan, 2012).

⁵³ Sarah L. O'Hara, "Central Asia's Water Resources: Contemporary and Future Management Issues," *Water Resources Development*, vol. 16, no. 3: 423–441 (Oxfordshire: Carfax Publishing, 2000).

istan still has the smallest territory of irrigated land (748 thousands Ha out of 14,2 million Ha of total territory⁵⁴) and water resources of the region.

Following independence, the institutional structure of water management in Tajikistan has not changed significantly, despite reforms to the Water Code, and the adoption of the Law on Water Users Association. Agricultural reforms discussed above reshaped the institutional structure of agriculture, creating hundreds of small dekhkan farms leading to increased inefficiency in water usage in agriculture. Water management is still defined by administrative boundaries, is administered jointly by the Ministry of Land Reclamation and Water Resources and local governments or *hukumats*, and is largely inefficient.

The Government realizes the need for reform in the management of water resources. Based on the recommendations of the working group consisting of local and international experts, the Government of Tajikistan has come to such an understanding, that the introduction of River Basin Management should form the basis for the reform, where the strategy of Integrated Water Resources Management is the main goal. Farmers' ability to effectively use the available water resources are also limited by the slow adaptation of water management to the conditions created after the privatization of farms.

Existing irrigation and drainage systems were designed for large collective farms and usually served several villages. Privatised farms often do not have their own equipment for control and accounting of water use, and rely on a water distribution locks of former kolkhozes. In the absence of a proper water seal and water measuring metres, farmers are required to pay a flat fee for irrigation, which reduces incentives for more efficient use of water. In accordance with the Government's regulation to encourage the effective use and management of water resources, a National Council for Water and Energy, comprised of representatives from concerned agencies and research organisations has been established.⁵⁵ The Ministry of Irrigation and Water Management is tasked with developing policy and monitoring of water use efficiency at four water basins determined by the Government (Syrdarya, Kofarnighan, Vakhsh and Panj Rivers). To effectively manage and collect fees for the use of irrigation water at the level of river basins, state organisations or *Mirob* (master water) shall be established and on-farm irrigation system Water User Associations (WUAs) should be in charge. This is an enormous task and serious challenge requiring full review and consideration of the water resource and usage related legislation, couple with proper funding.

In fact, during soviet period, an agency similar to MIROB existed in Tajikistan. The idea to resurrect the model is encouraged provided that it is in line with international principles of 1992 International Conference on Water and the Environment requiring all stakeholders, from decision makers to water consumers, to agree policy and make balanced decisions

⁵⁴ Taken from speech of the President of Tajikistan as of 30.11.2012, <http://www.khovar.tj/rus/president/35210-vystuplenie-e-rahmona-na-ceremonii-otkrytiya-novogo-zdaniya-gosudarstvennogo-komiteta-po-zemleustroystvu-i-geodezii.html> (accessed on 20.01.2013)

⁵⁵ Government of the Republic of Tajikistan, Resolution No. 451 (July 28, 2009).

about water resources and to protect the environment with the social and economic needs of citizens of a given country⁵⁶.

4.3. A Call for a Regional Agricultural Cooperation Initiative

In recent years, some of the world's leading wheat exporters have repeatedly used their right to ban the export of wheat and wheat related products. In most cases, such moves are triggered to stabilize, in short- and mid-term perspective, domestic supply and prices in face of drought/abnormal environmental conditions in a given country. Russia's ban in 2010 sparked a debate amongst net importers on how to ensure a stable supply and find ways for a predictable supply of wheat in emergency situations. Ukraine was the latest exporter seriously considering bans on wheat exports due to fears of a domestic deficit of bread products and price hikes in the autumn of 2012. Such speculations raised serious concerns and discontent amongst European states that import Ukrainian wheat.

In 2008, Kazakhstan introduced a similar export ban to stop inflation in the country and prevent of a repeat of the 2007 grain deficit. Such a move had a serious impact on the rest of Central Asia and triggered a new round of inflation. Tajikistan and Kyrgyzstan were immediately affected by the ban and started a search for alternative providers. Apart from importing countries, it should be emphasized that export bans also impact grain exporters who cannot reap the benefits of higher prices and are forced to settle for prices paid by the state.

