Crop Production and Productivity Variations in Uzbekistan with Special Reference to Grain Crops

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Abstract
Uzbekistan is a landlocked country in Central Asia, with a total geographical area of 447 400 km². The country gained its independence from the Soviet Union in 1991. Due to favourable climatic conditions for crop production, agriculture has long been considered one of the priority areas of the economic development. The country's economy depends mainly on agricultural sector. As late as 1992, roughly 40 percent of its net material product (NMP) was in agriculture, although only about 10 percent of the country's land area was cultivated. Uzbekistan restructured Soviet type of collective farms after independence and such efforts contributed to the growth of private sector's share in agricultural production. The two dominant crops grown in the country are cotton and wheat. Both the crops are important for the country, wheat for domestic use and cotton for exports. However, after independence much importance has been given to grain crops especially wheat to meet demand of the domestic food consumption. The present study analyzes the growth patterns in grain crops mainly wheat, rice, barley and corn for a period of 27years i.e. 1991-2017 and thereby analyses yearly productivity variations and that way review the stability of crop production.

Keywords
Agriculture, Arable land, Yield, Production,Modern Technology, Salinity, cultivated Area.

Introduction

Agricultural sector plays an important role in the overall economic development of the Republic of Uzbekistan. Recent estimates reveal that agricultural variable provides employment to nearly 60% of the rural population. This sector forms a base for the development of leading industries in Uzbekistan and is one of the main sources of export resources and hard currency earnings in the country. Agriculture sector accounts for 16.6% of the GDP, 25.9% of all labour force and 13.65 of export earnings. Agriculture and allied industries primarily those related to cotton and foods have consistently contributed to Uzbekistan's gross domestic product.

Table 1
Agricultural Share

Sector	Agricultural Share
Employment	25.9%
GDP	16.6%
Export	13.6%

Source: CIA World Fact book

In the recent years, share of agriculture in total GDP of the Uzbekistan has declined from 30.1 % in 2000 to 21.7 % in 2007, and 16.6% in 2016. However, over the same period agricultural production rose steadily at annual rates of 6% to 7%. The declining share of agriculture in the GDP of the country is mainly due to higher growth rates in other sectors of the economy (UNDP). Official statistical data indicates that between 1995 and 2006 the gross production of grains increased by 103.6 %, pulses 350 %, potatoes 132 %, meat 33.5 %, and milk 32.5 %(UNDP).

Table 2
Land use

Total land		Percentage
Agricultural Land	Arable land	10.1%
	Permanent crops	0.8%
	Pasture land	51.7%
	Total agriculture land	62.6%
Forests		7.7%
Other		29.7%
Total		100%

Source: CIA World Factbook

Fig 1
Land use Spectrum in Uzbekistan

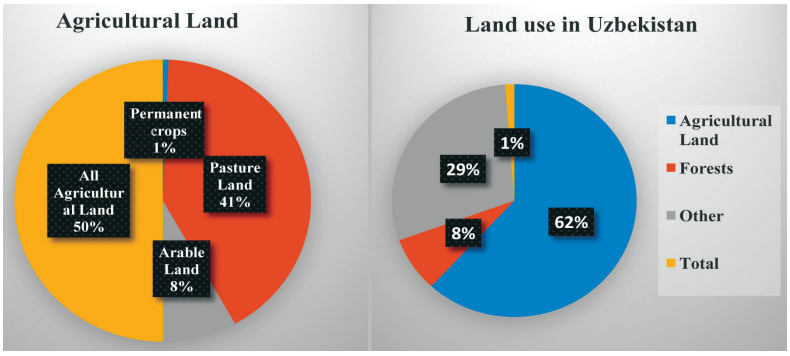

Figure drawn on the basis Table 2

In Uzbekistan, the basic land use categories are Arable Land, permanent crops, hay field, pastures, forests and composite lands. Figure1 provides an overall view of the land use spectrum in the Republic. Out of total land area of 44740000 hectares, 62.6% is devoted to agricultural use which includes 10.1% arable land, 0.8% permanent crops and 51.7% pasture land. Forests occupy around 7.7% of the land area of the Republic and 29.7% is used for other purposes (Table 2). In Uzbekistanonly 11 percent of the land area is suitable for agriculture and cultivation of crops. Majority of the cultivated areas is irrigated by the by well-planned irrigation system.

