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AGRICULTURAL STATISTICS OF AREA, PRODUCTION AND PRODUCTIVITY OF RICE OF DIFFERENT SECTORS OF U.P., INDIA

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Abstract

Uttar Pradesh is the most populous State in India with a population of over 199.5 million people, geographical area of 2,40,928 square km as of 1 March 2011. It is situated at 27°40'N Latitude & 80° 00' E Longitude. The production and productivity constraints of rice grown in different sectors of U.P. were estimated through yield gap analysis. Maximum yield gap (7.32 q/ha) of rice was observed in eastern U.P. followed by central U.P. (7.1 q/ha). This study will provide render help not only to the farmers for selection of crop, cropping pattern and change required in on going farming operations but also open an option window to select the crop/ variety to grow the *Kharif* crops in different sectors of U.P., India.

Key words : Agricultural statistics of area, production, and productivity.

Introduction

Rice occupies an area of about 155 million hectare at global level with production and productivity of 596 million tones. India rank first in acreage (48 million hectares) and second in production (131 million tonnes) after China. Rice is the staple food for three fourth of the Indian population alone contributes about 43 per cent of food grain and 46 per cent of cereal production in the country. In India rice is grown in almost all the states. Andhra Pradesh, Bihar, Uttar Pradesh, Madhya Pradesh & West Bengal lead in area. West Bengal & Uttar Pradesh have the highest rice production. The average yield per hectare is highest in Punjab (3346 kg/ha). Uttar Pradesh largest rice growing state in the country with an area of 954.0 Thousand hectare, production of 1358.0 Thousand tones and 1423 kg/ha^{-1} productivity.

In India, rice is grown under widely varying conditions. Rice cultivation in India extends from 8 to 35^0 N latitude and from sea level to as high as 3000 metres. The climatic factors that influence rice production are temperature, sun shine hours and humidity. Rainfall is a crucial agro-climatologically factor in the seasonally arid parts of the world and its analysis is an important perquisite for agricultural planning in India (Abrol and Gadgil, 1999). India is a tropical country its agricultural planning and utilization of water depends on monsoon rainfall. More than 75% of rainfall occur during the monsoon season. Monsoon rainfall is uneven both in time and space, so it is an important factor in evolve the rainfall analysis.

The average temperature required for *kharif* rice throughout the life period of crop ranges from 21 to 37^{0}C in India. During tillering stage high temperature, at the time of blooming temperature range of 26.5 to 29.5^{0}C become congenial for optimum yield. Average temperature requirement during ripening for is in the range of 20-25^{0}C. Rice (*Oryza sativa* L.) is the world leading staple food of more than 60 per cent of world population. It is the most important and extensively cultivated food crop in the world. Rice is the high calorie or high energy food. It contains 6 to 7 per cent protein. The biological value of its protein is very high. The fat content of rice is low (2.0 to 2.5 per cent). Rice contains low per centage of calcium. Rice grain contains as much B group vitamins. The by-products of rice are used for a variety of purposes. The bran of rice and straw are used as cattle and poultry feed. The rice hulls is used in manufacture of cardboard, cement and insulation materials.

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Materials and Methods

District wise historical data of rice area, production and yield for period of 1992-2011 of U.P. was obtained from State Agriculture Department of Lucknow. Time series graphs were plotted for trend analysis of area, production and productivity of rice for each sectors of U.P., India. The detailed data sheet of area, production and productivity of rice sectors of U.P. has been given in tables 1 to 4.

Table 1 : Area, production & productivity of rainfed rice in Eastern U.P. (1992-2011).

