

FOOD SECURITY AND ENVIRONMENTAL CHANGE IN CENTRAL ASIA

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Abstract:

The Central Asian region has been characterized by substantial environmental and economic challenges. The major environmental issues in Central Asia resulting largely from human causes like deforestation, soil degradation, desertification and nuclear waste. More human interferences have been unbalancing the ecology of Central Asia and push to more natural disasters. Half of the population of Central Asian countries live in poverty and lack sufficient natural resources to sustain their livelihoods, while the countries' wealth is unevenly distributed. The Soviet policies of over exploitation of natural resources especially land and water and more focused on cotton production created the situation of food security. Except Kazakhstan, rest of Central Asian countries struggled for staple food production. Kyrgyzstan and Tajikistan's utmost areas come under mountains where food production is limited. Uzbekistan and Turkmenistan have agricultural lands but cotton production is more preferable here. Last few decades, population rise unconditionally and dependency on neighboring countries make the scenario panic. My research deals with the negative impact of Soviet legacy on local environment and food security in Central Asian countries.

Key Words: Agricultural lands, environmental issues, exploitation, food security and population

Food Security:

To understand the food security we should know about the food system. Food systems are defined as a set of dynamic interactions between and within the biogeophysical and human environments which result in the production, processing, distribution, preparation and consumption of food. They encompass components of food access (with elements related to allocation, affordability and preference), food availability (with elements related to distribution, production and exchange) and food utilization (with elements related to social value, nutritional value and food safety) (Ingram et al., 2005) (Fig. No. -1).

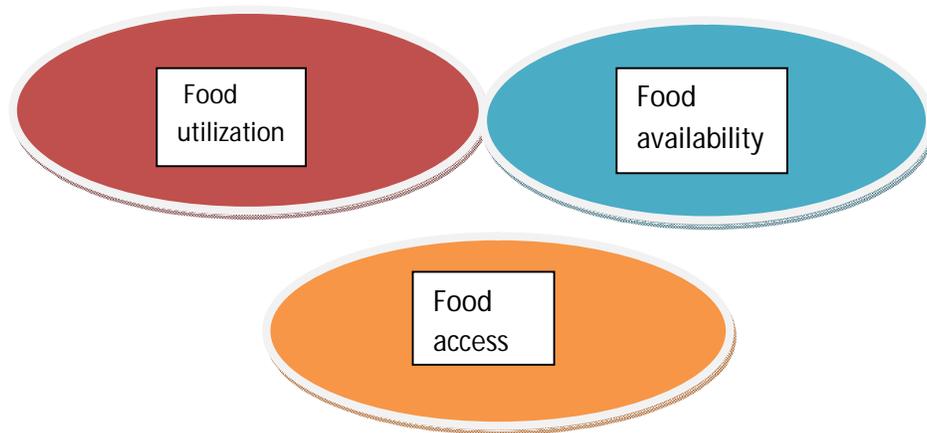


Fig. No.1 – Three components of food systems

Source – Ingram et al., 2005

Food systems underpin food security, which is the state achieved when food systems operate such that ‘all people, at all times, have physical and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life (FAO, 1996). Situations like food security come in existence when there is scanty of food. Food stress can be caused by a range of agents in addition to natural and man- made disasters, climate and other environmental changes. The food systems in Central Asia are changing very rapidly with globalization, urbanization and foreign investments. A variation in climate is one of the relevant factors that affect the security of food. Out of the seven factors, climate/ environment is the important one (Fig. No. -2).

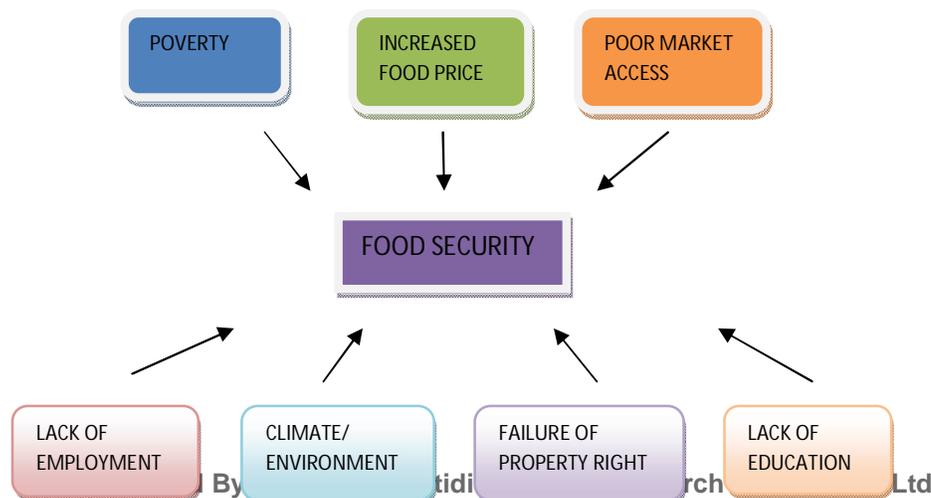


Fig. No.2 – Seven important drivers of food insecurity

Source – Scholes and Biggs, 2004.

