



DIVERSIFICATION OF AGRICULTURE IN UTTAR PRADESH

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ABSTRACT

Agriculture is a mode of living in India. A large segment of India's population still depends on agriculture and allied activities for their sustenance. India is a leading country in production of a few agriculture commodities. There is a considerable scope for raising farm income and employment through increasing agro-based exports without letting down the food security issues. Uttar Pradesh is characterized by abundant natural resources such as diverse agro-climatic conditions, varied soil type and abundance of rainfall which has immense scope for growing large varieties of crops. The agriculture in the state is highly diversified due to comparative advantage of wide range of agro-climatic variability, the state produces many crops. Against this backdrop, present paper highlights the trends and patterns in agriculture development in the context of crop diversification in Uttar Pradesh. The paper is based on time series data analysis on the statistics available from Directorate of Agriculture , Government of Uttar Pradesh.

Introduction

Uttar Pradesh is characterized by abundant natural resources such as diverse agro-climatic conditions, varied soil type and abundance of rainfall which has immense scope for growing the varieties of horticulture crops (Basu, 2008). Despite being of this, degree of agricultural

diversification is much less in Uttar Pradesh. Thus under this situation, this calls for the change in cropping pattern from low value subsistence farming to high value i.e. multi-cropping pattern.

Review of literature

Various studies (Chand and Chauhan, 1999; Joshi *et al.*, 2004) also suggested that the agriculture diversification may be a means for rapid development in the country in order to solve all the economic ills. However, in Uttar Pradesh, majority of the farmers are small and marginal, cultivating mainly low value subsistence crops. Previous study also demonstrated that the production of high valued commodities require capital, technology and information intensively. Small and marginal farmers lack resources. Further, lack of access to markets is also constraint to diversification towards high valued horticultural crop. Small farmers have less marketable surplus while local rural markets are limited and they are forced to sell surplus agricultural produce in distant urban markets which is costlier (Birtal, *et al.*, 2005).. The study has attempted to identify the important factors that affect agricultural growth in Uttar Pradesh.

Uttar Pradesh has shown stagnation in the increment of its Net sown area and gross cropped area during the period of 1991-92 to 2009-10. The net sown area has increased only slightly from 16430 thousand hectare in 1991-92 to 16589 thousand hectares in 2009-10. Similarly the gross cropped area has increased marginally from 24015 thousand hectare to 25440 thousand hectare in the same period. In fact the NSA and GCA in the state have witnessed the negative compound annual growth rate of 0.3 per cent and 0.1 per cent per annum respectively during this period. This is because of continuous rise in population which led to increase the encroachment of agricultural land for the non- agricultural purposes like rural habitations, forestation, urbanization and industrialization etc. and secondly due to rapid increase in the number of small and marginal operation holdings which leads to adverse impact on land-man ratio. Other reasons for negative growth rate of net sown area may be increase in the fragmentation of land holdings due to equal distribution to heirs as well as due to family subdivision and continuous increase in the fallow land and it makes them non-feasible and undividable for technological use. It may be suggested that area under crops should grow either through increasing in net area sown or through increasing intensity of cultivation. With regard to the possibility of increasing net sown area on a substantial scale, the possible method of

increasing gross cropped area is through increasing intensity of cultivation through irrigation and introducing short duration crops (Bhalla and Singh, 2009).

Methodology

In this paper data has been collected from the agricultural directorate of the state and time series data analysis has been done to analyse the present agricultural position and pattern of the state.

Analysis and computation of data

During 2013-14, out of gross cropped area, 63.6 per cent area was reported under total good grains crops while area under total cereals was recorded 50.9 per cent. Area under rice was reported 22.4 per cent while area under wheat was recorded 15.6 per cent. There has been decline in the area under rice, coarse cereals and total food grains while there has been significant increase in the area under total pulses, sugarcane, condiment and spices, total fruits, vegetables, total oilseeds and total fibres crops during the period of 2001-02 to 2013-14 (Table 1).

Table: 1

Distribution Of Gross Cropped Area Across Major Crops

Year	2001-02	2013-14
Rice	24.0	22.4
Wheat	14.2	15.6
Coarse Cereals	15.9	13.1
Total Cereals	54.0	50.9
Total Pulses	11.3	12.5
Total Food Grains	65.3	63.6
Sugarcane	2.3	2.6
Condiment and Spices	1.3	1.6

Total Fruits	2.1	3.6
Total Vegetables	3.3	4.7
Total Oilseeds	12.4	13.9
Total Fibres	5.2	6.6
Tobacco	0.2	0.2
Other Crops	7.8	4.2
GCA	100	100

Source: Computed from Agricultural Statistics.