Year	Area (Thousand ha)	Production (Thousand mt)	Productivity (q/ha)
1992	168.47	268	15.8
1993	168.47	268	15.8
1994	167.84	298	18.1
1995	1651	253	15.6
1996	146.19	281	19.8
1997	137.27	258	18.8
1998	137.27	258	18.8
1999	148.57	308	20.7
2000	150.09	283	19.1
2001	152.41	309	20.6
2002	138.26	239	17.8
2003	143.92	306	21.8
2004	140.90	241	18.2
2005	141.32	268	19.0
2006	145.25	254	17.7
2007	148.81	284	18.9
2008	150.81	319	21.3
2009	135.28	263	19.5
2010	141.69	298	21.1
2011	1487	331	22.9
Total	2974.00	5589	381.3
Average	**149.00**	**280**	**19**

Results and Discussion

Current time series (1992-2011) data of area, production and productivity of rice grown in different sectors of U.P. has been depicted in tables 1 to 4 and figs. 1. to 12. From the table, it has been observed that the average area of rice in Bundelkhand region of U.P. was minimum 12.14 thousand hectare due to lack of irrigation, undulated topography and least rainfall followed by Western U.P. 65.00 thousand hectares. Eastern U.P. possess highest area 149.00 thousand hectare of rice cultivation followed by Central U.P. 112.00 thousand hectare. From the graph it is also obvious that the area of rice coverage in Eastern U.P. (-1.12) was decreasing

Table 2 : Area, production & productivity of rainfed rice in Western U.P. (1992-2011).

Year	Area (Thousand ha)	Production (Thousand mt)	Productivity (q/ha)
1992	55.53	117	21.1
1993	55.53	117	21.1
1994	60.54	127	20.9
1995	59.62	134	21.3
1996	59.06	141	21.1
1997	59.94	145	24
1998	59.94	145	24
1999	70.92	152	21.2
2000	72.24	150	20.5
2001	70.52	154	21.5
2002	55.65	147	20.6
2003	61.26	137	22.2
2004	70.83	155	24.0
2005	69.48	141	22.7
2006	65.09	132	22.7
2007	62.90	136	24
2008	71.59	148	23.0
2009	72.23	151	23.2
2010	72.17	135	21.0
2011	713	176	24
Total	1300.00	2838	449
Average	**65.00**	**140**	**22.2**

Table 3 : Area, production & productivity of rainfed rice in Central U.P. (1992-2011).

Year	Area (Thousand ha)	Production (Thousand mt)	Productivity (q/ha)
1992	110.29	214	19.0
1993	110.29	214	19.0
1994	115.55	210	17.6
1995	1131	241	20.3
1996	111.40	252	21.6
1997	1059	253	23
1998	1059	253	23
1999	1113	265	22.9
2000	1177	233	18.9
2001	120.38	265	21.1
2002	108.89	212	19.7
2003	108.39	237	21.7
2004	117.39	245	21.6
2005	112.66	234	21.3
2006	115.25	234	20.6
2007	114.04	241	21.0
2008	115.05	238	21.8
2009	110.82	246	22.6
2010	1122	241	21.7
2011	112.96	275	24
Total	2248.36	4800	424.0
Average	**112.00**	**240**	**21.20**

Table 4 : Area, production & productivity of rainfed rice in Bundelkhand Region of U.P. (1992-2011).

Year	Area (Thousand ha)	Production (Thousand mt)	Productivity (q/ha)
1992	184	15	8.4
1993	184	15	8.4
1994	138	14	8.1
1995	154	10	7.1
1996	147	17	11.3
1997	12.13	13	8.8
1998	12.13	13	8.8
1999	12.99	16	9.9
2000	130	14	9.9
2001	110	17	10.3
2002	11.08	8	6.1
2003	11.86	13	11.0
2004	12.63	14	8.6
2005	9.17	8	10.3
2006	10.20	9	8.8
2007	10.27	6	5.7
2008	11.38	16	13.0
2009	8.78	10	10.8
2010	9.66	12	12
2011	11.54	18	15.2
Total	243.00	262	194
Average	**12.14**	**13**	**10**