Table 3
Area under Different Crops

Crop	Area
Grain Crops	1.676 Million Hectares
Industrial Crops	1.286 Million Hectares
Potatoes	87,400 Hectares
Vegetables	230,500 Hectares
Melons	60,600 Hectares
Fodder Crops	352,000 Hectares
Gardens Was	283,400 Hectares
Vineyards	133,000 Hectares

Source: USDA

Materials and Methods

The present study has been carried out by using secondary data. Secondary data on yield and production of grain crops for a period of 27 years from 1991 to 2017 were obtained from the publications of the Govt. of Uzbekistan, different year books of Food and Agricultural Organization (FAO), United States Department of Agriculture (USDA) and CIA World Fact books. The data has been analysed and interpreted through tabulation and simple percentage methods.

Percentage growth rate has been used to measure yearly growth rate in production and yield over the study period (1991 to 2017) by using the following formula:

$$PR = \frac{(V\ Present - V\ Past)}{V\ Past} \times 100$$

Where: PR = Percent Rate
V Present = Present or Future Value
V Past = Past or Present Value

Results and Discussion

The main grain crops of Uzbekistan are wheat and barley. There are intense efforts for converting arid areas into agricultural areas through wheat and barley cultivation, so that area under grains is increased. Corn is another important food grain, generally cultivated on irrigated tracts of the Republic. Other important grain crops grown in Uzbekistan are rice, sorghum and millet, but theirproduction is low as compared to wheat and barley.Poor yield is the main cause of low grain production. Increased salinity of the soil, lack of modern technology and equipment, poor weed control measures are the main causes of low yields in grains.

Among industrial crops cotton is Uzbekistan's main crop.The country is among the world's 10 largest cotton producers. During the recent years the number of cotton plantations have been reduced to diversify its production into cereals, as such area under cotton plantations has been reduced. Large tracts of cotton growing areas has been replaced with food grains mainly due to the primary importance given to the food crops.

Table 4

Wheat, Rice, Barley and Corn - Growth in Production and Yield

Year	Production (MT)				Percentage Growth Rate				Yield (MT/Hectare)				Percentage Growth Rate			
	Wheat	Rice	Barley	corn	Wheat	Rice	Barley	Corn	Wheat	Rice	Barley	Corn	Wheat	Rice	Barley	Corn
1991	610	327	324	431	---	---	---	---	1	3	1	4	---	---	---	---
1992	950	338	360	367	55.74	3.36	11.11	-14.85	2	3	1	4	100.00	0.00	0.00	0.00
1993	800	268	292	404	-15.79	-20.71	-18.89	10.08	1	3	1	4	-50.00	0.00	0.00	0.00
1994	1350	281	300	276	68.75	4.85	2.74	-31.68	1	3	1	3	0.00	0.00	0.00	-25.00
1995	2350	191	321	181	74.07	-32.03	7.00	-34.42	2	2	1	3	100.00	-33.33	0.00	0.00
1996	2700	284	203	137	14.89	48.69	-36.76	-24.31	2	2	1	3	0.00	0.00	0.00	0.00
1997	3100	225	150	139	14.81	-20.77	-26.11	1.46	2	2	2	3	0.00	0.00	100.00	0.00

