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MIRZA NOMMAN AHMED, IRA PAWLOWSKI (EDS.)*

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* Dr. Mirza Nomman Ahmed and Dr. Ira Pawlowski are research assistants at the ZEU and coordinators of the postgraduate programmes “Climate Change Network for Central Asia (CINCA)” and “Land use, ecosystem services and human welfare in Central Asia (LUCA)”. This conference has been organized in the framework of both these projects. In respect thereof, particular thanks goes to the German Department of Foreign Affairs and DAAD for facilitating CINCA) and the VolkswagenStiftung for funding LUCA.

Contact: clinca.ahmed@zeu.uni-giessen.de
ira.pawlowski@zeu.uni-giessen.de

UZBEKISTAN'S AGRICULTURE- STATUS QUO, CHALLENGES AND POLICY SUGGESTIONS

Samarkand Agricultural Institute, shavkat_hasanov@hotmail.com

1 INTRODUCTION

Uzbekistan is a country of vast land with rich natural and oil resources. It is a dry, landlocked country of which 11% consists of intensely cultivated, irrigated river valleys. More than 60% of its population lives in densely populated rural communities. Uzbekistan is now the world's second largest cotton exporter and fifth largest producer, a large producer of gold and oil, and a regionally significant producer of chemicals and machinery.

Uzbekistan's economy depends heavily on agricultural production. As late as 1992, roughly 40 percent of its net material product has been generated in the agricultural sector, although only about 10 percent of the country's land area was cultivated. Agriculture is also the biggest industry, which accounted for 21.7% of GDP in 2007 and employed approximately 28% of labor force (WFP 2008, Hasanov and Ahmed 2011).

Sector growth trends reveal that industry's share of GDP has increased from 14% in 2000 to 24% in 2011 and the service sector from 37% in 2000 to 40% 2011. Agriculture's share of GDP has decreased from 30% in 2000 to 17.5% in 2010. However, agriculture remains important: around 49% of the population is in rural areas and 25% of the national workforce is directly employed in the sector. Moreover, agriculture provides 90% of domestic demand for agricultural products and 70% of domestic trade.

Table 1: The structure of Uzbek economy (% composition in GDP)

Sector	2000	2005	2007	2011
Manufacturing	14.2	21.1	21	24
Agriculture	30.1	26.3	23.2	17.6
Construction	6.0	4.8	5.9	6.1
Transport and communication	7.7	10.6	11.3	11.7
Trade	10.8	8.8	9.4	8.8
Others	31.2	28.4	29.2	31.8

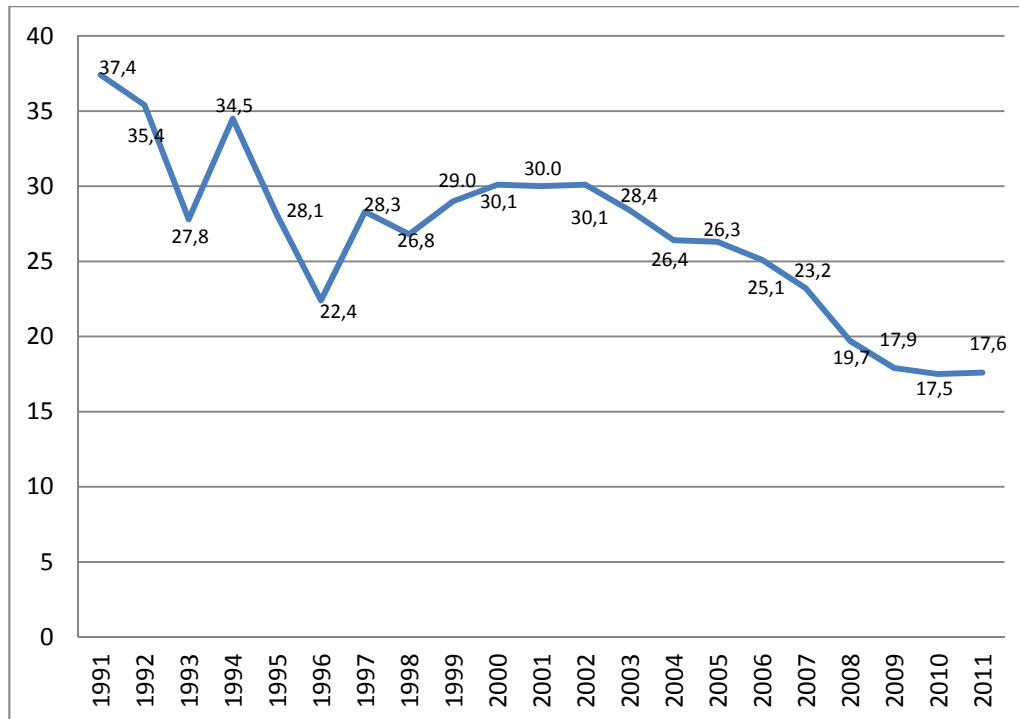
Source: State Statistics committee of Uzbekistan, 2012

