
UNIT 14 TRENDS IN AGRICULTURAL PRODUCTIVITY

Green Revolution : Nature
and Extent

Structure

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14.0 OBJECTIVES

This Unit will enable you to:

- explain the trend in agricultural production;
- examine the trends in productivity;
- identify the causes of low agricultural productivity in India; and
- examine the measures taken to raise the level of productivity.

14.1 INTRODUCTION

At the time of Independence, agricultural situation in India could be characterised by low productivity of labour as well as land. The economy suffered from persistent food shortage with occasional famines. The rapidly growing population was creating a pressure on agricultural sector. Moreover, a very high proportion of the labour force was engaged in agriculture, which resulted in disguised unemployment and underemployment in rural areas. Irrigation facilities were non-existent for more than 80 per cent of the cultivated area. Agricultural economy of India was described as a “gamble in monsoon” because of the high degree of dependence on rainfall and the uncertainty of a good monsoon.

Technological backwardness of Indian agriculture was all pervasive. Tools and implements used were traditional and even primitive. Source of energy for agricultural

production was either animal power or muscle power with their obvious drawbacks. Cultivation techniques were largely traditional. Cowdung was the predominant source of manure.

In the absence of technological progress, production and employment in agriculture could be increased only by bringing more area under cultivation. This was causing a disturbance in the ecological balance leading to greater intensity of floods, droughts and soil erosion. Without improving the irrigation facilities, area under cultivation could be used only once when rain water was available. There was thus an intensely felt need for improving the production technology, the quality of seeds, storage facilities, etc. Without its modernisation, the agricultural sector was threatening to become a drag on the Indian economy.

We have learnt in Unit 5 that growth of the agricultural sector in India is necessary for a number of reasons. Firstly, it sustains a large proportion of work force which draws its income from agricultural activities. The incomes of this work force can rise only if the agricultural production and productivity grow rapidly. Secondly, agricultural sector provides vital support to the industrial sector by supplying raw-materials and food on the one hand and generating demand for industrial products on the other. Thirdly, agriculture still remains a very large sector of the Indian economy and its growth can give a thrust to the growth of the economy. Finally, growth in the agricultural sector will help generate surpluses which are vital for resource mobilization in the economy.

14.2 TRENDS IN AGRICULTURAL OUTPUT

As you know, agricultural output can be increased by two means, viz., (i) bringing in more area under cultivation, and (ii) increasing productivity of land. If land were abundantly available, agricultural production can be increased easily, given the surplus labour available in India.

However, increase in the area under cultivation is not without a limit. More and more area can be brought under cultivation only at the cost of reducing forest covers, green pastures, drainage channels for rain water, etc. All these are likely to have a negative impact on agricultural production because the ecological balance will be adversely affected. Thus, long term growth in agricultural production in India can be realised primarily by increasing the productivity or yield of land. Increase in productivity, thus, holds the key to growth in agricultural production in India.

14.2.1 Changes in Trends since Independence

You may be aware that India produces a variety of crops. Therefore, quantitative measurement of agricultural production becomes difficult because we cannot add up the production of different crops. Usually the growth of agricultural production is measured in terms of the changes in the index number of agricultural production. The index number of agricultural production gives a comparative picture on the level of production with respect to a stipulated base-year. Keeping in view the fact that agricultural output is subject to annual fluctuation, usually an average of a few adjacent years are taken as the base. An index number for a group of crops is obtained by combining individual production levels through suitable weights. The movement in this number provides us with an overall estimate of the growth rate in the crops included in the group. Let us examine the growth rates in production over time for all the crops and some major crop groups.

Table 14.1 : Growth Rate in Agricultural Production during 1949-50 to 1997-98**Green Revolution : Nature and Extent**

(All India, in Percentages, Base 1979-82 = 100)

Crop Period	All Crops	Foodgrains			Non-Food'grains		
		All Food	Rice	Wheat	Oilseeds	Fibres	All Non-foodgrains
1949-50 to 1997-98	2.68	2.50	2.67	5.47	2.77	2.40	2.98
1949-50 to 1964-65 (I)	3.15	2.82	3.50	3.98	3.20	4.56	3.74
1967-68 to 1997-98 (II)	2.88	2.39	2.85	4.59	3.60	2.68	3.35
1967-68 to 1980-81 (II-A)	2.19	2.15	2.22	5.65	0.98	2.53	2.26
1980-81 to 1997-98 (II-B)	3.23	2.58	3.06	3.57	5.36	3.63	4.45

Source: Agricultural Statistics at a Glance, Government of India.

