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Full Length Research Paper

Changing cropping patterns: Food grains and non- food grains in Uzbekistan

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The new agricultural technology and conserving of state farms into individual and small house hold plots (sharkets and dekhans) has bought changes in the traditional cropping pattern in Uzbekistan, particularly in the two food crops — wheat and rice. During the period of 1991 to 1995 there were no changes in the cropping pattern. But from 1996 to 2001, the increase in area was marginal in the two food crops, but the increase in production was most significant. Gradually, the area increased at the cost of cotton crop. From 1981 to 1990 to 1991 to 2001, there was an increase of more than 10% in area. The low yield per hectare of food grains has been replaced by the high yielding varieties (HYV) of wheat and rice. In case of non food crops, during the last three decades, the area under cotton and tobacco varied between 0.71 and 0.61 thousand hectares since 1981.

Key words: Cropping pattern, food grains, non food grains, sharkets, dekhans.

INTRODUCTION

The study of cropping pattern constitutes a significant aspect within the spatial dimensions of agricultural geography as it provides a good base for regional planning (Ali, 1985). The studies made so far in the field range in approach and vary in extent from small areas of minor political units to the entire country (Shafi, 2006). Thus to draw a comprehensive picture of the broad mosaic of cropping pattern in Uzbekistan, study of character and extent of its crop association patterns seems importance. The delineation of crop regions thus determined would emphasize the regional framework of agricultural activities and specialization of crops to the area. The pattern of crop combination region that will emerge from the delineation might also serve the purpose in a balanced regional planning of Uzbekistan. The specific feature of Uzbekistan agriculture is that the country has vast area of agricultural land, but only 4.2 million hectares is arable and has been brought under irrigation (Boris and Stanislav, 1998). Only small area that can sustain rain fed production, cropland is only 9.1% of the total surface of Uzbekistan. At the out set of the transition the average irrigated land availability per capita is only 0.37 ha per rural inhabitant which substantiates population growth during the decade which declined to 0.28 ha per capita in the year 2001 (I.M.F., 1999). Therefore land pressure is high in general, but even more specifically in certain densely populated areas such as the Fergana valley.

MATERIALS AND METHODS

Agricultural development is a complex problem, therefore, reliable collection and sources of data are necessary for decision making and for future planning. For the present problem, data have been collected from various sources. Main sources of data collection include FAO production year books, agricultural abstract published by the United States and Uzbekistan. The published data about the agriculture of Uzbekistan have been collected from the different sources like World Bank Reports, statistical digest, Asia and pacific, IMF sources published by United States etc. Other sources of data collection include: Statistical abstracts published by the office of Prime Minster in Uzbekistan State Planning Agency. Development plan for economic and social development, published by Uzbekistan Republic's Government. Keeping in view the varied dimensions of the problem, the methodology used is also of different nature. The data pertaining to all sets and sub-sets have been formulated and tested by the test relevant and standardized techniques. Weavers and Doi's methods have been used. Similarly

for measuring crop productivity input to output, Kendal's method has been used:

$$= \frac{\text{(Yield/ hectare of the crop in that area}}{\text{(Yield/ hectare of the crop in the whole district}} X\ 100$$

In order to arrive at some generalizations for policy planning and management issues, a regional synthesis of the study area has been worked out.

RESULTS AND DISCUSSION

The introduction of new agricultural technology brought about changes in the traditional cropping patterns, particularly in wheat and rice (Karimov, 1995). The cropping pattern is influenced by physical factors like irrigation, improved varieties, and availability of fertilizers, land reform consolidation of holding, credit facilities, price structure, procurement policies and storage facilities. On the availability of alternative and more efficient crops than existing ones, new cropping patterns in a region may emerge. For intensifying the cropping pattern and multi cropping, the short duration fertilizers responsive, high yielding varieties are required (Lerman and Dennish, 1996). The cropping pattern of Uzbekistan is based mainly on the traditional system of farming in which farmers try to produce everything for his own subsistence that is why in Uzbekistan subsistence farming is more prevalent.

Area under food and non- food crops

One peculiar feature of cropping pattern in Uzbekistan is predominance of food crops over non food crops except cotton. Tables 1 and 2 shows that cotton have occupied the highest production of total cropped area in Uzbekistan. Among non food crops, cotton shares 76.32% of total cropped area in the country. The corresponding figures for other non food crops show 21.82% for fodder crop and 1.85% for other industrial crop. On the other hand, food crops (wheat) share in total cropped area is 68.93 and 13.37% by vegetables, 11.00% by rice, and 4.36% by maize and 2.32% by small grains (Chronicle, 2003). This suggests that non food crops have occupied the largest proportion of total cropped area 55.0% and food crop only 44.9% of the cropped area. Wheat is having a dominant share followed by vegetables and rice, while the remaining crops have a meager share except maize whose share have gone up to 4%. In case of non food crops cotton and fodder crops have relatively gone very high while the remaining crops have remarkably gone low.

Area under principal crops

A variety of crops that can be grown in central Asia is also grown in Uzbekistan. Wheat, rice, barley and maize are principal food grain crops, while cotton is the most important commercial crop grown in Uzbekistan (Allworth, 1973). It is observed from Table 3 that cotton and wheat are dominant crops and is grown in almost all the oblasts (states) of Uzbekistan. These crops together account for about 80.83% of total cropped area in the country. The proportion of cotton to total area is highest in Kashkadarya followed by Samarkand while it is least in Namagan. As against this, Kashkadarya topped to other regions in respect of percentage share of total cropped area under wheat. This shows that wheat is a predominant crop in Surkhandarya and Navoi oblasts, while cotton is a predominant crop in Republic. In Kashkadarya and Namagan states, cotton and wheat have occupied 21.52 and 19.9% of total cropped area, respectively. Next to these crops, barely and rice have occupied important place in Uzbekistan accounting for 7.50 and 5.25%, respectively. Inferior food grain crops like barely, maize, bajra etc have less importance in all these regions of Uzbekistan. The percent area under vegetables is low that is 1.36%. Similar pattern is observed in case of grapes is 2.70% and tobacco 0.26%, respectively.