2 AGRICULTURAL PRODUCTION

In addition to its contribution to employment and GDP, agriculture is also of vital importance in terms of improvements in rural livelihoods, food security and self-sustainability. After independence in 1991, the country's agricultural system underwent significant structural changes resulting in the fall of total agricultural output to 16% by 1996. However, the implementation of

land distribution initiatives and the engagement of an increasing number of households in agriculture and crop diversification have resulted in a significant increase in output since then, surpassing the levels attained in 1991¹. Structural changes adapted to the type of land tenure available following the restructuring of large collective and state farms have resulted in the formation of private farms and the expansion of small household plots, which are now responsible for much of the growth in agricultural output over recent years, thereby leading to increased household incomes as a result of the strong productivity gains (World Bank Country Note 2010, Cornia et.al. 2003).

Figure 1: The share of agriculture in GDP, in %

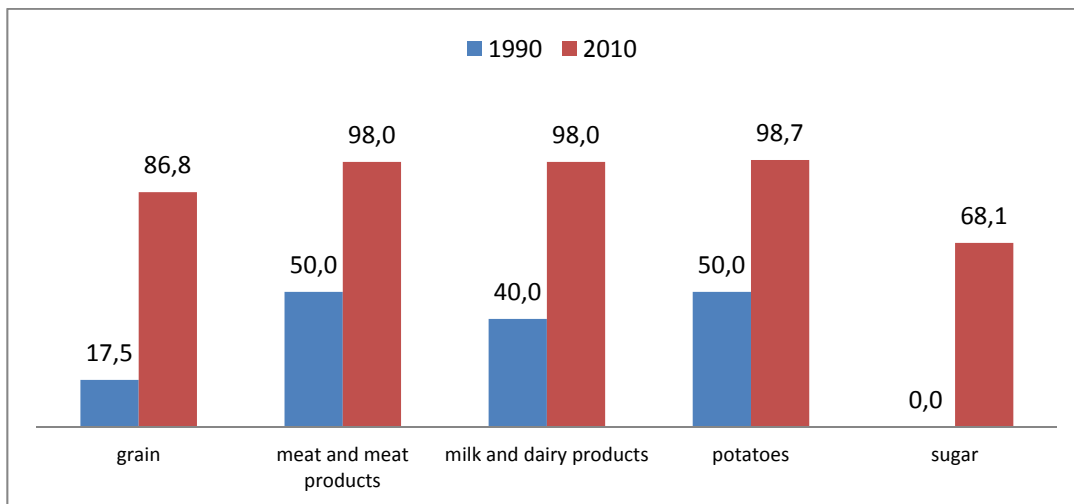


Source: State Statistics committee of Uzbekistan, 2012

Approximately 60 percent of the value of agricultural production comes from the crop sector and the remainder from the livestock sector. Cotton is the most important crop economically. This "strategic crop", produced in irrigated areas throughout the country, accounts for about 40 percent of cultivated land and makes up about 40 percent of export earnings. It makes Uzbekistan the fifth largest cotton producer and second largest cotton exporter in the world. Since independence, and as a result of the self-sufficiency food policy adopted by the Uzbek Government, wheat has become the second "strategic crop". It accounts for about 30 percent of the cultivated area. The rest of the cultivated area is used for growing fruits and vegetables (Uzbekistan continues to be one of the major suppliers of fresh and processed fruits and vegetables in the region), in addition to potatoes, tobacco and fodder crops. Animal husbandry in Uzbekistan is specialized not only in production of foodstuffs (meat, dairy products, eggs) but also in the production of raw materials that include cocoons of mulberry silkworms and karakul that are highly demanded in the world markets.

¹ World Development Indicators, 2009, The World Bank

Figure 2: Self-sufficiency of major agricultural products



Source: State Statistics committee of Uzbekistan, 2011

With regard to food consumption, there have been significant changes over the years. In the 1990s, the country imported over 82% of the total consumption of grain, 50% of the meat and meat products, 60% dairy products, 50% of potatoes, 100% of sugar and powdered milk and baby food. Nowadays Uzbekistan provides its own population all basic food products in the necessary volume in almost all products due to the development of domestic production (with the exception of sugar).

Estimates suggest significant differences in income and food consumption between urban and rural areas, with lower levels in rural areas, and hence there is an obvious case for concentrating policy on this imbalance. It is apparent that actions aimed at rural economic growth will have agriculture at their core, but emphasis on the wider rural economic development will also be important since, worldwide experience shows that agricultural growth alone is insufficient to raise rural income substantially. This is because agricultural earnings accrue mainly to those with access to the key factors of production (land and water) and because the linkages between agricultural growth and incomes in the rural sector as a whole are weak. As a result, addressing non-agricultural incomes and, hence, non-agricultural income sources is essential in rural development.