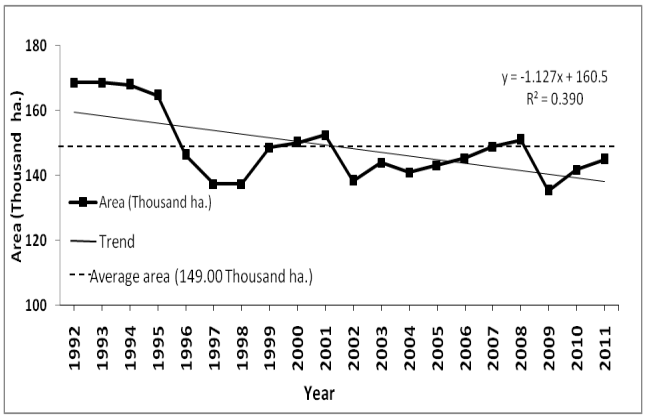

Fig .1 : Area (Thousand ha.) of rice in Eastern U.P, India.

where as in Western (0.80) and Central U.P. the area of rice were increasing trends may be because of low decreasing rate of South-West monsoon in Northern U.P.

Time series (1992-2011) data analysis of production of rice crop in different sectors of U.P. has been shown in tables 1 to 4. From the table, it has been observed that the average production of rice in Bundelkhand region of U.P. is minimum 13 thousand mt may be due to low productivity & low rice coverage followed by Western U.P. 140.00 thousand mt.

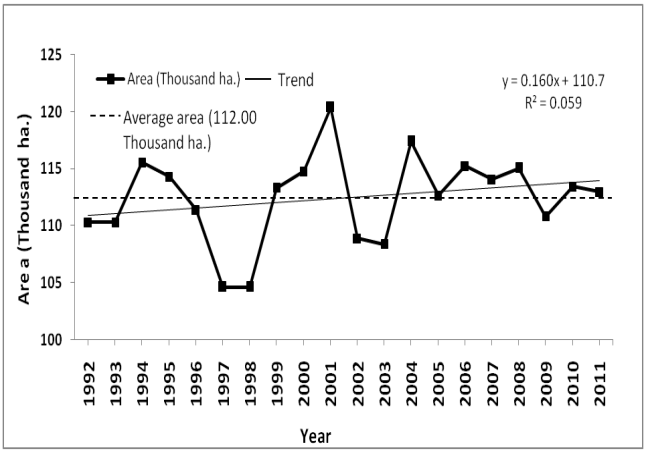

Fig. 2 : Area (Thousand ha.) of rice in Central U.P, India.

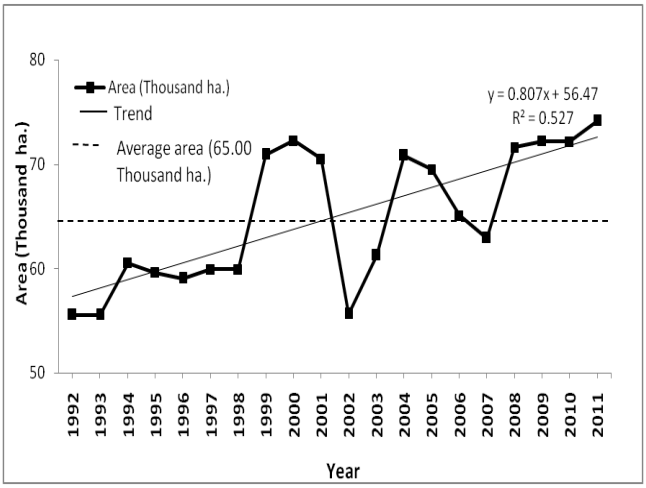

Fig. 3 : Area (Thousand ha.) of rice in Western U.P, India.

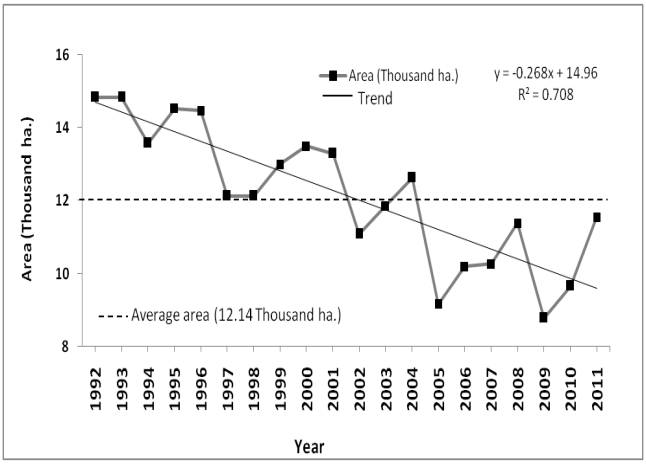

Fig. 4 : Area (Thousand ha.) of rice in Bundelkhand region.