An export ban is usually instituted in response to lower yields due to drought and other unfavorable weather conditions. Under such circumstances, continuous exporting may lead to the exhaustion of all surplus stocks of a country and in order to protect the domestic market, the exporting country unilaterally announces an exports ban.

Global market volatility, the frequency of unfavorable weather conditions, unexpected price hikes and subsequently concerns of sustainable livelihoods and the growing risk of food insecurity all pose valid challenges and should stimulate further discussions among stakeholders. There is a need to launch consultative processes regarding the establishment of a regional agricultural and food security cooperative initiative among CA states. Such an initiative should consider the following questions in relation to food supply and security: Should the countries take a more consolidated, aggregated look at where and how to support food production across the region? Should they focus on policy frameworks for food security, sustainable staple food supply in a holistic context, as opposed to considering issues separately? Would Kazakhstan take a stand and become a regional "champion" for ensuring a stable supply of cereals for the region?

⁵⁶ Principles: Water is a finite and vulnerable resource, essential to sustain life, development and the environment; Water development and management should be based on a participatory approach, involving users, planners and policy makers at all levels; Women play a central part in the provision, management and safeguarding of water; Water has an economic value in all its competing uses and should be recognized as an economic good.

Similar mechanisms are used extensively in other regions of the world. For example, the countries of the Caribbean Community (CARICOM) maintain the Regional Agriculture Market Intelligence System (RAMIS), a platform to provide information on regional market developments, including data on the availability of regional foods, and their respective nutritional content. Another example is the South Asian Association for Regional Cooperation's (SAARC's) Food Security Initiatives, launched in 2003 under the mandate of its Technical Committee for Agriculture and Rural Development. Agricultural trade and marketing, bio-security and other clusters are the main feature of this initiative. A Food Bank is also in place, with a mandate expanded beyond emergencies, acting as a regional food security reserve system in times of food shortages and emergencies.

CA States should seriously consider establishing a similar initiative, in which the leading net exporter of the region, Kazakhstan, takes the lead for food security cooperation and monitoring measures to ease the supply of main food crops and launch of monitoring tool for food security and sustainability.

Individual countries can no longer address food security challenges on their own, despite on-going donor-driven projects. CA states individually are too small to tackle agriculture development challenges due to limited resources, inadequate physical infrastructure, a questionable system of state reserves and market monitoring schemes. A dialogue for greater cooperation, and the acceleration of agriculture productivity and investment would benefit both regional net importers and net exporters.

Surveillance is increasingly recognized as an essential policy and planning tool. Currently, the donor community in Tajikistan runs a food security monitoring system that gives a seasonal snapshot of food insecurity developments in the country, with a specific focus on remote rural areas. The system highlights cases of seasonal food consumption trends, stocks and food prices, and provides ad hoc coping strategies analysis and future action plans.

An improved regional-public surveillance system, based on current monitoring systems, expanding the observation of food availabilities and import demands would help temper uncertainty and enable countries of the region to be prepared for the full impacts of possible crises. Such measures would also help stabilize the market.

A regional agriculture and food security initiative could also establish food reserves to be accessed on a preferential basis in times of deficits and poor harvests. Ultimately, regional food production, processing, distribution, and food safety and the agricultural public health systems should be capable of providing safe, adequate, nutritious and affordable food to the region's inhabitants at all times. This will improve livelihoods and improve food and nutrition security. Additionally, in the future, the initiative could also spur the establishment of a think-tank dedicated to serious research and action on the issue of food security.

5. Conclusions and Policy Implications

Low income CA states, such as Tajikistan, are food insecure in staple foods, particularly in light of the current situation with global food production and price volatility. The countries of the region have to increase their agricultural production and output to feed the region's 90 million people.