In 2010 agricultural output was valued at US\$8.9 billion and accounted for 21% of exports. While cotton and grain are the most important crops in Uzbekistan, horticultural products contributed significantly to Uzbekistan's agricultural output in 2010. Table 4 below shows the contributions to GDP by agricultural product type for the period 1990 – 2010.

Table 2: Shares of major agricultural products in GDP (%), 1990-2010

Measurements	1990	2000	2010
Share of agriculture in GDP	33.4	30.1	17.5
Row cotton	15.9	3.6	19
Grain	1.4	3.4	2.0
Potato	0.3	0.8	1.4
Vegetables	1.3	2.4	2.3
Melons	0.5	0.3	0.3
Fruits	0.7	0.9	1.1
Grapes	0.8	0.8	0.9

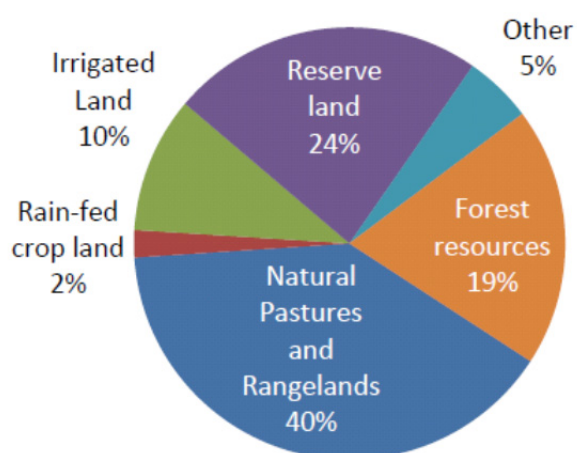
Source: MAWR –Ministry of Agriculture and Water Resources of Uzbekistan, 2011

Significant contributors to horticultural production are dekhan farms, which are small allocations of up to 0.35 hectare on irrigated lands, 0.5 ha on non-irrigated lands and 1 ha on land classified as desert. According to the State Statistics Committee, dekhan farms, originally introduced by Government as a food security measure whereby small-scale farmers as private sector operators could grow for their own subsistence and sell surpluses to local markets, accounted for a 63% share of total agricultural output in 2010 off 0.47 million ha of land. Private sector agriculture also includes leasehold farms made available under Government's land reform and rural restructuring policies. There are around 81,000 private leasehold farms in the country, more than 1.5 million people employed on these lands, with an average size approaching 150 ha. In 2010 private farms accounted for 35% of total agricultural output off 3.14 million ha (IFAD 2010).

3 AGRICULTURAL LAND USE AND MANAGEMENT

A large area of land is used for agriculture in Uzbekistan; with natural pastures occupying 40% of the country and rain-fed and irrigated cropland accounting for an additional 12%² (Figure 3). More than 85% of Uzbekistan's cropland is irrigated, comprising approximately 10% of the land area of the country.

Figure 3: Land use in Uzbekistan



² Centre for Hydrometeorological Service, Cabinet of Ministers, 2008. Second National Communication of the Republic of Uzbekistan under the United Nations Framework Convention on Climate Change, Tashkent

Source: Centre for Hydro-meteorological Service, Cabinet of Ministers, 2008.

Main agricultural areas are located in the basins of the Amu Darya and the Syr Darya rivers, which supply about 70% of irrigation water. Large expansion of irrigated lands during 1960s to late 1980s resulted in excessive water takeoff from these rivers causing drying out of the Aral Sea, increasing soil salinity, and other adverse environmental impacts (WFP 2008).

Farming is conducted by renting land in a permanent rental system. Since privatization of land has not been enforced, land is state-owned, except for special cases where law is enacted. Of the total land area, farmland is about 22,260,000ha (50%) and arable land is 4,050,000ha (9%). In 2008, about 2,750,000 people worked in agricultural sectors and of the total population, 63% were living in rural areas. Major agricultural products are wheat and raw cotton. As a raw material to export finished textile products, raw cotton is the major earner of foreign currency in Uzbekistan. Wheat is also an important crop for food self-sufficiency and is mostly produced to fulfill domestic demand.

Of the total crop cultivation area, wheat accounts for about 90% of the area and is grown on 1,380,000ha. As the biggest export product in agriculture, Uzbekistan's raw cotton ranks 5th in the world in terms of production volume following the U.S, India, China, and Pakistan and ranks second in terms of export volume. About 60% of its population is working in the raw cotton industry and in 2010, raw cotton accounted for about 20% of Uzbekistan's total export volume. As for the farming sector, the government has focused on increasing productivity and income through efficient marketing of raw cotton and wheat.