Time series variation of rainfed rice productivity (q/ha) in different sectors of U.P. has been depicted in Fig. 9 to 12. From the graph, it has been observed that productivity increased in recent year after 2000- 2001 in all sectors of U.P. From the graph it is seen that rate of increase of productivity of rice in Eastern U.P.& Western

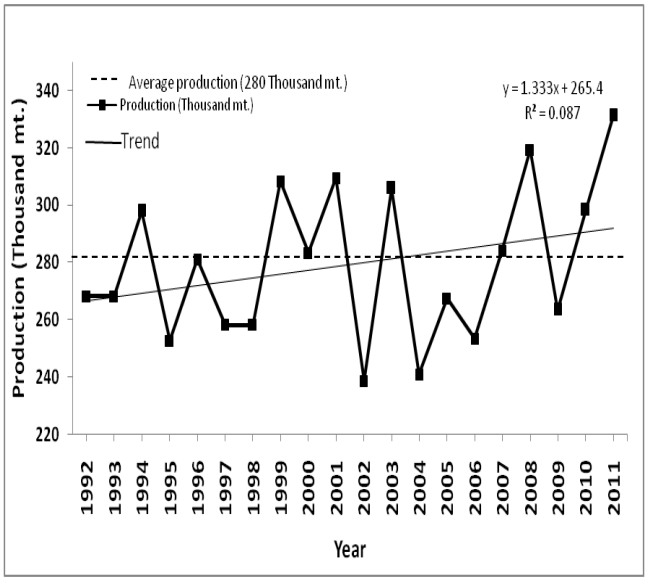

Fig. 5: Production (Thousand mt.) of rice in Eastern U.P, India.

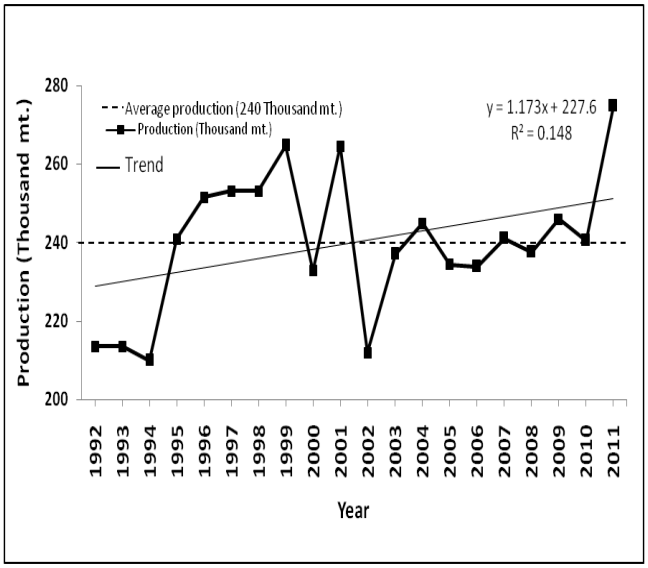

Fig. 6: Production (Thousand mt.) of rice in Central U.P, India.