Agriculture in Uttar Pradesh is highly diversified. It produces Due to comparative advantage of wide range of agro-climatic variability, the state has various crops. The state is one of the major food grain producing states in the country. Paddy and wheat are the most important crops of the state. Maximum area is being used for cultivation of food grains of which only 13.8 percent is covered under pulses. About 79.8 per cent of the gross cropped area has been devoted for the production of food grains. Sugarcane, potato, mustard, groundnut, gram, pea and lentil are other important crops grown in the state. The sunflower and soybeans are also widely grown in the state. The cropping patterns in various agro climatic zones in the state differ in terms of commodities and seasonal crops. With the development of appropriate technology, suitable for various agro-climatic conditions and the new varieties, there is a slight deviation in cropping pattern has been noticed in the state. The area under coarse cereals has gradually decreased in order to give space to other high valued crops. There has been reduction in the area under pulses crops..

Area under food grain crops was reported about 20 to 21 m ha between 1980 and 2000. It constituted 83 per cent of the total cultivated area in the state in the 1999- 2000. It was higher than national average of area under food grain crops, which constituted 66 per cent in the corresponding period. About one-fifth of country's food grain production came from Uttar Pradesh during 1999-2000. Rice and wheat are the principal food grain crops. Their relative share in the gross cropped area was about 23 per cent and 35 per cent respectively in the 1999-2000. The state is the largest wheat producing state in the country. About one third of total wheat produced in the country was contributed by the state during 1999-2000. The state ranked second

in rice production, next to West Bengal. The area under wheat has increased by 0.95 m ha and of rice by 0.53 m ha between 1980 and 2000. Rice has replaced sorghum, pearl millet and maize, while wheat substituted barley and to some extent chickpea. Area under all coarse cereals has declined by 0.3 m ha during the same period. Their relative share in gross cropped area has marginally come down from 16 per cent in 1982-83 to 15 per cent in 1999-2000 (Table 2).

Table: 2
Cropping Pattern of Uttar Pradesh

<i>Crop</i>	<i>Area ('000 ha)</i>			<i>Share in GCA (%)</i>		
	<i>1982-83</i>	<i>1991-92</i>	<i>1999-2000</i>	<i>1982-83</i>	<i>1991-92</i>	<i>1999-2000</i>
Rice	5266.02	5587.81	5791.45	21.33	21.92	22.5
Wheat	8046.46	8783.13	8991.46	32.6	34.45	34.93
Sorghum	614.15	509.25	372.58	2.49	2	1.45
Pearl Millet	977.09	807.71	839.21	3.96	3.17	3.26
Maize	1203.02	1128.92	1141.76	4.87	4.43	4.44
Other Coarse Cereals	1253.67	729.75	1408.93	5.08	2.86	5.47
All Cereals	17360.41	17546.57	18545.39	70.33	68.82	72.04
Chickpea	1498.24	1160.11	813.79	6.07	4.55	3.16
Pigeon Pea	505.22	485.09	428.24	2.05	1.9	1.66
Other Pulses	879.25	1108.92	1561.97	3.56	4.35	6.07
All Pulses	2882.71	2754.12	2804	11.68	10.8	10.89
All Food	20243.12	20300.69	21349.39	82.01	79.62	82.93

grains						
Groundnut	257.66	146.46	110.15	1.04	0.57	0.43
Sesamum	45.53	67.08	94.22	0.18	0.26	0.37
Rapeseed and Mustard	425.34	673.59	692.15	1.72	2.64	2.69
Linseed	72.66	73.65	135.66	0.29	0.29	0.53
Sunflower	4.9	9.53	72.16	0.02	0.04	0.28
Other Oilseeds	55.25	76.64	105.25	0.22	0.3	0.41
All Oilseeds	861.34	1046.95	1209.59	3.49	4.11	4.7
Sugarcane	1679	1882.04	1888.03	6.8	7.38	7.33
Potato	271	326.82	440.28	1.1	1.28	1.71
Onion	20.11	29.26	48.09	0.08	0.11	0.19
All Vegetables	466	577.06	627.09	1.89	2.26	2.44
Misc. Crops	1160.49	1351.28	137.62	4.7	5.3	0.53

Source: Computed from Agriculture Statistics.