Table 3: Sown area of crops (1,000ha)

	1991	2000	2005	2011
Sown area, total	4,200.3	3,778.3	3,647.5	3,601.2
of which wheat	487.2	1,355.8	1,439.7	1,432.6
rice	159.6	131.8	52.5	23.1
maize	107.7	49.2	33.6	26.5
of which cotton	1,720.5	1,444.6	1,472.3	1,329.2
of which potatoes	40	52.2	49.8	73.6
vegetables	165.6	130	137.7	175.4
forage crops	1,065.7	429	290.3	313

Source: State Statistics committee of Uzbekistan, 2012

By area, cotton and wheat are by far the two major crops grown in Uzbekistan. Smaller areas are occupied by fodder crops, grapes, apples, barley, tomatoes, potatoes and rice. Although the area

occupied by fruit and nut trees is relatively small in comparison to wheat and cotton, the prevailing climatic conditions are suitable for the expansion of their production area.

At commodity level, cotton lint, cattle meat, cow milk, wheat, tomatoes, grapes, and cottonseed made the most significant contribution to the average value of agricultural production in Uzbekistan from 2005-2007. Approximately 60% of the value of agricultural production is derived from the annual and perennial crop sectors, while the livestock sector produces the remaining 40%. Although field crops like cotton and wheat are grown extensively and occupy a large percentage of the cropping land, other crops like tomatoes, grapes, potatoes and apples make a significant contribution to the value of agricultural production on a proportional basis, as they can garner higher price³ (UNDP 2010).

Table 4: Production of principal agricultural crops, 2004-2009 (1,000 tons)

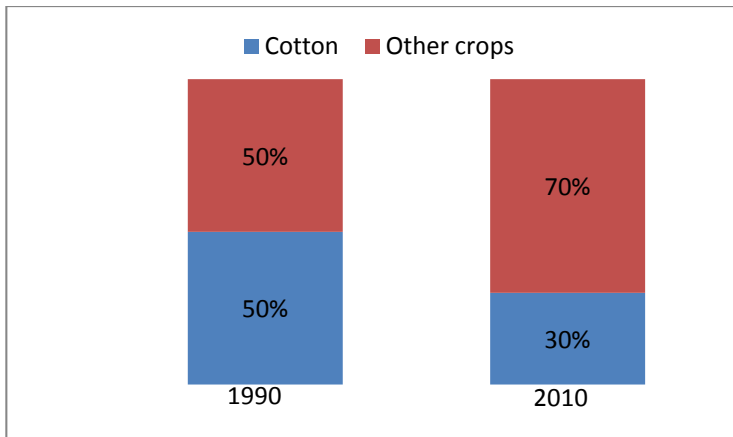
Crop	2004	2005	2006	2007	2008	2009
Cotton fiber	977	1,184	1,171	1,300	1,270	
Wheat	5,508	5,928	5,996	6,076	6,039	6,638
Vegetables	3,336	3,517	4,294	4,691	5,221	5,704
Potatoes	896	924	1,021	1,189	1,398	1,524
Fruit and berries		949	1,182	1,270	1,402	1,542
Grapes	589	642	804	879	7,925	899
Cattle and poultry	998	1,060	1,139	1,140	1,209	1,367
Milk	4,281	4,555	4,855	5,097	5,426	5,779

Source: State Statistics committee of Uzbekistan, 2010

During 1991 to 2011, sown area decreased by almost 600 thousand hectares. This is due to poor amelioration condition of soil, which forced the withdrawal of affected farm lands out of agricultural production. There have been significant changes in the structure of sown areas of crops. By reducing the area under cotton and forage crops, it was able to increase the share of areas under potatoes and vegetables and melons from 7.0% in 1991 to 8.2% in 2011; and grain crops from 25.7% to 44.6 % during the same period. Within the irrigated area too, this shift is vivid as depicted in Figure 10 below. The share of cotton fields in total irrigated areas has declined to 30% in 2010 from 50% in 1990, whereas the share of other crops rose to 70% during the same period. Accordingly, this trend is a clear indication of policy shift towards water-saving strategies in the country.

Figure 4: Share of cotton and other crops in total irrigated land (1990-2010)

³ <ftp://ftp.fao.org/agl/agll/docs/fertusezbekistan.pdf>



Source: State Statistics committee of Uzbekistan, 2011

Such shifts have also made it possible to avoid shortages and rising food prices in the face of global financial crisis. Development of selected seed varieties, the use of new high-yield varieties of crops, and improvements of agriculture technologies have led to significant increases in the yield of food crops during the period 1991 to 2011 (Table 5).

