Food Security, Regional Trade, and Food Safety in Central Asia –
Case Studies from Kyrgyz Republic and Kazakhstan

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Abstract
*Central Asia experienced major socio-economic shocks during the 1990s, which has increased food insecurity, malnutrition, and poverty. In response, Central Asia has adopted food self-sufficiency policies. This paper argues that regional and international trade can improve food security if implemented properly. However, a new constraint on food trade has arisen — **food safety**. Using the World Bank's Living Standard and Measurement Survey for Kyrgyz Republic and Kazakhstan, this paper analyzes Central Asia's household food security policy options. Evidence shows that food safety practices will affect external food trade in Central Asia. Finally, a framework for reviving food trade is proposed.*

Keywords: Central Asia, Kazakhstan, Kyrgyzstan, food security, food safety, trade

1. Introduction
Since the breakup of the Soviet Union, the countries in Central Asia—Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekinstan—have experienced major socio-economic shocks that have resulted in increased food insecurity, malnutrition, and poverty. Each country has implemented economic reforms, in varying degrees, in order to transform their centrally planned economies into market economies. However, economic instability, incomplete land reforms, inadequate institutional reforms, collapse of regional trade, and depleted foreign reserves have resulted in food insecurity and inefficient use of natural resources for food production. One strategy that will assist in improving food security in Central Asia is the use of regional and international trade. However, food safety regulations may constrain the expected output from food trade.

This paper will emphasize the impact of food safety regulations on achieving food security. To gain a better understanding of the food security situation in Central Asia, this paper will first review the past food security condition in Central Asia, and then the future prospects for food security in Central Asia. Following this situational analysis, the paper will review the trade policies of Kazakhstan and Kyrgyzstan. Then, the impact on food safety regulations on trade, and ultimately, food security is discussed. Finally, a framework for reviving regional food trade among the Central Asian Republics as well as increasing international trade is developed.

2. Food Security in Central Asia
The rise in Central Asia's food insecurity is an indirect result of a poor macroeconomic environment, which is illustrated by the fall in national output and high inflation rates (Babu and Reidhead, 2000). Food insecurity will continue to rise because the domestic supply of food will not completely satisfy the domestic demand for food. From 1990 to 1997, the demand for the use of cereals in total consumption for Central Asia declined (Pandya-lorch and Rosengrant, 2000). However, the majority of this decline was in the consumption of feed for livestock. In 1990, the demand for cereals as feed was 27.5 million tons, but in 1997, this demand was only 18.9 million tons. Although demand for human consumption did not decline, food insecurity will worsen when livestock production does not satisfy the expected future increase in the demand for meat and meat products. In Kazakhstan, the annual per capita consumption of cereal products increased from 148 kilograms in 1990 to 200 kilograms in 1997 (Baydildina et al, 2000). Although Kyrgyzstan's per capita grain consumption did not fluctuate much between 1985 and 1994, it increased from 986,200 tons in 1995 to 1.7 million tons in 1998 (Babu and Reidhead, 2000).

Even with the rise in cereal production and consumption, food security through calorie accumulation has not been achieved for all within these two countries. The per capita mean calorie consumption for the poorest quartile in Kazakhstan is 2,475 calories per day, which is greater than the World Health Organization's (WHO) recommended 2,200 calories per day; however, 20.6 percent of the total population is below the WHO's recommended calorie intake and 41 percent of Kazakhstan's poorest people are calorie inadequate. In addition to food insecurity, the foods consumed are not providing sufficient levels of nutrients. Approximately 9 percent, 12 percent, and 24 percent of the people in the poorest quartile is deficient in protein, iron, and/or vitamin A,

respectively (Table 1). These deficiencies can lead to unwanted health difficulties, which lowers economic productivity.

Table 1: Estimates of food and nutrition insecurity in Kazakhstan, 1996

	Expenditure quartile				
	I	II	III	IV	All
Calorie intake (kcal/person/day)	2475	3213	3558	3671	3095
Calorie inadequacy (share below 2,200 kcal/day)	41.0%	12.5%	7.8%	7.9%	20.6%
Protein intake (grams/person/day)	92	122	134	141	117
Protein inadequacy (share below 45 g/day)	9.3%	1.4%	1.2%	2.3%	4.2%
Iron intake (mg/person/day)	20	27	31	40	30
Iron inadequacy (share below 10 mg/day)	11.7%	2.3%	1.2%	0.8%	4.1%
Vitamin A intake (IU/person/day)	2411	3461	4258	4605	3472
Vitamin A inadequacy (share below 1,000 IU/day)	23.8%	5.8%	2.3%	6.3%	11.0%