Nutritional deficiencies and poor food intake patterns remain a challenge for rational food consumption in the majority of CA countries. The prospect of reaching a modest level of nutrition and healthy life-style is unlikely to be achieved in the near future. Staple food self-sufficiency is a particular challenge for Tajikistan. Low agricultural productivity, the disintegration of a unified and heavily subsidized sector, and the lack of new technological is forcing countries of the region to be strongly dependant on food imports.

Empirical analysis confirms that households where heads are working in non-agricultural sectors with self-employment are more likely to be among those who do not have enough food, while other sectors do not have a significant impact. Households where heads are taking decisions on household's income spending also do not have enough food; this negative effect further increases in absolute size if the household's head is male.

The latter should signal for republican and rural authorities to take measures and increase public awareness campaign encouraging greater role of women in decision making process in agricultural activities. The Tajik Government should continue to strengthen both economic and social roles of women. Education of women have a positive relation with children health and education. While earnings of working women at outside family work help families to life their financial constraints, and eventually to increase food consumption and ration. The Tajik Government along with donor organizations should focus more in rural areas where the chances for women on education and employment are the lowest.

The Tajik Government should continue its land reform in order to insure the justice and free access of every farmer to the farming land. It is important for the Government and the international organizations operating in Tajikistan to eliminated the land corruption and land selling frauds. The Government should establish the robust market institutes which insure the transparent land rent, and the competition between tenants for renting different qualities of arable lands.

The Tajik Government and the international community should focus on increasing employment opportunities within Tajikistan, encourage the development of small and medium enterprises, which can effectively provide more workplaces and invest in the development of knowledge-based production and innovations. Along this, the Government has to insure the establishment of an efficient labor market to make attractive the investment in education and knowledge. It also have to consider the increase in minimum wage rate periodically by taking into account the current economic development conditions of the country

The breeding of cattle, sheep and goats does not have a significant effect on food sufficiency. However, poultry breeding increases the probability of not having enough food. The reason

might be that families that are involved in poultry breeding due to insufficiency of funds. If they had enough money, they could breed cattle or sheep. Finally, the horse breeding decreases the probability of not having enough food, since horses are expensive, having horses might be an indicator of good economic conditions of families.

Information on food consumption patterns and expenditure is vital for analysis and the formulation of sound food and nutrition policy, and the design of effective intervention and prevention programmes and for food control and safety programs. Regional food policies can be developed from the perspective of the agricultural sector of the region, with emphasis on the sustained availability of foods.

The countries of the region cannot afford to be complacent and must be more proactive than reactive, in the context of improving availability of cereal crops and staple foods in general. A Regional Agricultural Cooperation Initiative should be developed to address both crisis and long-term conditions related to food security, and therefore to agriculture and water resource management.

Regional governments should make an effort to initiate a regional agricultural cooperation framework to better monitor food security conditions and agricultural policies, and cooperate on rapid reaction measures to address ad hoc shortages or supply crises. Cooperation is beneficial in terms of credible export expansion for Kazakhstan and in terms of stable supply of wheat for importing countries. It may ultimately lead to closer integration of countries of the region.

There is the need for an intergovernmental commission to monitor usage of water at upper and lower sites of trans-border basin of Amudarya and Syrdarya Rivers. For coordination purposes, regional basin bodies should be established to facilitate regional cooperation and develop and implement joint regional water policy.

The countries of the region should also seek better coherence and coordination in their policy responses, especially during abnormal food market developments. Initially, the regional framework mechanism could be empowered and delegated by member-countries with responsibilities focusing on major interventions and regulatory policy development. Countries in the region should carefully examine the implications of food price hikes and eschew policy actions that might appear useful in the short term, but could do serious harm in the long-run.