Table 5: Average yield agricultural crops in all types of farming (ton/ha)

Products	1991	2000	2005	2010	2011	In 2011 comp. to 1991, %
<i>Cotton(raw)</i>	2.70	2.18	2.53	2.56	2.63	97.4
Wheat	1.25	2.76	4.15	4.65	4.78	382.4
Potato	8.70	12.93	17.03	19.19	19.60	225.3
Vegetables	18.80	18.38	21.58	25.54	26.36	140.2
Fruits and berries	3.67	5.69	6.23	9.29	9.78	266.5
Grape	5.09	6.31	6.47	9.22	9.82	192.9

Source: State Committee of Statistics of Uzbekistan, 2012

Cotton production has great importance in achieving sustainable economic development of the country. It is quite well known that Uzbekistan is one of the leading producer and exporter of cotton in the world. Cotton fiber provides substantial part of the country's foreign currency earnings. As was indicated earlier, the production of cotton in the period 1991 to 2011 decreased by 24.7% due to the significant reduction of cultivated areas aimed at increasing food grain production for a rapidly growing population.

After independence, the government has set up strategic objective of ensuring the nation's food grain self-sufficiency. As a result, grain has now become one of the leading agricultural crops. During the 1991-2011 irrigated area under cereals increased by 5.2 times, the yield - 3.8 times, gross yield by 3.7 times, and the realization of the grain for state needs use by 19.6 times. While the rise in the number of modern combines reduced the duration of the season harvest, resulting in significantly reduced yield losses, it has led to "food grain independence" within a relatively short period turning Uzbekistan from a net grain importer to a net exporter.

As a result of the changes in recent years, climate and population growth in the world increased demand for horticultural products, potatoes, and other foods. Over the period 1991 to 2011, potato production has increased by 5.3 times, other vegetables by 2.5, melons by 1,4 times, fruit and berries by 3.6 times and grapes by 2.3 times. As a result, these crops have not only fully satisfied the needs of the country, but also to ensure their exports.

In recent years volume of commodity processing has also increased. Over the past five years, farmers, agricultural companies, processors and entrepreneurs have been importing small-scale technologies from abroad for processing fruits and vegetables. As a result, the volume of processed products increased by almost five-fold. Also the rapid creation of gardens for intensive farming production (intensive gardens) is being reconstructed in the degraded land areas, gardens and various farms.

The amount of the water used for the irrigation is now reaching the limit of available irrigation water supply, decided by the related countries. Moreover, since the independence, the irrigation and drainage facilities have not been properly maintained, managed or rehabilitated by water users association due to lack of funds. The capacity of these facilities is getting lower and lower. This situation is further accelerating the advance of salt damage. In future, in addition to paying heed to excessive groundwater development, the important tasks are the proper management of facilities through measures such as creation and use of the most effective irrigation areas, renewal of aging irrigation facilities, maintenance and management, planned utilization of water resources, and water saving cultivation techniques development. Although the maintenance and management of all irrigation waterways except trunk ones were transferred from government control to newly established water users' association, they are not functioning well due to financial difficulties and the lack of machinery and technology.

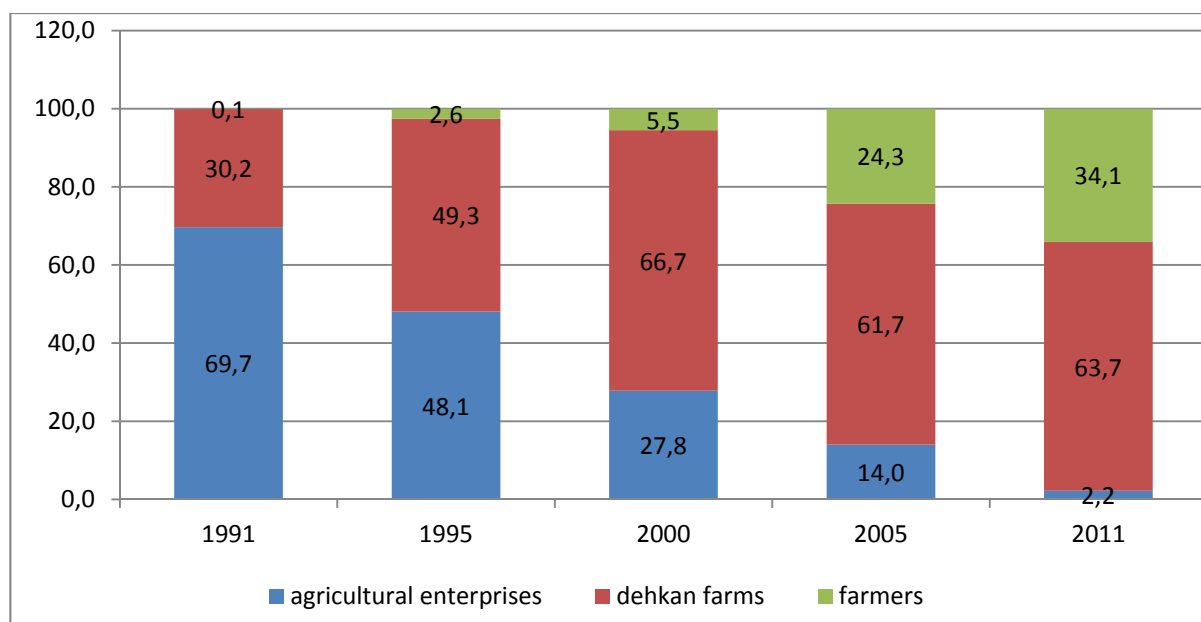
4 ORGANIZATION OF AGRICULTURAL PRODUCTION