Table 14.1 gives the compound rate of growth of production of (i) all crops combined together, (ii) foodgrains, and (iii) non-foodgrains. The table also shows the rate of growth of production of some major crop groups in foodgrains (wheat and rice), and non-foodgrains (oilseeds and fibres).

The period covered is 1949-50 to 1997-98. We have divided this period into two sub periods for our analysis, viz., i) Period I: 1949-50 to 1964-65, and ii) Period II: 1967-68 to 1997-98. Figures for 1949-50 to 1964-65 (Period I) show the growth in agricultural production before the adoption of new agricultural strategy known as the green revolution. The subsequent period, i.e., 1967-68 to 1997-98 (Period II) relates to the green revolution period. We should expect the figures to show the impact of green revolution on agricultural production during period II. This period has been further sub-divided into two sub-periods, i.e., 1967-68 to 1980-81, (Period II-A) and 1980-81 to 1997-98 (Period II-B) in order to examine the changes in the trends that may be taking place.

We observe from Table 14.1 that the overall rate of growth of agricultural production (foodgrains plus non-foodgrains) for the period 1949-50 to 1997-98 was around 2.68 per cent per annum. During this period the growth rate in non-foodgrains is 2.98 per cent per annum while that of foodgrains has been around 2.50 per cent per annum. Of the foodgrains, the rate of growth in the production of wheat has been very high, i.e., 5.47 per cent per annum whereas that of rice has been close to the average rate of growth for all crops, i.e., 2.67 per cent per annum. During this period the population growth in India has been around 2% per annum. Thus, the growth in per capita agricultural output has been negligible. We will discuss the issue of per capita availability and food security later in Unit 21.

A comparison between Periods I and II, i.e., pre-, and post- green revolution periods, shows that the rate of growth of production for all crops was higher for the pre-green revolution period (Period I). It was 3.15 per cent per annum as compared to 2.88 per cent per annum in the Period II. This tendency is visible for the foodgrains as well as non-foodgrains. It is only in the case of wheat that the compound rate of growth of production in Period I (3.98 per cent) was less than that in Period II (4.59 per cent). Another aspect of these rates of growth is that within the Period II, the rate of growth in production has been higher in Period II-B, i.e., between 1980-81 and 1997-98 in comparison to that in Period II-A, i.e., 1967-68 to 1980-81. This should give an idea that the rise in rate of growth is being maintained.

Table 14.1 also shows that wheat has experienced the highest rate of growth over the entire 49-year period. Moreover, the rate of growth in wheat production accelerated sharply, immediately after the introduction of the new agricultural strategy. The rate of growth in wheat production which was around 3.98 per cent per annum during period I, increased to 4.59 per cent per annum in Period II. Further analysis of Period II shows that growth rate of wheat production was higher during period II-A than Period II-B. Thus, the initial growth in wheat could not be sustained for a longer period. On the other hand, growth rate in rice production was lower in Period II than Period I. It declined from 3.50 per cent per annum in Period I to 2.22 per cent in Period II-A but later rose to 3.06 per cent in Period II-B. In fact, all the crop groups like oilseeds, fibres, and non-foodgrains, except wheat have experienced a higher rate of growth in production since 1980-81 as compared to the period between 1967-68 and 1980-81. We can infer that the gains from new agricultural strategy was initially confined to wheat but later steadily spread to all the crops. Secondly, there is a tendency for the rate of growth in agricultural production to accelerate.

14.2.2 Changes in Area Under Cultivation

As stated earlier, the increase in agricultural production can be attributed to an increase in either area under cultivation or yield per hectare. We shall examine how the increase in production at the rate of 2.68 per cent per annum during the period 1949-98 has been achieved. Here we will examine the contribution of i) increase in area under cultivation, and ii) yield per hectare to this rate of growth in agricultural production.

Table 14.2 shows the compound growth rate in area under cultivation for all crops as well as some of the major crops and crop groups.

Table 14.2 : Growth Rate in Area under Cultivation during 1949-98

(Base: Triennium Ending 1981-82 = 100; in percentage)

Crop Period	All Crops	Foodgrains			Non-Food grains		
		All Food	Rice	Wheat	Non-foodgrains	Oilseeds	Fibres
1949-50 to 1997-98	0.62	0.41	0.77	2.21	1.27	1.23	0.26
1949-50 to 1964-65 (I)	1.58	1.35	1.21	2.69	2.44	2.67	2.71
1967-68 to 1997-98 (II)	0.38	0.03	0.62	1.51	1.42	1.41	0.07
1967-68 to 1980-81 (II-A)	0.51	0.38	0.77	2.94	0.94	0.26	0.19
1980-81 to 1997-98 (II-B)	0.31	-0.28	0.52	0.81	1.98	2.35	0.45

Source: Agricultural Statistics at a Glance, Government of India.