Source: Babu, Reidhead, and Rhoe (2001) (based on Kazakhstan 1996, Government Statistical Committee (GOSKOMSTAT), Government of Kazakhstan)

In comparison, the food insecurity is much higher in Kyrgyzstan than in Kazakhstan. This difference may be the result of cereal production. Before the dissolution of the Soviet Union, Kazakhstan produced the majority of the cereal products for the entire region, but the adoption of the self-sufficiency policy in agricultural goods has resulted in Kazakhstan reducing the production of cereals. This policy has forced the other Central Asian countries to increase their production of cereals (Meng, Longmire, and Moldashev, 2000). However, the removal of subsidies has increased the difficulty for individual countries to produce sufficient quantities to meet the demand. Although the food security situation in Kyrgyzstan is worse than in Kazakhstan, there are signs of improvement. In 1993, the percent of the total population not consuming the recommended quantity of calories was 59%, but by 1997, the calorie inadequacy population dropped to 40%. However, the poorest quartile still suffers from 74% calorie inadequacy in 1997. There has also been an improvement for almost all quartile groups in protein, iro, and vitamin A (Table 2)

Table 2: Estimates of food and nutrition insecurity in Kyrgyzstan, 1993 and 1997

	Expenditure quartile				
	I	II	III	IV	All
1993					
Calorie intake (kcal/person/day)	1,125	2,072	2,650	3,046	2,092
Calorie inadequacy (share below 2,200 kcal/day)	84%	61%	45%	32%	59%
Protein intake (grams/person/day)	36	62	77	91	63
Protein inadequacy (share below 45 g/day)	71%	39%	28%	29%	43%
Iron intake (mg/person/day)	12	23	27	37	24
Iron inadequacy (share below 10 mg/day)	67%	37%	27%	16%	38%
Vitamin A intake (IU/person/day)	846	1,515	1,865	2,399	1,697
Vitamin A inadequacy (share below 1,000IU/day)	75%	52%	43%	33%	50%
1997					
Calorie intake (kcal/person/day)	1,398	1,934	2,464	3,026	2,160
Calorie inadequacy (share below 2,200 kcal/day)	74%	45%	22%	10%	40%
Protein intake (grams/person/day)	55	69	87	104	77
Protein inadequacy (share below 45 g/day)	50%	37%	22%	13%	32%
Iron intake (mg/person/day)	10	14	21	29	19
Iron inadequacy (share below 10 mg/day)	68%	50%	31%	12%	405%
Vitamin A intake (IU/person/day)	2,215	2,504	3,139	3,930	2,848
Vitamin A inadequacy (share below 1,000 IU/day)	39%	28%	21%	10%	26%

Source: Babu and Reidhead (2000) (based on Kyrgyzstan 1993 and 1997 LSMS data, National Statistical Committee (NATSKOMSTAT), Government of Kyrgyzstan)

The food self-sufficiency policies within these countries have increased the amount of cultivated land for grain and ultimately grain production for all countries except Kazakhstan, but this policy has resulted in lower production of other food products that are higher in nutrients. Central Asia as a whole reduced livestock production by 30 percent between 1992 and 1997, while the demand for meat and meat products declined 0.48 million tons from 2.23 million tons to 1.75 million tons (Pandya-Lorch and Rosengrant, 2000). However, the rising population and increasing urbanization is expected to increase the demand for meat and meat products (Pandya-Lorch and Rosengrant, 2000). If you recall, the demand for cereals to be used as animal feed dropped to 8.6 million tons during 1990 to 1997. This reduction will ultimately affect the quantity as well as the quality of meat products that are produced and processed in Central Asia. From 1992-1996, the FAO calculated the percent change in the decline in cattle for both Kazakhstan and Kyrgyzstan as 25 percent and 27 percent, respectively. The percent change in the fall of sheep as 44.7 percent and 55.8 percent, respectively, and the percent change in the increase in goats for Kazakhstan was 15.4 percent and there was a 33.3 percent decrease for Kyrgyzstan (Suleimenov and Oram, 2000). More specifically the demand for meat and meat products in Kazakhstan was at a high of 70 kilogram per year in 1990 and dropped to 46 kilograms per year in 1994 (Government of Kazakhstan, 1995). Then the consumption of meat and meat products stabilized at 50 kilograms per year (Baydildina et al, 2000). In Uzbekistan, meat and meat products consumption has hovered around 31 kilograms per year from 1994 to 1998, the annual consumption norm is 75.6 kilograms per year.