1998	3600	206	142	160	16.13	-8.44	-5.33	15.11	3	2	1	3	50.00	0.00	-50.00	0.00
1999	3700	248	120	165	2.78	20.39	-15.49	3.13	3	2	2	3	0.00	0.00	100.00	0.00
2000	3600	99	120	55	-2.70	-60.08	0.00	-66.67	3	3	2	3	0.00	50.00	0.00	0.00
2001	3400	44	200	30	-5.56	-55.56	66.67	-45.45	3	2	3	2	0.00	-33.33	50.00	-33.33
2002	5000	114	200	150	47.06	159.09	0.00	400.00	4	3	3	4	33.33	50.00	0.00	100.00
2003	5400	217	150	145	8.00	90.35	-25.00	-3.33	4	3	1	4	0.00	0.00	-66.67	0.00
2004	5250	118	220	155	-2.78	-45.62	46.67	6.90	4	3	3	4	0.00	0.00	200.00	0.00
2005	5800	108	240	160	10.48	-8.47	9.09	3.23	4	3	3	5	0.00	0.00 %	0.00	25.00
2006	5850	143	240	160	0.86	32.41	0.00	0.00	5	4	3	5	25.00	33.33	0.00	0.00
2007	6200	130	240	160	5.98	-9.09	0.00	0.00	5	4	3	5	0.00	0.00	0.00	0.00
2008	6000	72	240	160	-3.23	-44.62	0.00	0.00	4	3	3	5	-20.00	-25.00	0.00	0.00
2009	6200	126	240	160	3.33	75.00	0.00	0.00	4	4	3	5	0.00	33.33	0.00	0.00
2010	6500	135	240	160	4.84	7.14	0.00	0.00	5	3	3	5	25.00	-25.00	0.00	0.00
2011	6300	135	240	160	-3.08	0.00	0.00	0.00	5	3	3	5	0.00	0.00	0.00	0.00
2012	6700	135	240	120	6.35	0.00	0.00	-25.00	5	3	3	3	0.00	0.00	0.00	-40.00
2013	6800	135	240	120	1.49	0.00	0.00	0.00	5	3	3	3	0.00	0.00	0.00	0.00
2014	7150	135	240	120	5.15	0.00	0.00	0.00	5	3	3	3	0.00	0.00	0.00	0.00
2015	7200	135	240	120	0.70	0.00	0.00	0.00	5	3	3	3	0.00	0.00	0.00	0.00
2016	7200	135	240	120	0.00	0.00	0.00	0.00	5	3	3	3	0.00	0.00	0.00	0.00
2017	7200	135	240	120	0.00	0.00	0.00	0.00	5	3	3	3	0.00	0.00	0.00	0.00

Source: USDA

Fig 2
Production (MT) - Wheat, Rice, Barley and Corn (1991-2017)

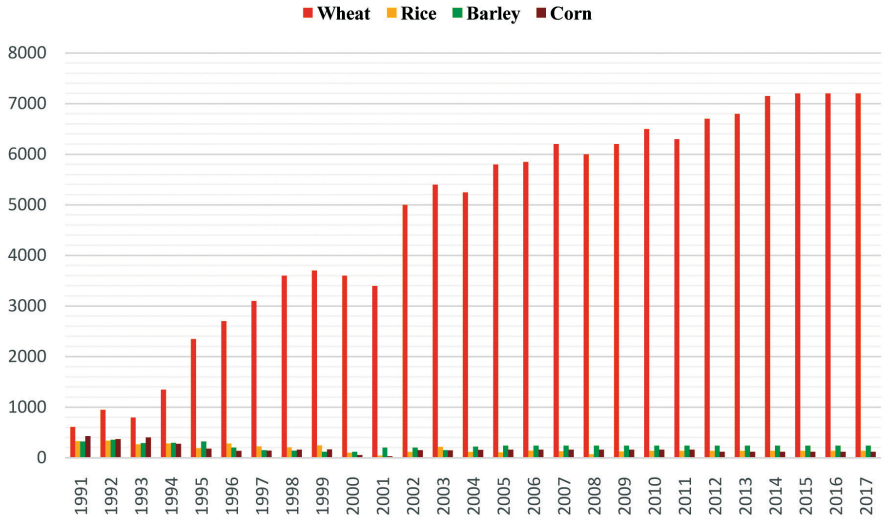

Figure drawn on the basis Table 4

Fig 3
Yield (MT/Hectare) -Wheat, Rice, Barley and Corn (1991-2017)