It is important to note that during 1949-50 to 1997-98 the growth rate in production for all crops was 2.68 per cent per annum while the increase in area under cultivation was only 0.62 per cent per annum. Thus a very small proportion of the output growth has been contributed by the increase in area. You can see from Table 14.2 that the largest increase in area under cultivation was during the pre-green revolution period, i.e., Period I, which was to the extent of 1.58% p.a. Remember from Table 14.1 that during this period agricultural production increased by 3.15% p.a. Thus, the higher growth rate achieved during this period was largely contributed by the increase in the area under cultivation. However, we get a different picture in Period II when the increase in area under cultivation was only 0.38 per cent per annum compared to output growth of 2.88% p.a. The share of increase in area to the increase in production has fallen further in Period II-B.

A crop-wise analysis of the rate of growth in area under cultivation shows that during the Period I, i.e. 1949-50 to 1964-65 the area under most of the crop groups increased sharply. For non-foodgrains in general it increased at the rate of 2.44 per cent per annum. Thus the growth rate in area under cultivation was higher in the case of non-foodgrains than in foodgrains. For the foodgrain crops it increased at a rate of 1.35 per cent per annum. However, the area under wheat crop increased at almost double that rate, i.e., 2.69 per cent per annum. Even in the post-green revolution period the area under wheat crop has been rising rather sharply. For instance, while the area under foodgrains decreased at the rate of 0.28 per cent per annum during Period II-B, i.e., 1980-81 to 1997-98 the area under wheat was increasing at the rate of 0.81 per cent per annum. This may partly be due to shifting of area from other food crops to wheat as well as non-foodgrains.

The high growth rate achieved in non-foodgrains production in general and oilseeds in particular (see Table 14.1) during Period II-B is partly attributable to the rather high rate of growth in area under these crops during the same period. This implies that more areas have been diverted to cultivation of non-foodgrains.

On the whole, the growth rate in area was not a major factor for growth in agricultural production in India. It is only during the early years after Independence that increase in area under cultivation was fairly high. The increase in area is much less responsible for the increase in production in the post green revolution period as a whole.

14.2.3 Changes in Yield

Having analysed the role of the growth in area in the growth of production it is equally pertinent to examine the role of change in productivity. As there are limits to the expansion of area, increase in productivity is the major contributor to the growth in agricultural production over a long period of time in most of the countries. The same should be the situation pertaining to Indian agriculture.

The increase in productivity of important crop groups since Independence are given in Table 14.3. The time period and sub-periods are the same as the previous table.

Table 14.3 : Growth Rate in Productivity during 1949-98

(Base: Triennium ending 1981-82 = 100, in percentages)

Crop Period	All Crops	Foodgrains			Non-Food grains		
		Food gring	Rice	Wheat	Non-foodgrains	Oilseeds	Fibres
1949-50 to 1997-98	1.60	1.70	1.89	2.18	1.37	1.14	2.12
1949-50 to 1964-65 (I)	1.21	1.36	2.25	1.27	0.89	0.30	1.88
1967-68 to 1997-98 (II)	1.99	1.98	2.27	3.04	1.74	1.70	2.56
1967-68 to 1980-81 (II-A)	1.28	1.33	1.45	2.62	1.19	0.68	2.31
1980-81 to 1997-98 (II-B)	2.24	2.40	2.52	2.73	2.13	2.30	3.13

Source: Agricultural Statistics at a Glance, Government of India.

As mentioned earlier, the increase in agricultural production during the period 1949-50 to 1997-98 has been about 2.68 per cent per annum. The increase in area has been around 0.62 per cent per annum while the rate of growth in productivity has been around 1.60 per cent per annum. The increase in productivity was highest, i.e., at the rate of 3.18 per cent per annum for wheat crop. For the non-foodgrains in general the growth in productivity has been less than that in the foodgrains.

As stated earlier the rate of growth of production during the post green revolution period (1867-68 to 1997-98) was 2.88 per cent per annum. During this period the compound rate of growth in area was only 0.38 per cent whereas productivity increased at the rate of 1.99 per cent per annum. The sharpest rate of growth in productivity was for the wheat crop followed by that of fibres. Table 14.3 show that the rate of growth of productivity in the post green revolution period was higher than that in the pre-green revolution period.