Changing cropping pattern in Uttar Pradesh is shown in Table 3. Area under rice cultivation as against total gross cropped area was recorded as high as 23.85 per cent during 2001-02 while it was recorded as low as 1.92 per cent in 1970-71. Area under wheat crop was reported 38.26 per cent in 2010-11 while it was recorded 16.61 per cent in 1950-51. Area under total pulses has drastically reduced in the state. It was recorded as high as 21.76 per cent as against gross cropped area while it was reduced to 9.11 per cent in 2013-14. Area under total food grains has also reduced 77.67 per cent in 2013-14 from 85.61 per cent in 1950-51. Area under sugarcane crops was recorded 8.58 per cent in 2013-14. However, it was

recorded high in 2007-08. Area under total oilseeds has increased to 4.44 per cent in 2013-14 from 1.74 per cent in 1950-51. Area under potato crop has also significantly increased from 0.38 per cent in 1950-51 to 2.1 per cent in 2013-14. Thus, there has been shifting of crops from cereal and food grains crops to commercial and high valued crops over the period.

Table: 3
Changing Cropping Pattern in Uttar Pradesh
(Percentage against GCA)

Year	Rice	Wheat	Total Pulses	Total Food Grains	Sugarcane	Total Oilseeds	Potato
1950-51	19.29	16.61	21.76	85.61	5.08	1.74	0.38
1960-61	18.89	17.78	20.53	82.82	6	2.06	0.45
1970-71	1.92	16.83	16.05	83.84	5.79	3	0.65
1980-81	21.53	33.01	11.63	83.29	5.54	2.88	1.04
1990-91	23.12	35.27	12.51	78.83	7.64	4.19	1.32
1995-96	21.55	34.59	10.97	78.83	7.73	4.67	1.39
2000-01	23.34	36.51	10.63	80.25	7.65	3.4	1.55
2001-02	23.85	36.37	10.54	80.15	7.99	3.27	1.52
2002-03	21.44	37.69	10.87	78.83	8.83	3.17	1.81
2003-04	22.52	37.14	11	79.8	8.29	3.02	1.73
2004-05	23.3	36.72	11.03	79.74	7.84	3.53	1.7
2005-06	23.25	36.51	10.43	79.05	8.18	3.71	1.77
2006-07	22.96	36.94	9.71	78.24	8.61	3.85	1.88
2007-08	22.82	37.12	8.96	77.69	8.88	3.98	2.04
2008-09	23.52	37.96	9.1	78.73	8.3	3.69	2.03
2009-10	22.11	38.25	10.02	78.52	7.9	4.38	2.03
2010-11	22.69	38.26	9.55	78.68	8.03	4.16	2.06
2011-12	22.94	38.06	9.39	78.29	8.22	4.12	2.09

2012-13	22.93	37.89	9.28	77.93	8.36	4.24	2.08
2013-14	23.11	37.71	9.11	77.67	8.58	4.44	2.1

Source: Computed from Agriculture Statistics.

Area under cereals crops in Uttar Pradesh is shown in Table 4. During 1980-81 to 1990-91, there has been negative growth in area under cereals crops in all the geographical regions except in Central region however, there has been significant growth in area under cereal crops during 1990-91 to 2015-16 in all the geographical regions except in Bundelkhand region.

Table: 4

Area under Cereals Crops in Uttar Pradesh

Region	1980-81	1990-91	2000-01	2015-16	1980-81 To 1990-91	1990-91 To 2015-16
Eastern Region	8079759	7486641	7655600	7806686	-7.34	4.27
Western Region	5421747	4996656	5755172	5696573	-7.84	14.01
Central Region	1958523	2878914	3206210	3100101	46.99	7.68
Bundelkhand Region	1165088	1010261	998910	869479	-13.29	-13.94
Uttar Pradesh	16625117	16372472	17615892	17472839	-1.52	6.72

Source: Computed from Agriculture Statistics.

Total cereal productivity in Uttar Pradesh is shown in Table 5. The productivity of cereal crops has been recorded high during post-reform period as compared to pre-reform period in all the geographical regions in the state. Moreover, a higher productivity rate was recorded in 2015-16 as compared to productivity rate of 2000-01.