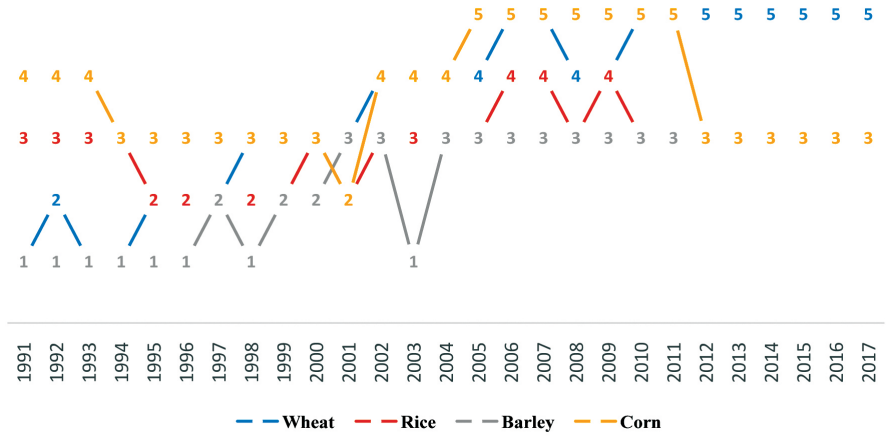

Figure drawn on the basis Table 4

Growth in Wheat production has recorded an upward trend. In the period of 1997 and 2001 the growth rate has not shown much fluctuations with the production varying between 3100 MT to 3400MT and yield 2-3 MT/Hectare. Rice production during the period 1991-1995has decreased from 327 to 191 MT, thereby registering a negative growth of 20.71% in 1993 and 32.03% in 1995. The yield in rice has shown

minor fluctuations between 1991-2000. Among other grains Corn has suffered a serious setback and has recorded a negative growth of 93% during 1991-2001. The production has declined from 431MT to 31 MT, and the yield has come down from 4MT/hectare to 2 MT/Hectare. The production of Barley has also declined between 1991-2000 and has recorded a negative growth of 62.96% but yield has remained constant to some extant in the said period.

In the period after 2001 onwards, Wheat has recorded highest growth. The production has increased from 3400 MT in 2001 to 7200MT in 2017 and the yield increased about 5 MT/Hectare. The main reasons for increased growth in Wheat production is that a large number of Cotton growing area have been reduced and diverted to Wheat, with the primary objective to achieve domestic demand for grain production in the country. However, the production of other grain crops especially Rice, Barley and Corn has almost remained stable with little fluctuations. The yield of these crops has also varied between 3 to 5 MT/Hectare. The production and productivity of other grain crops has not crossed the limits of Wheat production. However, Barley comparatively has gone high in production rate. Remaining crops include Rice, Corn, Maize, and other crops have maintained a steady growth with the exception that Corn is leading in yield. However cereal crops in totality have maintained stability in production, growth and productivity and have contributed a major share in the development of agricultural economy in the Republic of Uzbekistan. Out of total agricultural area grain crops occupy around 1.676 Million Hectares.

With vast differences in irrigational facilities, the agricultural attributes have shown diversity all over the Republic. The landforms, soil, climate etc. have played a wide role in effecting the land use and spatial distribution of crops. Relief and structure of land have exercised a direct influence on the land use, cropping pattern and spatial diversity in crop yield. The areas having assured rainfall and developed water supply differ from the areas where rainfall is more or less scanty. If such areas are irrigated properly and provided with better incentives, they can yield better results. Thus irrigation is the principle means for expanding the cultivated area, increasing and stabilizing the yield and diversifying agricultural production.

Suggestions and Conclusion

The grain crops mostly Wheat has bright growth prospects and the important reason being that domestic demand for food consumption

can be met. Cotton industry can employ a large workforce and can turn into an important industry. However, there are a number of problems in the agricultural sector which requires solutions. The regional imbalance in crop production, distribution and yield tend to reduce the efficiency of agricultural and hence reduce the economic benefits of the farmers. The country need to encourage the agriculture sector given its high economic prospects and employment opportunities. This will help to save livelihood of millions of people in the country who are directly or indirectly associated with this sector. The water related problems especially its scarcity, pollution and inadequate water management are the priority ecological solution in the nearest future. Sustainable management of water and agricultural biodiversity needed. Under ecological perspective it is suggested to integrate the underground irrigational system with modern approach.

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