References

- A. Colin Cameron and Pravin K. Trivedi. *Microeconometrics: Methods and Applications*. Cambridge: Cambridge University Press, 2005.
- Ernst and Young. *Special Audit of National Bank of Tajikistan, 2009*. <http://ayina.files.wordpress.com/2009/04/nbt1.pdf> (date accessed: December, 2012)
- Agency for Statistics of the Republic of Kazakhstan. *Vneshnyaya Torgovya Respubkili Kazakhstan za 2007-2011*, Statistical Bulletin, Astana: Government of Government of the Republic of Kazakhstan, 2012
- _____. *Uroven' zhizni naseleniya v Kazakhstane za 2007-2011*, Statistical Bulletin, pp.245-246, Astana: Government of the Republic of Kazakhstan, 2012b
- _____. *Kazakhstan v 2011 godu*, *Statisticheskiy Ezhegodnik*, Astana: Government of the Republic of Kazakhstan, 2012c
- Amartya Sen. "Ingredients of famine analysis: Availability and entitlements." *The Quarterly Journal of Economics*, 96, no.3, August, 1981.
- Dina Tokbaeva. *Kyrgyzstan: Agricultural Woes Give Way to Food Security Concerns*. Eurasianet.org, April 25, 2012. <http://www.eurasianet.org/node/65314> (date accessed: November 12, 2012).
- Evelyn Ganzglass and Kevin Murphy, "Workforce Competitiveness Assessment in Tajikistan", http://pdf.usaid.gov/pdf_docs/PNADK006.pdf (report accessed on Jan.12, 2013)
- Food and Agriculture Organization. *Food Balance Sheet. A Handbook*, Rome: FAO, 2001
- _____, "Procuring Wheat Flour, Pulses and Vegetable Oil in Tajikistan", *Procuring local foods in Tajikistan*, FAO Office In Tajikistan (2011)
- Francesco Burchi and Pasquale De Muro. A Human Development and Capability Approach to Food Security: Conceptual Framework and Informational Basis. *Working Paper 2012-009 Regional Bureau for Africa*. United Nations Development Programme, 2012.
- German Agro Action. "What About Small Farmers? The Example of Tajikistan." *The International Journal for Rural Development* 45, no. 5, 2011: 31–33, http://www.rural21.com/uploads/media/rural_2011_5_31-33.pdf, (date accessed: November, 2012)
- Government of the Republic of Tajikistan, in cooperation with the Coordination Council on Development. *Report on Results of Agriculture Reform in the Republic of Tajikistan*. Dushanbe: Government of Tajikistan, 2012.
- Government of the Republic of Tajikistan. *Poverty Reduction Strategy 2010-12*. Dushanbe: Government of the Republic of Tajikistan, 2010.
- International Food Policy Research Institute (IFPRI). *2012 Global Hunger Index*. Washington D.C: IFPRI, 2012. <http://www.ifpri.org/publication/2012-global-hunger-index>,
- Gulmahmad Valimuhamadkhon. *Rol' selskogo khozyastva v prodovolstvennom obespechenii Pamira*. Dushanbe: Donish Printing House, 2007.
- Helen Shahriari, Alexander M. Danzer, Renee Giovarelli and Asyl Undeland. *Improving Women's Access to Land and Financial Resources in Tajikistan*, World Bank Report, <http://siteresources.worldbank.org/INTTAJIKISTAN/Resources/CombinedGenderESWreportENG.pdf>, (Report accessed on February 26, 2013)
- International Grains Council. "Data Set for Wheat." *Grain Market Report 2012*. http://www.igc.int/grainsupdate/igc_goi.xlsb, (date accessed: December 10, 2012)
- Islamic Republic of Afghanistan, Ministry of Agriculture, Irrigation and Land. *Agriculture Prospect Report*. Kabul: Statistics and Marketing Information Office, 2010.