After that, parts of the *shirkat* were split and privatized, and a large number of smaller private farms were born. The October 2003 presidential decree called for policies to split and dismantle inefficient *shirkat* and turn them into *private farms* by 2006, which is accelerating the country's efforts to privatize the agricultural sector.

There also existing household farms(*dehkan*), whose grows crops with a plot of less than 0.35 ha allocated to each family or raising livestock for their personal consumption⁴. They are allowed to sell excess produce at bazaars to earn cash. These function as a sort of safety network alongside the agrarian reforms.

Figure 4: Production structure by type of farms, % (1991-2011)

⁴ Dehkan farms comprise very small land plots which average 0.17 ha and cannot exceed 0.35 ha if irrigated or 1 ha if unirrigated



Source: State Statistics committee of Uzbekistan, 2012

During the period 2003-2006, the government's agricultural policy was concentrated on private farming sector development, setting up of market and production infrastructure, improving provision of advance loans to farmers for agricultural production, and establishment of various forms of cooperatives by farmers.

The market and production infrastructure development was designed to service the newly emerging farming sector. Companies providing plowing and planting, veterinarian, insurance and mini-banks services, as well as supplying chemical fertilizer, fuel and lubricants are being established everywhere. As a result, private farmers' access to these services has been improved significantly. At the same time, there is huge untapped potential in developing the procurement system and improving the functioning of wholesale agricultural markets. Despite reorganization in progress, there still remains a lot to be done in terms of creating water user systems in compliance with market reforms and enhancing the effectiveness of the Water Consumers' Association.

Efforts to broaden and deepen the agrarian reform in the country create ample opportunities for the development of farms. During the implementation of the reforms a number of laws, decrees of the President of the Republic of Uzbekistan and the Cabinet of Ministers were adopted on the organization and development of farms. These reforms were primarily devised to support the development of farms and the necessary organizational, economic and legal conditions of land and water relations, financial and credit mechanism, the formation of the material and technical base of farms, service and legal services, and to improve the system of production, processing and marketing, and labor relations and activities in the field of training. Farmers as the main producers of agricultural products imposed today hope to increase the volume of production at the intensive basis, enhancement of processing of agricultural products, improve the profitability of agriculture, which ultimately will significantly raise the level of living in the countryside. In order to strengthen the economic interest of agricultural producers, the government has facilitated the simplification of accounting and relief to farmers in the form of payment of the single (unified) land tax return

payment together with all applicable national (except excise tax) and local taxes and fees to agricultural producers. Additionally, for newly established farms, tax-free privileges of two years are given for lands. In the case of development of unused farm land, it is exempt from the single land tax for a period of five years. Farms specializing for cultivation of fruits and grapes are also exempt from the single land tax for a period of five years. Imports of farm inputs and foreign technological equipment for own use, are similarly exempt from customs duties.

5 OBSTACLES TO UZBEKISTAN'S AGRICULTURAL DEVELOPMENT AND MARKETING

For decades Uzbekistan irrigation water consumption has exceeded natural river flows, contributing to the desiccation of the Aral Sea. The use of irrigation water has not been efficient, and using high levels together with poor drainage have contributed to *salinity problems*. Such an irrational water use during the last 40-50 years has caused the biggest environmental crisis in the region – the drying up of the Aral Sea. According to one assessment, the Aral Sea crisis has led to direct and indirect socioeconomic costs totaling US\$144 million (nearly US\$5.7 per capita or 1.8% of GDP)⁵.

Uzbekistan has identified a number of adaptation options for agriculture, including improvement of weather and climate monitoring, development of new adapted varieties, improvement of agronomic practices including minimum tillage, increase in water efficiencies and catchment management involving all stakeholders, improvement of pasture and fodder, and development of new livestock breeds. It is in the early stages of integrating these options into agricultural policies and practices at a farm level and of moving from a “top down” support delivery system to one that is demand driven and pluralistic. Its agricultural strategy objectives concern the maintenance of export revenues, food security and improvements in rural living standards. Uzbekistan has moved with land reform, creating a favorable environment for private farmer investment in land productivity.

There are ongoing programs to improve irrigation and drainage management and wetland rehabilitation, especially near the mouth of the Amu Darya River, to improve water management in the fertile Ferghana Valley, and to encourage farm productivity and agri-business development including improving the appropriate environment for financial access. These programs will improve resilience, especially if combined with further measures to liberalize the agricultural economy.