Using data from the Living Standard and Measurement Survey of the World Bank for Kazakhstan, the food energy method was used to calculate the poverty line of Kazakhstan. Using data from 1996, the poverty line in Kazakhstan is 54.3 tenges or US$0.79[1]. To gain a better understanding of the poverty level in Kazakhstan three poverty measures were calculate: head count ratio, weighted shortfall index, and aggregate income gap index (Table 3). Using the food energy method for calculating the poverty line allows us to determine the number of people who do not have the financial capabilities to purchase the typical food basket in Kazakhstan. In Kazakhstan, 16.0 percent of the entire population is below the poverty line of 54.3 tenge per day and the amount of income necessary for all people, who are below the poverty line in our study to be at the poverty line of 54.3 tenge per day is 4,911.98 tenge per day.

Table 3: Poverty measures in Kazakhstan, 1996

Variable	Value
Poverty line (Z)	54.3
Poverty measures	
Headcount (H)	0.16
Aggregate income gap (G)	-4911.98 Tenge/day (for 318 'poor' households)
Weighted shortfall index (P)	0.01935

Source: Babu, Reidhead, Rhoe, (2001) (based on Kazakhstan 1996 LSMS, Government Statistical Committee (GOSKOMSTAT), Government of Kazakhstan)

Although food security during the first decade of independence was not achieved, what is the likely prospect of achieving food security by 2020? Some factors that lead to changes in food security are population growth, economic growth, food production, and food demand. It is projected[2] that the population of each Central Asian country to increase (Table 4) (Pandya-Lorch, 2000; UNDP, 1996). In addition to population increasing, the demand of both cereal and meat products are expected to rise by 3.37 million tons (31.58 percent change) and 0.91 million tons (46.7 percent change), respectively by 2020 (Table 5) (Pandya-Lorch, 2000). With both increases in population and food demand, is their sufficient food within the Central Asian countries to satisfy the demand? It is projected that the per capita food availability will increase 6.1% as a whole for Central Asia from 2,685 calories per day in 1995 to 2,850 calories per day in 2020. In spite of the negative economic growth during the 1990s, all of the Central Asian countries are expected to have a 3 percent economic growth at least up to the year 2020 (Pandya-Lorch, 2000). Even with positive economic growth expected, the Central Asian countries will need to import some cereals and double their imports in meats in order to meet the food demand (Pandya-Lorch, 2000), which may not meet the quantity and quality of food needed for food security due to low purchasing power.

[1] $1 = 69 tenge (ADB, 1996)

[2] The projections were calculated using the International Model for Policy Analysis of Commodities and Trade (IMPACT), which was developed by researchers at the International Food Policy Research Institute. The projected figures are for the period 1995 to 2020.

Table 4: Medium-variant population projections for Central Asia, 1995-2020

Country	1995 millions	2020	Change 1995-2020
Kazakhstan	16.8	18.7	1.9
Kyrgyzstan	4.5	5.3	0.8
Tajikistan	5.8	8.5	2.7
Turkmenistan	4.1	5.7	1.6
Uzbekistan	22.8	32.3	9.5

Source: Pandya-Lorch (2000); UNDP (1996)

Table 5: Demand and Imports of cereals and meat

Central Asia	1995	2020	Change 1995-2020
Cereal Demand (millions of tons)	18.06	24.01	5.95
Meat Demand (millions of tons)	1.95	2.86	0.91
Per Capita Cereal Demand (kilograms)	335	345	10.0
Per Capita Meat Demand (kilograms)	36	41	5
Per Capita Calorie Availability (calories per day)	2,685	2,850	165
Imported Cereals (millions of tons)	-0.51	-0.76	.25
Imported Meat (millions of tons)	-0.16	-0.38	0.22