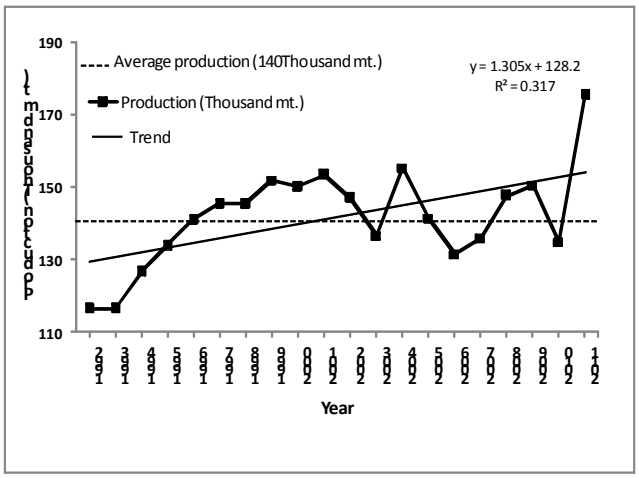

Fig. 7: Production (Thousand mt.) of rice in Western U.P., India.

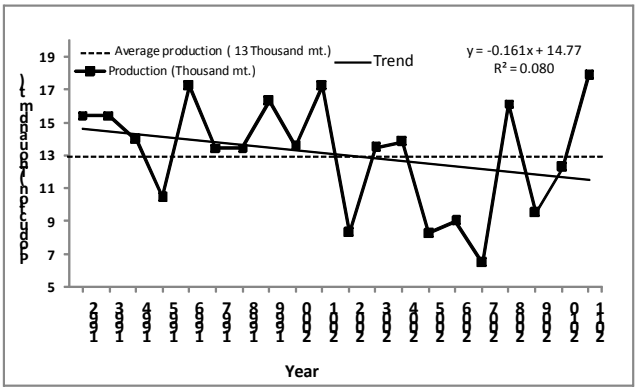

Fig. 8 : Production (Thousand mt.) of rice in Bundelkhand region.

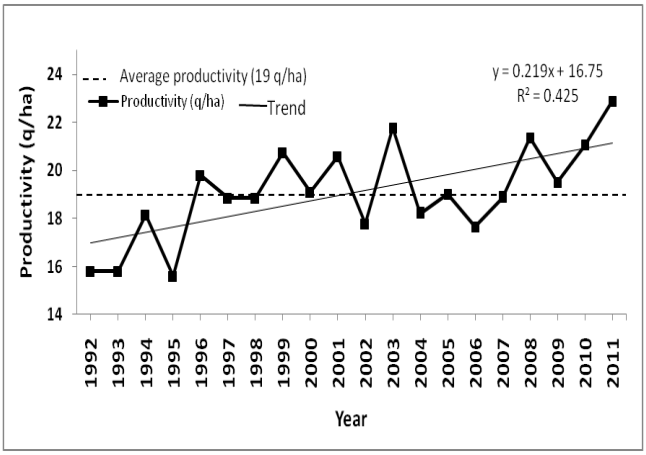

Fig. 9 : Productivity (q/ha) of rice in Eastern U.P., India.

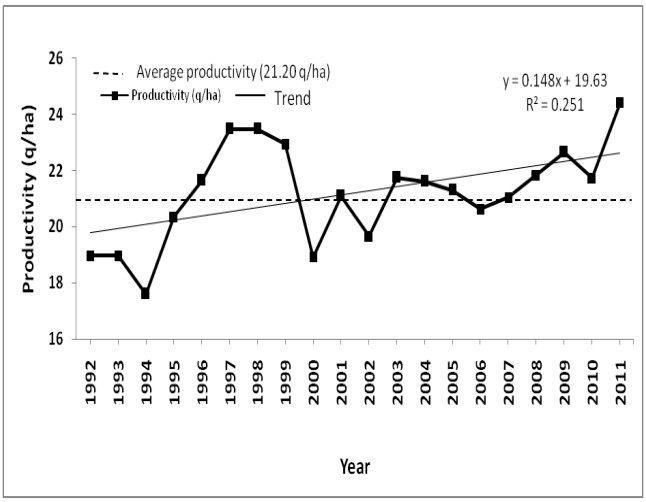

Fig. 10 : Productivity (q/ha) of rice in Central U.P., India.

U.P are at par and highest as compare to Central & bundelkhand region. Higher productivity may be because more rainfall availability during crop period, where as in Western U.P. due to better management of rainfall & water use efficiency during crop period. The yearly variation of productivity of different sectors has been shown in figs. 9 to 12.