Analysis of the sub-periods 1967-68 to 1980-81 (Period II-A) and 1980-81 to 1997-98 (Period II-B) shows that the compound rate of growth of productivity has been higher in the later period for all crops as well as for the different crop-groups. The increase in the production of foodgrains during this period is primarily due to the increase in productivity of the foodgrains. It must also be noted that since 1980-81 the rate of growth of productivity is more evenly spread and is not confined to wheat alone. The rate of growth of productivity of non-foodgrains in general and fibres and oilseeds in particular is much higher in Period II-B than in Period II-A

The increase in the productivity is no more confined to the North Western India. In Period II-B, i.e., 1980-81 onwards there has been a dispersal of the phenomenon of the growth in productivity to a number of regions. Foodgrains productivity has grown more sharply in some of the less developed areas of Central and Eastern India where the growth in yield per hectare was much less in the early phase of green revolution. In brief, with wider dispersal of the growth in productivity among different crops and regions, the sustained growth in agricultural production is a real possibility. It augurs well for the future growth of agricultural production.

Check Your Progress 1

- 1) Point out whether the following statements are true or false:
 - a) The scope for increasing agricultural production through increase in yield is limited.
 - b) Increase in area under cultivation is the only source of increase in agricultural production.
 - c) The rate of growth of agricultural production in the pre-green revolution period, i.e., 1949-50 to 1964-65 was higher than that in the post green revolution period 1967-68 to 1997-98.
 - d) Increase in productivity contributed more to the rate of growth of production in the post green revolution period.
 - e) Wheat is the only crop which continues to experience rapid growth in productivity. For all other crops this rate of growth in productivity is tending to slow down.
- 2) Briefly examine the trends in agricultural production since Independence.

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- 3) Briefly analyse the contribution of growth in yield to the growth in agricultural production in India since Independence.

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- 4) Examine the role of growth in the area under cultivation in increasing agricultural production in India since Independence.

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14.3 INTERNATIONAL COMPARISON OF AGRICULTURAL YIELD

After five decades of development planning and more than three decades after the adoption of new agricultural strategy the overall productivity in Indian agriculture is still very low. A comparison of productivity of some of the major crops in India with that in some other countries reveals that there is still a vast scope for raising the level of productivity in India.

A comparison of productivity of different crops between 1989-91 (average for three years) and 1998 is presented in the following table. These figures are drawn from the FAO year book of 1998 and show the vast difference in productivity between India and other countries (China, Japan, USA, etc.).

Table 14.4 : Productivity per hectare of Selected Crops

(in quintals per hectare)

Crop Period	Rice		Wheat		Groundnut		Cotton (Lint)	
	1989-91	1998	1989-91	1998	1989-91	1998	1989-91	1998
World Average	35	37	25	21	12	13	16	16
India	26	29	22	26	9	13	7	15
Asia	36	38	24	27	12	15	16	16
China	56	61	31	37	21	26	24	25
Japan	61	62	34	35	20	25	na	Na
USA	64	63	24	29	26	30	19	18
Egypt	71	85	49	60	22	27	21	21
Pakistan	23	28	18	22	11	11	19	16

Source: Agricultural Production Year Book, FAO.

Area under rice in India in comparison to other crops is the largest. In that sense it is the most important crop for the agricultural sector. However, productivity of paddy per hectare is very low. In the year 1998 it was less than 50% per cent of that in USA, Japan and China. In comparison to Egypt it was only 34 per cent. In comparison to the world as a whole the productivity level for rice was 85 per cent in India. A comparison with 1989-91, however, shows that China has achieved a growth in productivity of around 9 per cent. The growth in productivity was about 11.5 per cent in India and about 22 per cent in Pakistan.

The productivity situation in the case of wheat is comparatively better. The productivity in India in 1998 is more than the world average and slightly below the Asian average. However, it is less than that of China, Japan USA and Egypt. The growth in productivity of wheat witnessed in India was, however, not as much as that in China or Pakistan.

In the case of groundnut, a major oilseed, productivity in India is not only below the world average but is nearly one-third of that in USA and 40 per cent of that in Japan. It is below the average for Asia and is lower than that of other countries shown in the Table 14.4. The growth in the productivity of groundnut in India has been slower than that in China, Japan and Egypt.

Although India has experienced a sharp increase in the productivity of Cotton (a major fibre crop) it is still far below the productivity per hectare in China, Egypt and USA. It is slightly below that in Asian countries as a whole.