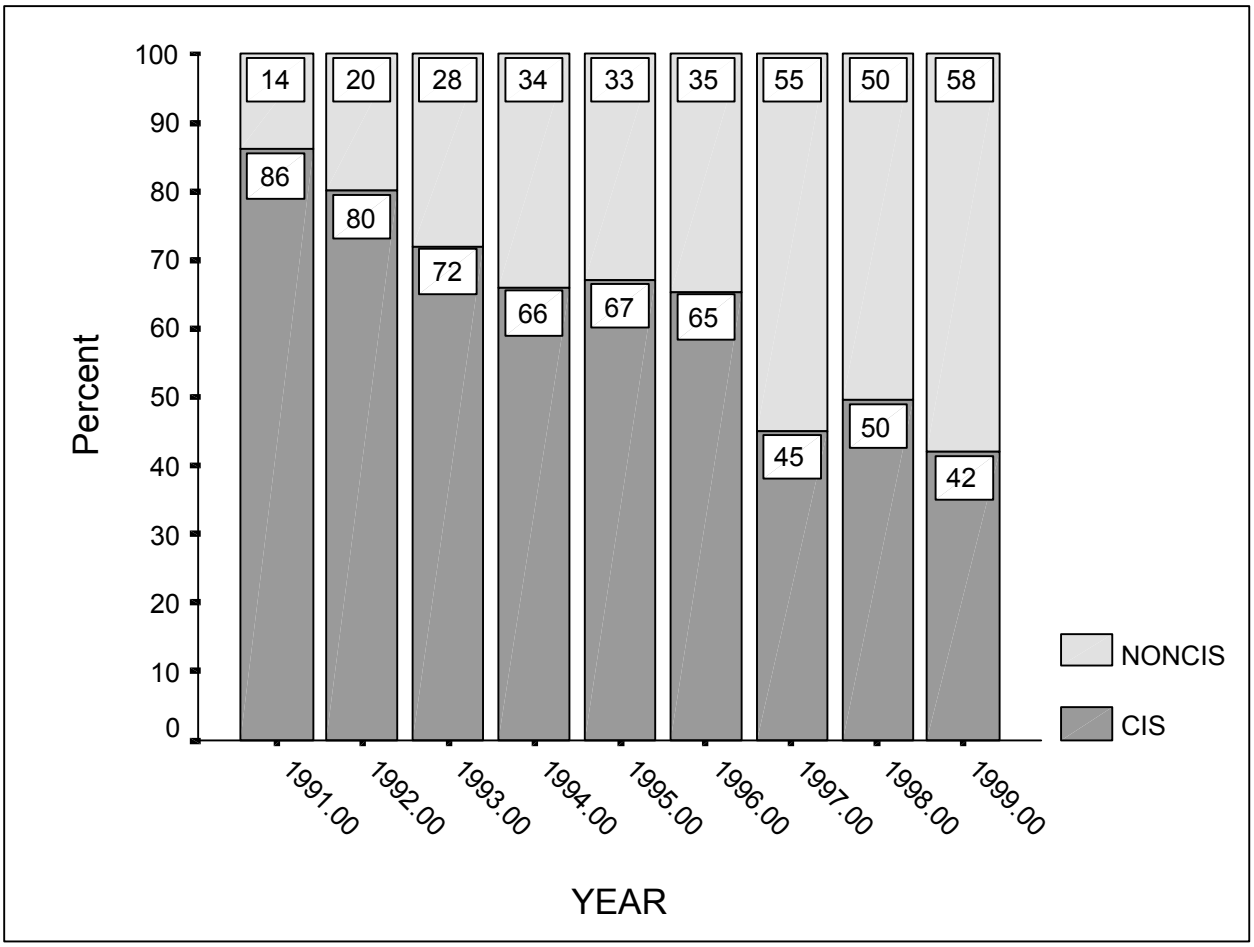
Source: Pandya-Lorch (2000)

3. Trade Policy

With the independence of the Soviet Republics, came the breakup of interregional trade. This collapse in trade forced Central Asia to adopt a food self-sufficiency policy, which resulted in less trade, especially food products of the country's comparative advantage. Although food trade has decreased, agriculture is one of the main economic engines in Central Asia. Furthermore, increasing trade in agricultural products is essential in solving Central Asia's food security problem in three arenas. First, exporting excess food grains, which is a result of the food self-sufficiency policy, will increase foreign exchange that could be used to import higher nutrient foods that are demanded by the society. Second, reinitiating some of the initial interregional trade, will allow countries to grow comparative advantage crops; therefore, resources will be used more efficiently, and the end result will be higher incomes. Higher incomes permit people to purchase necessary foods or inputs that will improve food security. Furthermore, efficient use of natural resources allows yields to remain high. At the present time, inefficient use of natural resources due to inappropriate crops and lack of fertilizers has resulted in lower yields. Third, a large portion of the population in Central Asia works in agriculture. For example, 40 percent of Uzbekistan's population and 42 percent of Tajikistan's population perform agriculture work (Tashmatov et al, 2000). Furthermore, 25-30 percent of Uzbekistan's GDP is derived from the agricultural sector and 55 percent of its foreign currency is collected through agricultural exports (Tashmatov et al, 2000) and in 1999, about 45 percent of Kyrzygstan's GDP, 50 percent of the labor force, and 22 percent of exports (including agribusiness) are from the agricultural sector (World Bank, 2000). Exportation of processed food products will not only increase foreign reserves, which can be used to offset imports, but it is also a productive method in increasing the incomes of the rural population.