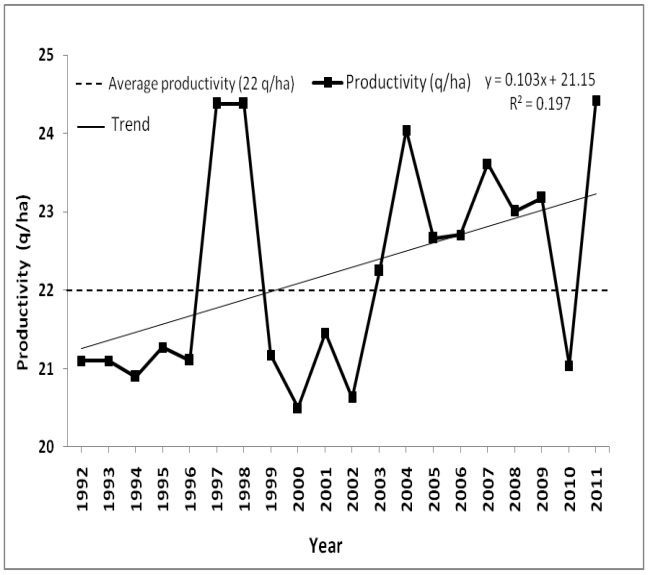

Fig. 11 : Productivity (q/ha) of rice in Western U.P., India.

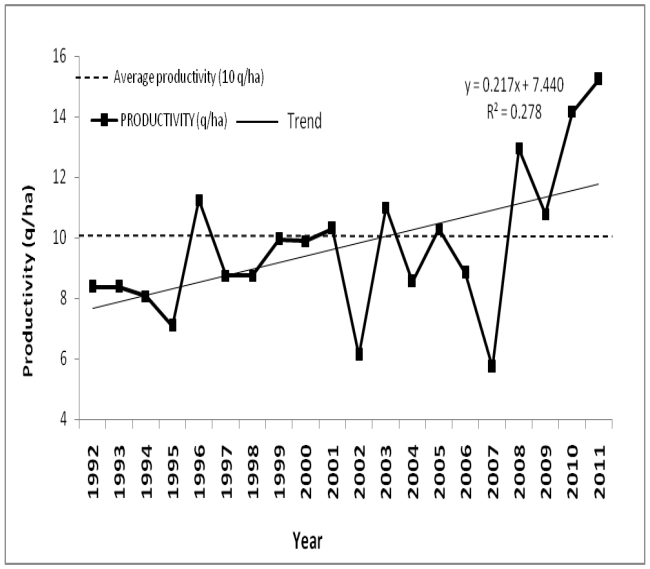

Fig. 12 : Productivity (q/ha) of Rice in Bundelkhand region.

Conclusion

Eastern U.P. possess highest area 149 thousand hectare of rice cultivation followed by Central U.P. 112 thousand hectare & Western U.P. (65 thousand hectare. In Bundelkhand region of U.P. area of rice was minimum only 12.14 thousand hectare. The area of rice coverage in Eastern U.P. was decreasing where as in Western and Central U.P. the area of rice was increasing. Productivity of rice increase from 2000-2001 onward in all sectors of U.P. but rate of increase of productivity of rice in Eastern U.P.& Western U.P are at par and highest as compare to Central & Bundelkhand region. Maximum yield gap was found in eastern U.P. 7.3 q/ha at 865 mm rainfall followed by central U.P. 7.1 q/ha at 780 mm rainfall and 5.9 q/ha in Bundelkhand region of U.P. at 610 mm rainfall. In western U.P. the yield gap was lowest only 3.9 q/ha at 710 mm rainfall. Maximum yield gap was observed in eastern U.P. and minimum in western U.P. at low rainfall 710 mm. Out of four sectors lowest yield was recorded in Eastern U.P. (23 q/ha) at more water availability of 865 mm as compared to central U.P. 780 mm for 24 q/ha productivity. In western U.P. at lower water availability 710 mm highest yield was 25q/ha obtained as compared to other sectors of U.P.

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