Principal crop wheat has a dominant position followed by barely and rice, others are relatively on low profile. Cotton recorded a high share because it was used as a commercial crop even during Soviet times.

Future cropping pattern

Cropping pattern in Uzbekistan shows a close correlation to the rain fall pattern. The choice of crop depends on the amount and distribution of rainfall, but these are exceptions to this general principal, as there are areas with scanty rainfall, in which crops requiring large quantities of water to grow. In the present scenario of cropping pattern of Uzbekistan, such a situation should be discouraged. The pattern of cropping should be composed to agro-climatic conditions (Bhat, 1986). Owing to pressure of population, very often land has been used irrationally. Land use planning has to be done and implemented on a scientific basis. Also, the system of farming suitable for the land has to be given due weightage. It is necessary to restrict growing of crops only to favorable area which has good retentive soil and where water harvesting techniques may be feasible. The remaining area should be put under forage and economic tree crops. One significant change, which is highly desirable, is that cultivation of paddy should be stopped in area with low irrigation facilities and where the rainfall is just 300 mm per annum and the spread is restricted to only one or two low (Bukhara, Navoi and Khorezm) and

Table 1. Area under food crops in thousand hectares and their percent share (2005 to 2009).

S. no	Crop	Area 000 ha	% share
1	Wheat	1247	68.93
2	Vegetables	242	13.37
3	Rice	199	11.00
4	Maize	7.9	4.36
5	Small Grains	4.2	2.32
	Total	1809	100.00

Source: F.A.O production year book 2005-2009.

Table 2. Area under non-food crops in thousand hectares and their percent share (2005 to 2009).

S. no	Crops	Area 000 ha	% share
1	Cotton	1689	76.32
2	Fodder Crop	483	21.82
3	Other Industrial	41	1.85
	Total	2213	100.00

Source: F.A.O production year Book 2005-2009.

Table 3. Area under Principal Crops in Thousand hectares and their Percent Share (2005-2009).

S. no	Crop	Area 000 ha	% share
1	Cotton	1580.9	43.01
2	Wheat	1390.2	37.82
3	Rice	193.2	5.25
4	Barley	270.0	7.50
5	Maize	75.8	2.06
6	Vegetables	50.2	1.36
7	Grapes	99.3	2.70
8	Tobacco	9.9	0.26
	Total	3675.5	100.00

Source: FAOSTAT agricultural data computed on the basis of information available on FAO year book.

in certain instead. If maize is substituted for paddy, there would be increase in production by as much as two to three tones per hectares (Majeed, 1997).

It is pointed out by Majeed (1997) that changing cropping patterns might be difficult because the farmers are used to growing a particular crop for ages and food habits would not change. It is also argued that the existing cropping system have evolved after years of experience and have stood the test to time; but there are examples where farmers have changed the cropping pattern after seeing the benefits of the new pattern. For example, before independence vegetables and fruits were not important crops, but today Uzbekistan is one of the leading producers of vegetables and fruits in the central Asia. Similarly, rice, fruits, maize and vegetables were unknown in most of the oblasts, but when the farmers were educated about new crops, and facilities were provided for marketing, they brought about a change in the cropping pattern. The principle involved in changing the cropping pattern is based on availability of water, the quantum of rainfall, quality of soil, topography and temperature. Inspite of fairly good irrigation support, wheat yield in Djizak, Kashkadarya and karakalpakstan is low. The yield of maize in Bukhara and Karakalpakstan and that of paddy in Tashkent and Karakalpakstan are also low. The pattern should be substituted by maize after making proper drainage arrangement. The pattern of cropping in regions with low distribution of rainfall should be changed from paddy to millets, maize and cotton and vice versa. This will maintain the structure of the soil and pattern of cropping shall be according to the ecosystem (Allen, 1972).

Similarly, all irrigation resource in Andijan, Bukhara, Srydarya, Kashkadarya and Fergana are used mainly for growing paddy. The irrigation water should be used in changing the cropping pattern keeping the environment, the socio-economic and human nutrition in view. It may be of same advantage to divert some water for growing crops like pulses, jowar etc for animal consumption and also fodder and leguminous crops to build soil fertility.

Conclusion

The new agricultural technology has brought changes in the traditional cropping pattern, particularly in the two food crops - wheat and rice. From 1991 to 1995, there were almost no change in the cropping pattern, but from 1996 to 2000 the increase in area was marginal in these two food crops, but increase in production was most significant. Gradually, the area increased at the cost of cotton crop. From 1991 to 2009, there was an increase of about 6 to 9% in area. The influence of soil is dominant on cropping pattern but with the help of irrigation wheat is grown in the Rabi season and cotton, paddy is grown in Kharif season. However, there has not been any significant change in the cropping pattern of non food crops, both at state and national level. At the national level, the area under cotton has been progressively decreasing. In case of non food crops, during the last decade, there was almost no change in the area under maize and vegetables while area under grapes varied between 89.2 to 98.2 thousand hectares. The major goal of the agricultural land utilization as revealed by the composition and distributional pattern of crop combination region is the maximum production of cereal grains especially wheat for local consumption.

The crop combination region based on statistical technique is a significant device to assess dominating position of crops in different parts of the country.

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