WFS defined food security as existing ‘when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life’ (World Food Summit, 1996). Food security is driven by the types of agricultural crops grown, the agricultural practices and the resulting yields, climate change, droughts, pathogens and pests, demographic factors, changing consumption patterns, education and wellbeing of ecosystems around, social fairness within a state, income inequality and access of the poor to food (Sen., 1981). Food insecurity is the big problem especially in the developing countries. The transition countries like countries of Central Asia faced the legacies of the past cause the situation of food insecurity. Before independence, Central Asian countries were dependent on each other and on the other countries of Soviet Union. All the decisions were centralized. Dissolution of various trading agreements after disintegration, the countries of Central Asia faced a choice between self sufficiency in food production and food security through the combination of regional trade and own production. The restructuring of large- sized agricultural fields, industrialized collective farms into small enterprises was a big challenge, as the former employees need much more knowledge to run a farm by their own. The technical equipment used in the former state farms with their large field sizes is now oversized for small farms (Bobojonov, 2009).

Central Asia has harsh physical topography with large areas captured by deserts, mountains and steppes. The climate of Central Asia is continental arid with dry, cloudless and hot summers. Maximum precipitation occurs in spring. Agriculture and animal husbandry are the most important economic activities in Central Asia. Environmentally, Soviet legacy focused on the maximum production without thinking about sustainable use of resource. Kazakhstan is well known for the production of wheat and meat. Uzbekistan, Tajikistan and Turkmenistan are the big supplier of cotton and Kyrgyzstan is known for their wool production. Apart from that, mining of minerals like uranium, gold, coal, mercury and others with the extraction of oil and natural gas is the big contributor in the Central Asian economy. But the changing environment with climate change, rapid population growth, poverty, unemployment, decrease in the production of crops and weak economy creates the situation of food insecurity in Central Asia. The big agricultural fields near to the Aral Sea basin and Fergana Valley are largely affected by

the environmental change which resulted in the scarcity of food. Aridity of climate is the primary cause limiting the land availability for the production of agriculture and livestock in Central Asia. Most of the croplands of Central Asia dependent on irrigational canals which developed in Soviet period are highly vulnerable to climate change because of the desertification and degradation of the arable land. About two- thirds of the Central Asian livestock is dependent on grazing lands but the changing environment cause the reduction of these lands. Climate change in Central Asia can affect the production of food especially due to the temperature and precipitation regimes change which are likely to affect agro- ecological potential and constraints including changing sustainable stocking rates, changes in the area suitable for growing rain- fed production of cereals and other food crops and modifying crop irrigation requirements (Lioubimtseva and Henebry, 2009). According to an agro- ecological zoning study by IIASA (International Institute for Applied Systems Analysis), almost 90% of land in this region has constraints for rain- fed crops: almost 76% of the area is too arid, 4% too steep and 7% have insufficient soils. Out of the total 414 million hectares approximately 45 million hectares are currently used for cultivation of food and fiber crops and more than 14 million hectares require irrigation (Fischer et al., 2005). The increased evapotranspiration due to decreased rainfall and increased temperature in the western part of Central Asia such as Uzbekistan and Turkmenistan leading to the scarcity of water which directly heats the agriculture and livestock production. The estimating consequences from the precipitation and temperature change on the production of food are the potential changes in variability and extreme events like droughts, heat waves, sand storms and heavy rainfall. Increased surface runoff in the mountainous regions accelerates the land slides, soil erosion and floods which have huge capability to destroy the crops.

The rise in Central Asia's food insecurity is an indirect result of a poor macroeconomic environment (Rhoe et al., 2008). All the five countries of Central Asia are still in the process of transforming agriculture into the past soviet context of market oriented production. According to the economic indicators of Central Asian countries, industries and service sectors provide strength to the GDP. Besides these agriculture plays a significant role in society (Table No. -1). The GDP of Central Asian countries as per the 2008 estimation were 11.500\$ (Kazakhstan), 6.100\$ (Turkmenistan), 2.600\$ (Uzbekistan) and 2.100\$ (Kyrgyzstan and Tajikistan).