The total area of agricultural land consists of 17.8 million hectares, of which 25% is arable land. In the last 15 years the area of agricultural land decreased by more than 5%, and in per capita terms by 22%, mostly due to the creation of pastures, orchards, and vineyards. On average, there are 8 persons per each hectare of irrigated land. Demographic growth rates are far ahead of those of irrigated land, which has led to a reduction in irrigated farmland from 0.22 ha down to 0.13 ha per person. According to ADB estimates, if the current trend persists, the acreage of irrigated land will further decrease by 20-25% in the next 30 years⁶.

⁵ UNDP, “Water – a critical resource for the future of Uzbekistan”, Tashkent, 2006

⁶ UNDP, “Water – a critical resource for the future of Uzbekistan”, Tashkent 2006

At the same time, the quality of agricultural land is deteriorating. Between 1990 and 2000, the average land quality grade fell from 58 to 55 (in bonitet score⁷). More than 3 million hectares of land is affected by soil erosion caused by wind and water – the average losses of fertile layer in a season has reached up to 80 tons per hectare. Area of pastures subject to erosion, which resulted from overgrazing, constitutes 7.4 million ha, while more than 5 million ha of pasture land is affected by desertification. Problems related to water and wind erosion are worsening because of the reduction in the area of forests, which fell from 8.5 million ha in 2000 down to 8.1 million ha in 2004. About 54% of the land is polluted by pesticides, and more than 80% has a high content of pollutants (IMF 2008).

Considering the limited land resources in the country, reductions in arable land per capita is likely to become a long term trend, and calls for strategic actions to be taken to enhance the effective use of limited land resources. According to World Bank estimates, annual losses in agricultural output in Uzbekistan due to land salinity/degradation are estimated to equal US\$31 million, while the economic losses due to agricultural land taken out of use equals roughly US\$12 million⁸. Activities to reduce land salinity incur major financial costs as well as labor, water, and technical resources. Even with government support, there is an acute shortage of funding for land rehabilitation, preservation, and enhancing yields. Today at least half of all irrigated land is in immediate need of improvement (rehabilitation).

About half of the irrigated lands is supplied with water by pumping stations. The total area of irrigated land in the reconstruction of irrigation systems requires about 36% from total, needs works on reclamation of melioration, through construction, and repairing of vertical drainage for draining saline water. This will assist in keeping lower the underground water level and the salinity degree.

There are also some problems related to pasture use. There have been trends of imbalance in the way pasture is used, wherein some pasture lands are extensively used for grazing leading to overgrazing while others are under-grazed. This, together with the unfavorable ecological situation in the area of the Aral Sea, leads to the degradation of pastures as the natural forage. In addition, population growth and the transformation of irrigated farmland into settlement expansion leads to the utilization of new and often non-suitable land for agricultural production. All these are associated with significant logistical costs. As a consequence it leads to reduced economic efficiency of agricultural production. Aside lands do not only reduce alfalfa forage for livestock, but also adversely affect the level of soil fertility, and hence the yields of major crops like cotton and wheat.

The infrastructure required for expansion of extension services has been put in place. However, the service provided to farmers is still insufficient. The existing infrastructure is largely limited to providing farm management and execution of activities related to technological processes. Certain infrastructure does not meet the needs; organized mini banks did not fully provide services to farmers as almost a third of them do not have internet connection; some of the sources on the realization of mineral fertilizers and fuel is not repaired and not equipped with modern equipment; most of the networks on the harvesting agricultural products and their implementation, as well as

⁷ Land quality rating, relating to potential production of a basket of crops, best land awarded 100 points.

⁸ World Bank, "General state of the environment", 2002

networks to provide information and consulting are not financially stable. Currently, the service sector is experiencing difficulties due to lack of funds as well as ineffectiveness of the tax system. These reduce the efficiency of agricultural production and worsen the unemployment issue and the standard of living of the rural population. They can also lead to imbalances in the supply and demand for certain types of services.

In view of the demand for agricultural products, there is a need to develop new and highly productive crop varieties, improve the soil and climatic conditions of the regions, introduce modern farming techniques, provide local small tractors and agricultural machinery for the production of horticulture, viticulture, fruit and vegetables, etc. There are a number of difficulties in the implementation of and effective control over the quality of exported agricultural products. Lack of testing facilities and laboratories that meet to the international standards is also an area that requires attention.

Other issues that need to be addressed to enhance the role and importance of agriculture in the country's life include increasing the area of irrigated land, controlling pests and diseases, and improving logistics services in the agricultural sector.

Other unresolved problems are as listed below.