Table: 5**Cereals Productivity in Uttar Pradesh****(MT/ Hectare)**

Region	Cereals Productivity			
	1980-81	1990-91	2000-01	2015-16
Eastern Region	1.14	1.72	2.12	2.21
Western Region	1.57	2.27	2.71	2.90
Central Region	1.18	1.94	2.22	2.49
Bundelkhand Region	0.88	1.30	1.64	1.56
Uttar Pradesh	1.27	1.90	2.30	2.45

Source: Computed from Agriculture Statistics.

Area, production and yield of food grains in Uttar Pradesh is shown in Table 6. Area under food grains crops constituted 77.67 per cent as against gross cropped area in 2013-14. There has been decline in the area under food grains crops as percentage of gross cropped area over the period of 1950-51 to 2013-14. Average yield of food grains crops has shown an increasing trend over the period. It was recorded highest in 2012-13 and lowest in 1950-51. A higher productivity rate was recorded during post-reform period as compared to pre-reform period.

Table: 6

**Area, Production and Yield of Food Grains in
Uttar Pradesh**

Area in Hectare**Production in MT****Yield- MT /Hectare**

Year	Area	Percentage Against Gross Cropped Area	Production	Average Yield
1950-51	17089000	85.61	11775000	6.89
1960-61	18343000	82.82	14486000	7.9
1970-71	19458000	83.84	19467000	10
1980-81	20469000	83.29	24948000	12.19

1990-91	19373008	78.84	35516000	17.39
1995-96	20333000	78.83	38354000	18.86
2000-01	20308000	80.25	42751000	23.04
2001-02	20398054	80.15	44135539	21.64
2002-03	19165500	78.83	38279042	19.97
2003-04	20290430	79.8	44463901	21.91
2004-05	20355365	79.74	39996806	19.65
2005-06	20007297	79.05	41086387	20.54
2006-07	19886177	78.24	41865452	21.05
2007-08	19671644	77.69	43031972	21.88
2008-09	20053962	78.73	47381957	23.63
2009-10	19975778	78.52	44664487	22.36
2010-11	20155536	78.68	48192451	23.91
2011-12	20144298	78.29	52057080	25.84
2012-13	20124362	77.93	52275814	25.98
2013-14	20115028	77.67	50502072	25.11

Source: Computed from Agriculture Statistics.

Total food grains area in Uttar Pradesh is shown in Table 7. There has been significant growth in area under food grains crops in Western region during 1990-91 to 2015-16. However, area under food grains crops during pre-reform period has shown negative growth in all the geographical regions except in Bundelkhand.

Table: 7

Food Grains Area In Uttar Pradesh

(Area in Hectare)

Region	Total Food grains Area				Growth Rate	
	1980-81	1990-91	2000-01	2015-16	1980-81 To 1990-91	1990-91 To 2015-16
Eastern Region	9249925	8483686	8538213	8400752	-8.28	-0.98
Western Region	6009742	5491038	6004530	5894182	-8.63	7.34
Central Region	15259667	3380080	3577586	3371735	-77.85	-0.25
Bundelkhand	1938384	2018204	2187241	1687010	4.12	-16.41

Region						
Uttar Pradesh	19455304	19373008	20307570	19353679	-0.42	-0.10

Source: Computed from Agriculture Statistics.

Total food grains production in Uttar Pradesh is shown in Table 8. Though, production of food grains crops has shown an increasing trend however, a higher growth rate of food grains production was recorded in Western region during post-reform period as compared to pre-reform period. However, higher growth rate in production of food grains was recorded in pre-reform period as compared to post-reform period in all the geographical regions except in Western region.

Table: 8

Food grains Production in Uttar Pradesh

(Production in MT)

Region	Total Food grains Production				Growth Rate	
	1980-81	1990-91	2000-01	2015-16	1980-81 To 1990-91	1990-91 To 2015-16
Eastern Region	10426106	13809313	17047745	17720798	32.45	28.32
Western Region	9011199	11778990	15822526	16634542	30.72	41.22
Central Region	2581937	6070309	7480099	7875711	135.11	29.74
Bundelkhand Region	1602208	2209370	2385533	1716705	37.90	-22.30
Uttar Pradesh	23621450	33867982	42735903	43947756	43.38	29.76

Source: Computed from Agriculture Statistics.