It should be evident from this comparative analysis of crop-wise yield in India with other countries that even after fifty years of Independence, the level of productivity is far below some other countries. It is important to note that productivity in China, another country with large population, far exceeds the productivity levels in India. Moreover, China is experiencing faster rate of growth in productivity in the case of several major crops. Indian agriculture needs to accelerate the rate of growth of agricultural productivity.

Check Your Progress 2

- 1) Point out whether the following statements are true or false.
 - a) Growth in agricultural productivity has been a major contributor to the growth in agricultural production.
 - b) The rate of growth in productivity of all crops since Independence has been more than 2 per cent.
 - c) The rate of growth of productivity in the case of foodgrains has been more than that for the non-foodgrains.
 - d) Rate of growth of productivity of most crops has tended to accelerate in the period since 1980-81.
 - d) Productivity of wheat in India in the year 1998 was more than the world average but less than the average for Asian countries.
- 2) Give a brief assessment of the growth in agricultural productivity in India. Are these trends encouraging for India?

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- 2) “A comparison of agricultural productivity levels in India with some other countries reveals the scope for improvement”. Examine.

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14.4 REGIONAL VARIATION IN PRODUCTIVITY

There is considerable variation in yield of crops across regions in India. For a crop, say rice, average yield per hectare is not the same in all the states. You may be aware that yield of wheat per hectare of land in Punjab and Haryana are quite high; almost comparable to that of developed countries. On the other hand, yield of wheat in Punjab is nearly double of that in Bihar.

Table 14.5 : Yield and Area under Crops at the State Level (1998-99)

(Yield in kg/hectare; Area in thousand hectares)

State	Rice				Wheat				Foodgrains			
	Yield	Index	Area	% of GCA	Yield	Index	Area	% of GCA	Yield	Index	Area	% of GCA
Andhra Pradesh	2601	138	4109	30.6	720	26.9	12.5	0.1	1877	116.3	7286	54.3
Assam	1340	71	2491	62.6	1330	49.6	87.9	2.2	1290	79.9	2729	68.6
Bihar	1437	76	5067	50.0	2183	81.5	2089	20.6	1593	98.7	9049	89.2
Gujarat	1470	78	642	5.8	2300	85.9	581	5.3	1303	80.7	3997	36.3
Haryana	2964	157	831	13.7	3880	144.8	2017	33.2	2482	153.8	4027	66.3
Karnataka	2364	126	1358	11.0	766	28.6	248	2.0	1250	77.4	7371	59.8
Kerala	1960	104	425	14.1				0.0	1877	116.3	454	15.0
Madhya Pradesh	1100	58	5396	21.2	1800	67.2	4327	17.0	1103	68.3	17666	69.4
Maharashtra	1770	94	1478	6.8	1460	54.5	799	3.7	1058	65.6	13802	63.5
Orissa	993	53	4469	54.4	1320	49.3	5	0.1	903	55.9	5351	65.1
Punjab	3400	181	2159	27.5	4230	157.9	3229	41.2	3786	234.6	5693	72.6
Rajasthan	1180	63	147	0.7	2740	102.3	2474	12.0	998	61.8	12851	62.1
Tamil Nadu	2670	142	2174	33.7				0.0	1948	120.7	3558	55.1
Uttar Pradesh	2120	113	5549	21.2	2670	99.7	9014	34.5	2088	129.4	20301	77.7
West Bengal	2180	116	5801	64.0	2390	89.2	351	3.9	2135	132.3	6444	71.1
India	1882	100	43433	22.9	2679	100.0	25887	13.7	1614	100.0	12358	165.2

Source: Economic Survey of India, 2002-03

The yield of foodgrains in India for the year 1998-99 was 16.2 quintals per hectare. You can observe from Table 14.5 that among the major states Punjab had the highest yield in foodgrains while the lowest was in Orissa. Moreover, you can see that the yield of foodgrains in Punjab was more than 4 times of that in Orissa. Of the major states Andhra Pradesh, Haryana, Kerala, Punjab, Tamil Nadu, Uttar Pradesh and West Bengal had higher yield than the national average. On the other hand, Assam, Bihar, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Orissa and Rajasthan had lower yield than the national average.

We see that there is a strong linkage between the level of development of a state and yield of foodgrains. The developed states generally have higher yield also. There are some exceptions such as Gujarat and Maharashtra where yield is lower than national average although these states have comparatively higher per capita income and level of development.