		KAZAKHSTAN	TURKMENISTAN	UZBEKISTAN	KYRGYZSTAN	TAJIKISTAN
GDP (purchasing power parity)(billion USD)(2008 est.)		\$176.9	\$29.65	\$71.63	\$11.41	\$15.4
Country comparison to the world		57	106	78	144	133
GDP Per Capita						
GDP-per capita (PPP-2008)		\$11.500	\$6.100	\$2.600	\$2.100	\$2.100
Country comparison to the world		96	130	171	184	187
GDP composition by sector	Agriculture	5.8%	10.7%	28.2%	32.4%	23%
	Industry	39.4%	38.8%	33.9%	18.6%	29.4%
	Services	54.7%	50.4%	37.9%	49%	47.6%

Labor force		8.358 million (2008 est.)	2.089 million (2004 est.)	15.28 million (2008 est.)	2.7 million (2000)	2.1 million (2008)
Labor force by occupation	Agriculture	31.5%	48.2%	44%	48%	67.2%
	Industry	18.4%	14%	20%	12.5%	75%
	Services	50% (2005 est.)	37.8% (2004 est.)	36% (1995 est.)	39.5% (2005 est.)	25.3% (2000 est.)
Unemployment rate		6.9% (2008 est.)	60% (2004 est.)	0.9% (2008 est.)	18% (2004 est.)	23% (2008 est.)
Population below poverty line		13.8% (2007 est.)	30% (2004 est.)	33% (2004 est.)	40% (2004 est.)	60% (2007 est.)

Table No. 1- Economic indicators of Central Asian countries

Source – CIA World Factbook

The GDP of different countries shows the economic conditions and the growth. Among five, Kazakhstan is the rich, Turkmenistan and Uzbekistan comes in middle and Tajikistan and Kyrgyzstan are the poorest countries. The agriculture sector is better in Turkmenistan, Uzbekistan and Kazakhstan but over exploitation of the water resources (Syr Darya and Amu Darya) and fertile land leading to the extremely low economic benefit. The agricultural share in the GDP is very few. 28.2% in Uzbekistan, 10.7% in Turkmenistan and so on. These

contributions clearly create questions about food security in Central Asia. But agricultural sector is still an important sector for stability, as still a good amount of labor force of Central Asia is occupied in this: 67.2% in Tajikistan, 48.2% in Turkmenistan, 44% in Uzbekistan and 31.5% in Kazakhstan (FAO, 2008). Specifically concerning Kazakhstan, Turkmenistan and Uzbekistan, these figures should highly determine the point of view and the strategy for any advocacy towards sustainable agriculture: conflicts, risks and labor in the course of environmental degradation, climate change, migration and social stability seem to be promising arguments (Devkota, 2009).

Population growth and increasing demand of food is one of the important causes of food insecurity. The growth of population in Central Asian countries increasing day by day except Kazakhstan because as comparison to other states growth rate of population is little bit slow. According to UNFPA the population of Central Asia will increased from 60.6 million in 2008 to 15 million in 2050 (UNFPA, 2009). This estimation is like a red light for the production, consumption and demand of food. In many regions of Central Asia we saw the environmental degradation due to anthropogenic and natural disaster and its consequences on agriculture and other sectors. The population pressure on natural resources and agricultural fields is a great challenge for Central Asia. So the food security has to be ensured by effective measures in various fields because all are interlinked. Some measures like change in agriculture pattern, sustainable use of resources, better irrigation facilities, improved agricultural techniques, less use of chemical fertilizers, balancing of different sectors, improve the water quality, reduce the pressure on agricultural and grazing lands, better care of our ecosystem and create awareness about food security. Degradation of land, desertification, salinization, overgrazing, radioactive pollution and climate change as well as growth of population will decrease the arability of land per capita which is already low in some of the Central Asian states.

There is negative impact of Volatile food prices on the Central Asian states. International food prices had risen sharply between 2006- 08 (FAO and EBRD, 2008). The risen food prices have had negative impact in Central Asia with inflation. The poor dominated states like Kyrgyzstan and Tajikistan were affected more because from their limited money they had to paid more in food items. A 5% relative increase in food prices could increase poverty rates by 2 to 3% points (Alam, 2008) So that the high price of foods especially for vulnerable and poor people creates

the situation of food security. To reduce the situation of price hike some steps like restrict or ban exports of food and controls domestic price. High food prices in 2007- 08 increased the attention of the government of Central Asian countries to increase the production of cereals. The global food prices were about 24% below April 2008 levels; they were 8 and 9% higher in Kyrgyzstan and Tajikistan respectively (UNDP, 2009). The option of free market zone provides opportunities of marketing and access to fresh and high quality food. Increased growth of population also raised the demand of meat. If the lower of overall consumption of the meat, more effectively cereal yields and agricultural land can be spend for the benefit of human nutrition. As livestock is one of the main sources of greenhouse gases, a change of consumption patterns might create a win- win situation for food security and the mitigation of climate change (Ibragimov, 2009).