Kyrgyzstan's, economy relies heavily on agriculture and the food processing industry. It produces cotton, tobacco, oils, tomatoes, cabbage, onion, table grape, and wine grapes. The farmers also raise sheep and large horned cattle. In response to the formal and informal trade restriction of the Former Soviet Republics, Kyrgyzstan has shifted from exporting to CIS countries to non-CIS countries (Figure 1). Furthermore, as a recent member of the World Trade Organization, it will also be liberalizing all foreign trade activities and adopting international standards (Kyrgyzstan Development Gateway, 2000).

Figure 1: Structure Turnover of Kyrgyzstan (%)



Source: Kyrgyzstan Development Framework, 2000

Kazakhstan has experience a decline in wheat production, supply, and exports as the result of changing cropping patterns (Meng, Longmire, and Moldashev, 2000). Prior to independence, Kazakhstan was one of the main exporters of cereals to the other republics, now that the countries have adopted food self-sufficiency Kazakhstan has reduced the amount it produces in order to grow other crops to meet their food needs. This reduction in the production of grain has dramatically affected Kazakhstan's exports. In the early years of independence, Kazakhstan reached its highest export level for the decade. Then exports fell 50% after 1993. Exports rose briefly, but the drought of 1998/99 cause grain exports to decline again. In addition to the drought, what institutions directly affected the wheat supply available for export? The decline in the investment of both scientific research and human capacity (Meng, Longmire, and Moldashev, 2000) as well as the degradation of the resource base has impeded the growth of the wheat supply (Longmire and Moldashev, 1999). Moreover, poor storage, processing, and distribution facilities resulted in one-third of its 1992 total bumper stock being wasted (Pomfret, 1995). The existing infrastructure was built primarily for the transport of grain and other goods from Kazakhstan to other regions of the Soviet Union, and now, there is a need to upgrade the facilities to meet international standards. Although Russia and other former republics continue to be primary export markets for Kazakhstan there is a need to target other export markets because these countries have begun to grow their own grains. In order to target other export markets it is necessary to establish food safety regulations

4. Food Safety

Adequate, equivalent, and scientifically based (Lichtenberg, forthcoming) food safety regulations will allow Central Asian countries to trade food products easily with other developing and developed countries. With the opening of markets, through the lowering of tariffs and removal of quotas, world food trade is $400 to $500 billion dollars a year (Prasidh, 1999). If Central Asia does not implement food safety regulations that meet the needs of importing countries, then the producers, processors, and exporters of these goods could face product and financial loss due to detention, rejection, or destruction of the imported food goods (Hammer, 1999). The

financial losses of the exporting company will have a negative impact on the processing companies employees as well as the producers of the food since lower income due to reduce level of trade results in increased food insecurity. Therefore, to ensure that trade in food goods from Central Asia to the rest of the world continues or increases food safety regulations must be implemented.

Although food safety regulations are necessary, they are not sufficient. Capacity strengthening at all levels of the process is necessary. Training policymakers, analysts, scientist, inspectors, processors, and producers should be a priority of the governments in Central Asia. Policymakers need to have adequate training so they are capable of designing policies that meet the food safety needs of their own country. Also, food safety regulations need to be harmonized with the international standards in order for trade to occur. Even if the food safety regulations within each Central Asian country is equivalent to importing countries, the food export industries may not have the necessary training to handle, process, package, and transport the food to meet the requirements of the importing country. Furthermore, capacity within export control programs (inspection and laboratory services) may need to be strengthened (Hammer, 1999).

Several constraints hamper the progress of Central Asian countries implementing food safety regulation. The first constraint, which has already been mentioned, is a lack of human capacity. The second constraint is the lack of financial capacity to conduct training, to monitor and enforce food safety requirements, and to develop appropriate infrastructure (processing enterprises, storage, transportation infrastructure, etc.). The third constraint is food safety's importance to the political agenda. With the demand for food falling as a result of low purchasing power as well as caloric and nutrient needs not being met, the government of each Central Asian country may not have food safety as a top priority for its exports. The fourth constraint is the fragmentation between the different agencies that handle food issues. The fifth constraint is the inadequate post-harvest infrastructure. The last constraint is the inadequate representation of developing countries at Codex meetings (Prasidh, 1999). In response to these constraints and the need to induce trade, a framework was developed to increase regional and international trade.