Total food grains productivity in Uttar Pradesh is shown in Table 9. Productivity of food grains crops has been recorded significantly high in post-reform period as compared to pre-reform period. Moreover, a higher rate of productivity of food grains

crops was recorded in 2015-16 as compared to 2000-01 in all the geographical regions of the state.

Table: 9

Food Grains Productivity in Uttar Pradesh

(MT / Hectare)

Region	Food grains Productivity			
	1980-81	1990-91	2000-01	2015-16
Eastern Region	1.13	1.63	2.00	2.11
Western Region	1.50	2.15	2.64	2.82
Central Region	0.17	1.80	2.09	2.34
Bundelkhand Region	0.83	1.09	1.09	1.02
Uttar Pradesh	1.21	1.75	2.10	2.27

Source: Computed from Agriculture Statistics.

Area, production and yield of total pulses in Uttar Pradesh is shown in Table 10. There has been decline in area, production and productivity of total pulses in the state during the period of 1950-51 to 2013-14. Area under total pulses was recorded 21.76 per cent as against of gross cropped area in 1950-51 which decline to 9.11 per cent in 2013-14. Thus, area under total pulses has reduced mainly in post-reform period in the state. Average yield of total pulses has also reduced to 6.36 MT/hectare in 2013-14 from 27.68 MT/hectare in 1950-51

Table: 10
Area, Production and Yield of Pulses in
Uttar Pradesh

Area in Hectare
Production in MT
Yield- MT /Hectare

Year	Area	Percentage Against Gross Cropped Area	Production	Average Yield
1950-51	4345168	21.76	3023440	27.68
1960-61	4547667	20.53	3823906	22.82
1970-71	3724829	16.05	3069258	24.42
1980-81	2859305	11.63	2526430	23.09
1990-91	3039986	12.51	2771809	18.42
1995-96	2830279	10.97	2188331	18.99
2000-01	2691678	10.63	2160356	13.53
2001-02	2683412	10.54	2376428	8.86
2002-03	2643103	10.87	2182298	8.26
2003-04	2797304	11	2447480	8.75
2004-05	2817035	11.03	2430343	8.63
2005-06	2640389	10.43	2205398	8.35
2006-07	2468618	9.71	1813867	7.35
2007-08	2270011	8.96	1626678	7.17
2008-09	2320323	9.1	2084836	8.99
2009-10	2550161	10.02	1905987	7.47
2010-11	2448127	9.55	2016513	8.24
2011-12	2416059	9.39	2397305	9.92
2012-13	2396508	9.28	2388862	9.97
2013-14	2361205	9.11	1501864	6.36

Source: Computed from Agriculture Statistics.

Area under Area, production and yield of oilseeds in Uttar Pradesh are shown in Table 11. There has been significant increase in area under oilseeds crops in the state. During 2013-14,

area under oilseeds crops as against gross cropped area was recorded 4.44 per cent while it was 1.74 per cent in 1950-51. There has been increasing trend in the production of oilseeds crops in the state. The production has shown a higher rate of growth in post-reform period as compared to pre-reform period. Similarly, a higher rate of productivity was recorded in post-reform period as compared to productivity of oilseeds crops in pre-reform period.

Table: 11
Area, Production and Yield of Oilseeds in
Uttar Pradesh

Area in Hectare
Production in MT
Yield- MT /Hectare

Year	Area	Percentage Against Gross Cropped Area	Production	Average Yield
1950-51	348147	1.74	182421	5.24
1960-61	458359	2.06	258891	5.65
1970-71	697347	3	380338	5.45
1980-81	708724	2.88	373672	5.27
1990-91	1019615	4.19	849304	8.35
1995-96	1205924	4.67	1047090	8.68
2000-01	860585	3.4	710258	8.25
2001-02	834221	3.27	725192	8.69
2002-03	771437	3.17	595664	7.72
2003-04	769641	3.02	646114	8.4
2004-05	902307	3.53	762652	8.45
2005-06	940551	3.71	878258	9.34
2006-07	978526	3.85	753805	7.7
2007-08	1009357	3.98	761365	7.54
2008-09	942035	3.69	835675	8.87

2009-10	1114998	4.38	807627	7.24
2010-11	1067736	4.16	892730	8.36
2011-12	1062569	4.12	889385	8.37
2012-13	1096301	4.24	1004998	9.17
2013-14	1151596	4.44	843290	7.32

Source: Computed from Agriculture Statistics.