We can see the consumption- based measures of poverty and the food security of two countries (Kyrgyzstan and Kazakhstan) of Central Asia in table number- . In this table, except cereal products whose annual consumption increased up to 35% in between 1990- 97 but all other basic food products annual consumption declined. Majority of the decline was in the consumption of feed for livestock in these countries. The demand for the human consumption has not declined; food insecurity is likely to worsen when livestock production does not satisfy the expected future increase in the demand for meat and meat products (Baydildina et al, 2000). In addition to the fall of food grains used as cereals, the food self-sufficiency policy and economic conditions have lead to a 30 percent reduction in livestock production between 1992 and 1997 in Kazakhstan (Pandya-Lorch and Rosegrant, 2000). From 1992-1996, FAO calculated that the percent change in the decline in cattle and sheep for Kazakhstan as 25 percent and 44.7 percent, respectively (Suleimenov and Oram, 2000). Along with the supply of meat declining, the demand for meat and meat products declined from 2.23 million tons to 1.75 million tons during this period. However, the rising population and increasing urbanization is expected to increase the demand form eat and meat products in the future (Pandya-Lorch and Rosegrant, 2000). If we compare the insecurity of food Kyrgyzstan is much higher than Kazakhstan. One of the important reasons regarding this is the changing patterns of cereal production.

	1990	1995	1996	1997	1990- 97

					Difference
Fish and fish products	10.3	4.8	4.6	3.5	-66.0%
Eggs (in pieces)	225	97	70	69	-69.3%
Meat and meat products	73	52	50	50	-31.5%
Vegetables and melons	76	56	52	55	-27.6%
Sugar	38	18.5	17.6	17.1	-55.0%
Fruits and Berries	23	11	10	9	-60.9%
Vegetable oil	11.2	7.6	7.4	6.5	-42.0%
Potatoes	86	70	67	68	-20.9%
Milk and dairy products	311	229	211	196	-37.0%
Cereal products	148	185	185	200	+35.1%
Total	1001.5	730.9	674.6	674.1	-32.7%

Table No. – Average annual consumption of basic food products per capita in Kazakhstan (Kgs).

Source – Baydildina et al, 2000

Increase in the poverty level is a relevant cause of food insecurity in Central Asia (especially Kyrgyzstan and Tajikistan). Some of the important determinants such as head count ratio, calorie method weight short- fall index, aggregate income gap index and the poverty line can be used to measure poverty. The food insecurity of Central Asia is the indirect result of the fall in the national output and high inflation rates during 1990s (Babu and Reidhead, 2000). There is need of macroeconomic stability in Central Asia which is essential for food security because of given

reasons. Firstly, the declining of GDP results in rising poverty and unemployment, and labor productivity fall down, which leads to natural and human resources being wasted. Secondly, medium to high inflation of Central Asia decrease the purchase power of the people, therefore people is unable to purchase significant agricultural inputs to insure their security of food and lastly, diversification of Central Asian agricultural outputs for the domestic and foreign investment macroeconomic stability provides a good opportunities which will effectively use natural and human resources and increase income and employment. The key factors which can help in food security are balance growth of population, demand, food production and economic growth with care about the environment.

Finally, in Central Asia food security is being constrained for some major reasons. First, due to poor opportunities of trading, marketing and low value of agricultural raw materials the non-farm activities have declined which increased unemployment in rural areas. Second, loose self-sufficiency approach and policy for food security will result in the deterioration of the natural resource and situations of food insecurity come. Third, lack of better agricultural output, irrigation facilities and poor allocation of land are push to more resource degradation. Fourth, reduction in foreign exchange due to the closing of borders to trade and commerce resulted in the inefficient use of natural and human resources. Fifth, low level of income due to the reduction in the productivity of crops increased poverty largely in the rural areas. Sixth, increased natural and man- made calamities like degradation of land, salinization, deforestation, soil erosion, floods, droughts, earthquake, landslides, pollution, desertification and climate change creating a big hindrances for food security in Central Asia.

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