5. Regional and International Trade Framework

There is little information about the remaining trade activities taken place in Central Asia because trade activities broke down after the Soviet Union collapse, and at the present time, only main commodities such as cotton from Uzbekistan is being traded. To achieve sustainability and improved food security, bilateral as well as multilaterally trade agreements need to be established between the region and the rest of the world. The first step is to establish regional trade agreements between the Central Asian countries regarding food commodities. Once these regional trade agreements are successfully implemented, then bilateral and multilateral agreements regarding non-food goods such as agricultural inputs can be agreed upon and implemented. For example, a bilateral agreement between Kyrgyzstan and Kazakhstan would allow Kazakhstan to trade wheat, its comparative advantage good, for vegetables from Kyrgyzstan's.

Bilateral and multilateral trade agreements will formalize the small amount of informal trade that already exists. Formalizing trade will relinquish some of the transaction costs that traders incur because it will be easier for traders to export their goods as well as establish markets. Furthermore, bilateral and multilateral trade allows countries to produce goods that they have a comparative advantage in. In particular, Kyrgyzstan can export fruits and vegetables while Uzbekistan can export cotton. The production and exportation of a comparative advantage good will be profitable for the transaction countries because each country will use its natural resources as well as other inputs such as labor efficiently. Second, the cost of importing the good is cheaper than the cost of producing the same product for the non-comparative advantage country. This lower cost allows income to be spent on the production of goods that will be more profitable for the country. Furthermore, the cost of the food commodity to the consumers will be lower than the cost of it being produced domestically; therefore, the poor will have a higher income, which will allow them to purchase higher-nutrient foods and inputs needed to improve food security. The ability of countries to produce a comparative advantage good will not only benefit the exporting country but if implemented properly will benefit the region as a whole. Therefore, it is necessary to look at the vertical integration of the market within each country. For example, vertical integration in the production to exportation of wheat can reduce the transaction cost as well as the capital cost associated with the activities of processing, transportation, storage, and exportation. This integration may eliminate some of the difficulties these countries face in safely exporting goods as well as the ability to eliminate some of the waste incurred with storage and transportation.

With each Central Asian country applying for membership into the World Trade Organization (WTO), producing goods that are the country's comparative advantage will make their exports more competitive in the international market. Since each country is applying for WTO membership, what are the implications of becoming a member? How have these countries prepared themselves to become members of the WTO? How will WTO membership affect regional trade agreements between the Central Asian countries? Membership into the WTO implies compliance with established regulations and standards, the liberalization of markets for international trade, and the inflow of goods from other countries. Their agreement to become members of the

WTO will require them to adopt equivalent standards of the WTO such as the Agreement on the Application of Sanitary and Phytosanitary Measures (SPS). In order for these countries to prepare themselves to become WTO organization members, they need to remove barriers to trade, establish efficient markets for both domestic and international goods, and discuss bilateral trade agreements with other WTO members. Kazakhstan has had 2 working party meeting. These meetings have and continue to discussed bilateral market access, agriculture, the customs system (and customs union arrangements), price controls, import licensing, industrial subsidies, SPS, technical barriers to trade (TBT), transparency of the legal system and legislative reform, services, and trade-related aspects of intellectual property rights (TRIPS). The next meeting of the Working Party is scheduled to take place in July 2001.

For environmental and sustainable reasons it is important to produce comparative advantage goods that can be traded rather than aiming at food self-sufficiency for each individual country. However, there is also a special need to address political economy issues because the region is transitioning from a soviet style economy to a market oriented economy. In addition, the relationship between individual countries in the region should also be considered along with the trade issues. Furthermore, more research needs to be done in order to understand the implications of forming a regional trade agreement in Central Asia.

6. Conclusion

Food self-sufficiency in Central Asia is not curing the region's problem of food insecurity. Therefore, Central Asia needs to develop bilateral and multilateral trade agreements within the region and outside of the region. Moreover, each Central Asian country should produce goods that they have a market advantage in. Furthermore, policy changes are needed to reflect international standards regarding such items as food safety. Finally, the capacity of farmers, processor, food handlers, and policymakers need to be strengthened in regards to food safety procedures in order for food commodities to be traded on the world market.

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