Area, production and yield of sugarcane in Uttar Pradesh are shown in Table 12. Maharashtra, Uttar Pradesh, Karnataka, Tamil Nadu and Andhra Pradesh are major states in sugarcane production in India. Area under sugarcane in the state of Uttar Pradesh constitutes about 8.58 per cent of gross cropped area. There has been increase in the percentage of area under sugarcane against gross cropped area in the state over the period of 1950-51 to 2013-14. The area under sugarcane crop has increased with the development of rural infrastructure such as roads, transportation and increasing capacity of sugarcane mills. There has been increasing trend in the production of sugarcane in the state over the period. Sugarcane productivity has also increased significantly over the period.

Table: 12

**Area, Production and Yield of Sugarcane in
Uttar Pradesh**

Area in Hectare

Production in MT

Yield- MT /Hectare

Year	Area	Percentage Against Gross Cropped Area	Production	Average Yield
1950-51	1014000	5.08	29498000	291.04
1960-61	1329000	6	54516000	410.21
1970-71	1345000	5.79	54672000	406.42
1980-81	1363000	5.54	64205000	470.9
1990-91	1858000	7.64	103562000	558.1

1995-96	1994000	7.73	12102000	606.91
2000-01	1938000	7.65	106068000	549.19
2001-02	2034883	7.99	117981573	579.8
2002-03	2148981	8.83	120948041	562.82
2003-04	2110126	8.29	117566725	557.15
2004-05	2002320	7.84	121755620	608.07
2005-06	2070582	8.18	120960643	584.19
2006-07	2188650	8.61	130992193	598.51
2007-08	2249741	8.88	128736390	572.23
2008-09	2116256	8.3	111033594	524.67
2009-10	2011028	7.9	118957721	591.53
2010-11	2058703	8.03	116877568	567.72
2011-12	2116998	8.22	126110299	595.7
2012-13	2158814	8.36	134846100	624.63
2013-14	2223276	8.58	141797080	637.78

Source: Computed from Agriculture Statistics.

Findings and conclusions

The agriculture in the state is highly diversified due to comparative advantage of wide range of agro-climatic variability, the state produces many crops. Food grains production of Uttar Pradesh has increased 4.5 times during six decades but share of Uttar Pradesh decreased from 21 percent to 20 percent in India's food grains production. Cereals production has increased about 5 times due to extensive and intensive agriculture technique. The share of Uttar Pradesh in cereals production also decreased. Wheat and rice are the main food grains of Uttar Pradesh. Western region of Uttar Pradesh has more covered area under these crops. This crop covers more agriculture area in eastern region due to better irrigation facilities and sufficient rain fall. Pulses are the main source of protein for the weaker section of the society in the state of Uttar Pradesh and India but its production has reduced both in U. P. and India. This is not good sign for nutritional food security of human being. There are 9 types of Oilseeds. These are also needed for nutritional requirement of people but its production has also decreased during the above mentioned period because of low productivity area under these crops and inappropriate prices.

Potato is also a main cash crop of Uttar Pradesh especially in western region. The annual compound rate of potato was slightly higher after 1970s, production of this crop increased from 0.641MT in 1950-51 to 8.497MT in 2001 in Uttar Pradesh. While it was 1.660MT and 22.143MT at all India level during the same period . It increased almost 13 times in both U.P. and India. The share of U.P. in total potato production was constant. There is no doubt that productivity of different crops increased due to intensive agriculture technique. The impact of Green Revolution on agriculture productivity was noticeable in Uttar Pradesh. The average yield of food grains increased from 689 Kg/Ha in 1950-51 to 2498 Kg/Ha in 20011-12. This productivity is higher than national level. The average yield of cereals in Uttar Pradesh is also higher than India. The yield of wheat and rice increased from 821Kg/Ha & 519Kg/Ha in1950-51 to 3113Kg/Ha & 2358Kg/Ha in 20011-12 respectively. The productivity of potato went up by 3 times. The increment in yields of wheat and potato were much higher than other crops due to special impact of Green Revolution. There is possibility to increase yield of crops because actual yield of all crops are half of potential productivity.

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