- Existing legislation is insufficient to establish a framework to promote self-management by farmers and support their activities, since they are mainly focused on increasing production. In addition, there is no unified basic law for regulating all trends of the sector.
- In spite of the measures taken to optimize farm size, there is problem of fragmentation of land, which does not allow for the use of well-planned crop rotation aimed at high yields and increase in funds for the purchase and use of a modern cost-effective technology
- Procurement prices for agricultural products are quite low compared to the growing costs. The main reason for this is the increase in the cost of fuel and fertilizer
- Bank loans are an important tool in the initiation and implementation of business plans by farmers, and acquisition of modern equipment and technology. But farmers are not willing to use the bank services despite their perceived benefits, since the applicable interest rates are quite high given their financial situation. There are difficulties in obtaining credit due to the high collateral requirement.
- Amelioration conditions of irrigated land are of great concern.
- The lack of stable and long-term partnerships with suppliers and processors, as well as customers in the domestic and foreign markets is also of concern.
- The relative high dependence of the republic on the water from neighboring countries.
- Limited capacity and dispersion of the internal market and the low purchasing power of the traditional markets of the CIS countries.

6 POLICY RECOMMENDATIONS FOR UZBEKISTAN'S AGRICULTURAL AND MARKETING DEVELOPMENT

MAJOR POLICY SUGGESTIONS

AGRICULTURAL PRODUCTION AND PRODUCTIVITY

The constraints related to agricultural production in Uzbekistan include less diversification and excessive dependence on water from neighboring countries. Moreover, soil fertility has fallen down on quality scores, which has reduced efficiency of production and productivity. Although measures have been taken to optimize farm size, there is problem of fragmentation of land, which restricts the possibilities for evidence-based crop rotation aiming at high yields, and limits the ability of farmers to raise their incomes and enhance the purchase and use of modern and cost-effective technology.

Consequently, diversification of crop types according to agro-ecology is helpful. Taking into account the prediction that the reduction in the arable land and deterioration of the existing land resources are to continue, there is a need for implementation of strategies, which aims at enhancing the effective use of the available limited land areas.

QUALITY OF LAND RESOURCES AND IRRIGATION

The constraints identified in this topic include inefficient use and overuse of water, poor drainage, salinity problem, poor amelioration efforts, escalation of soil erosion and deterioration of soil fertility. Accordingly, broadening measures like improved agronomic practices, water efficiency, catchment management, which are already being implemented by the government but still insufficient, are recommended to improve the situation.

SLOW PROCESS OF REFORM IMPLEMENTATION

Despite various measures and reforms the government is taking, the implementation is very slow and far too little to have meaningful effects. Especially the marketing liberalization is very sluggish. Moreover, the privatization process has been too slow. Hence, there is an urgent need to broaden and deepen the liberalization process especially in the marketing sector. Moreover, fostering public-private partnership in the implementation of these processes would be beneficial.

R&D AND EXTENSION SERVICES

The R&D activities for modern technologies are not consistent with the needs of production. The extension services are not sufficient and the extension network is very limited. Accordingly, there is a need to strengthen the link between research and extension. Moreover, enhancing the effective transmission and dissemination of research outputs and technology to farmers is required. There is also a need to increase investment in research institutions and capacity building.

7 CONCLUSION

Uzbekistan is a country with agriculture still contributing a good share in the overall economy of the nation despite its consistent decline in its contribution. The development of the sector has been constrained in many fronts including the slow transition of coming out of a command-type of economic policy from the past, problems related to degradation of land resources (salinity problems and deteriorating soil fertility), natural calamities like the drying up of the Areal Sea and the

associated problem of dwindling water sources for irrigation, infrastructural problems in rural areas and underutilization of existing infrastructure, underdeveloped agricultural marketing system and associated inefficiencies, etc.

Traditionally the agricultural production in Uzbekistan has been dominated by cotton and wheat cultivation and is as such less diversified. However, following a series of reforms that have been implemented over time since independence, the sector has been increasingly diversifying away from these major crops to other subsectors with high potentials for income generation of farmers. In particular, the growth of incomes overtime has brought opportunities for the cultivation and marketing of high-value agricultural products including fruits, vegetables and livestock products. This further enhances related agro-processing businesses through forward and backward linkages.

The policy suggestions are proposed for implementation in phases/stages; namely, the initial/preliminary stage (to stimulate the development and introduction new varieties of plants and breeds of animal, agro-technology and enhance the productivities of crops and livestock); the diversification stage (to enhance the structure of sown areas through increasing areas under competitive crops); take-off stage (to create new enterprises based on modern technology and technological renovation export and processing agricultural products) and finally, maturation stage (for the implementation of measures to promote sustainable development and modernization of agriculture). Specific recommendations were given pertaining to some of the constraints identified; namely, agricultural production and productivity, quality of land resources, irrigation, reforms, R&D, extension, rural finance, and agricultural marketing.

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