- Jane Falkingham. "A Profile of Poverty in Tajikistan." *Case Paper 39*. London: London School of Economics, 2000.
- John Martin. "The Myth of the Consumption-Oriented Economy and the Rise of the Desiring Subject." *Theory and Society: Renewal and Critique in Social Theory*, vol. 28, Netherlands, 1999.
- National Statistics Committee of Kyrgyz Republic (NSC KR). *Brief Statistical Handbook 2008-11*. Bishkek: NSC KR, 2012a.
- _____. *Informatsionniy Bulleten' Kyrgyzskoi Respublicki po Prodovol'stvennoi Bezopasnoti I Bednosti*. No.2/2012, Bishkek: NSC KR, 2012b.
- _____. *Kyrgyzstan v tsifrakh. Statistichkiy sboirnik*. Bishkek: NSC KR, 2012c.
- Organisation for Economic Co-operation and Development (OECD). *OECD Glossary of Statistical Terms: Food Security*. Paris: OSCE, 2012, <http://stats.oecd.org/glossary/detail.asp?ID=5006> (accessed November 19, 2012).
- Roman Mogilevskii. "Trends and Patterns in Foreign Trade of Central Asian Countries." *Institute of Public Policy and Administration (IPPA) Working Paper No.1*. Bishkek: University of Central Asia, 2012.
- Saeed Parto, Jos Winters, Ehsan Saadat, Mohsin Usyan and Anastasiya Hozyainova. "Afghanistan and Regional Trade: More, or Less, Imports from Central Asia?" *Institute of Public Policy and Administration (IPPA) Working Paper No.3*. Bishkek: University of Central Asia, 2012.
- Sarah L. O'Hara. "Central Asia's Water Resources: Contemporary and Future Management Issues." *Water Resources Development*, vol. 16, no. 3: 423-441. Oxfordshire: Carfax Publishing, 2000.
- Sarosh Sattar and Shahib Mohib. "Tajikistan: Cotton Farmland Privatization" in *Poverty and social Impact Analysis of Reforms: Lessons and Examples from Implementation*, ed. A. Coudouel, Anis A. Dani and Stefano Paternostro, Washington D.C: World Bank, 2006.
- Shemyakina, Olga, 2011. *The Labor Market, Education and Armed Conflict in Tajikistan*, Policy Research Working Paper 5738, Washington DC: World Bank, 2011.
- Shohkboz Asadov. "Tajikistan's Transit Corridors and their Potential for Developing Regional Trade." *Institute of Public Policy and Administration (IPPA) Working Paper No.6*. Bishkek: University of Central Asia, 2012
- State Statistics Committee of the Republic of Tajikistan and UNICEF. *2007 Tajikistan Living Standard Survey. Indicators at a Glance*. SA and UNICEF, Dushanbe, 2009
- Statistics Agency under the President of the Republic of Tajikistan (Agentsvo po statistiki pri Prezidente Respubliki Tadjikistana). *Prodovol'stvennaya bezopasnost' I bednost'*. No.2011-4. Dushanbe: 2012a.
- _____. *Prodovol'stvennaya bezopasnost' I bednost'*. No.2012-2. Dushanbe: 2012b
- _____. *Sel'skoe khozyaystvo Respubliki Tadjikistan*. Dushanbe: 2012c.
- _____. *Sotsialno-ekonomicheskoe polozhenie Respubliki Tadjikistan*. Dushanbe: 2012d.
- _____. *Osnovnie pokazateli obsledovaniya budzhetov domashnikh khozyastv*. Dushanbe: 2012e
- _____. *Tadjikistan: 15 Let Gosudarstvennoy Nezavisimosti. Statistichkiy sbornik*. Dushanbe, 2006.
- World Bank. "Republic of Tajikistan. Poverty Assessment Update." *Report 30853-TJ*. Washington D.C: World Bank, 2005.
- World Health Organisation (WHO). "Diet, Nutrition and Prevention of Chronic Diseases." *WHO Technical Report Series 916. Report of a Joint WHO/FAO Expert Consultation*. Geneva: WHO, 2003.
- Zvi Lerman and David Sedik. "The Economic Effects of Land Reform in Tajikistan." *Policy Studies on Rural Transition, 2008-1*. Budapest: Food and Agriculture Organization of the United Nations, 2008.

_____. "Farm Debt in Transition Countries: Lessons for Tajikistan." Selected Paper, Agricultural & Applied Economics Association (AAEA), AAEA & ACCI Joint Annual Meeting, Milwaukee, Wisconsin, 2009.

_____. "The Economic Effects of Land Reform in Central Asia: Case of Tajikistan." *Discussion Paper 16.08*. Jerusalem: Hebrew University of Jerusalem, 2008.

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