In Table 14.6 we present the yield of foodgrains per hectare for the years 1970-71, 1980-81, 1990-91 and 1998-99. Column 6 in the table shows the yield in 1998-99 as a ratio of 1970-71. We see from the table that compared to 1970-71 yield of foodgrains in 1998-99 has been nearly two fold (1.9 times) on an all-India average basis. Andhra Pradesh, Haryana, Maharashtra, Punjab and Uttar Pradesh have been able to increase yield of foodgrains at a higher rate than the national average. On the other hand, Assam, Kerala, Orissa and Rajasthan have achieved very little growth in yield of foodgrains. The growth in yield in the case of Kerala and Maharashtra is quite in contrast. Kerala had a yield of 1430 kg/ha in 1970-71 which was nearly 3 times that of Maharashtra. However, in 1998-99 this ratio for Maharashtra has been narrowed down to less than 2. Among the 15 major states given in Table 14.6, Kerala has slipped down from the second rank (in terms of yield of foodgrains) in 1970-71 to the ninth rank in 1998-99.

Traditionally the states in the eastern part of the country are rice producing. The area under rice crop in the states of Assam, Bihar, Orissa, and West Bengal are more than 50% of GCA of these states. However, yield of rice in these states is quite low compared to that in Punjab and Haryana (see Table 14.5) Punjab and Haryana are traditionally wheat-producing states. In the 1960s they were considered to be not suitable for production of rice. However, development of new varieties of rice suitable for dry and cold climate did wonders in these states. You can see from Table 14.5 that yield of rice in Haryana and Punjab is quite high compared to that in Orissa and Bihar.

Table 14.6 : Yield of Foodgrains over time

(in kg/hectare)

State	1970-71	1980-81	1990-91	1998-99	1998-99/1970-71
1	2	3	4	5	6
1 Andhra Pradesh	780	1140	1590	2000	2.6
2 Assam	970	1070	1270	1290	1.3
3 Bihar	800	990	1300	1440	1.8
4 Gujarat	860	1000	1050	1430	1.7
5 Haryana	1240	1520	2350	2700	2.2
6 Karnataka	830	890	910	1350	1.6
7 Kerala	1430	1540	1870	1770	1.2
8 Madhya Pradesh	650	700	1000	1110	1.7
9 Maharashtra	430	690	850	970	2.3
10 Orissa	880	870	1000	1080	1.2
11 Punjab	1860	2460	3390	3740	2.0
12 Rajasthan	690	530	860	960	1.4
13 Tamil Nadu	1340	1340	1910	2280	1.7
14 Uttar Pradesh	1000	1220	1740	1960	2.0
15 West Bengal	1220	1360	1740	2200	1.8
India	870	1020	1380	1620	1.9

Source: Economic Survey of India, 2002-03

14.5 CAUSES OF LOW AGRICULTURAL PRODUCTIVITY IN INDIA

Ever since Independence the policy makers have stressed the need for a rapid increase in agricultural productivity. For this purpose it was necessary to identify the factors responsible for the low level of productivity and eliminate them to the extent possible. The factors responsible for the low productivity of land in Indian agriculture have been generally divided into four categories. These are:

- a) Institutional deficiencies
- b) Technological backwardness
- c) Sociological and general factors
- d) Accumulated backlog of investment

We examine the impact of each one of these factors on agricultural productivity.

14.5.1 Institutional Deficiencies

These deficiencies refer to the inherent weaknesses of the agricultural system and its operations. The aspects of the system which particularly affect its working and progress are: (i) the land-relations system, (ii) the credit and marketing system, and (iii) absence of the growth impulses in the economy.

A detailed study of the system of agrarian relations was taken up in Block 1. We may briefly examine how this system adversely affected agricultural productivity. The landowning classes, before Independence, used their ownership rights to their advantage. In a situation of rapidly growing population, the demand for land was on the rise. The conditions of tenancy of the cultivators were largely unsettled with very few cultivators having hereditary rights. The landowners, thus, were able to escalate rents on land. The cultivators were drained of all the capacity to make any improvement on land. The landowners themselves were also not interested in making any such improvements in view of their ability to raise rents. The distribution of land was also highly unequal and the owners used the abundant labour situation in the rural areas entirely to their advantage. Attempts were made immediately after Independence, to redress this situation through a set of measures generally known as land reforms. Measures like the abolition of intermediaries, tenancy reforms to provide greater security of tenure to the cultivators, regulation of land rents and some efforts to redistribute land by imposing ceiling on land holdings have been adopted. These have only been partially successful and quite often a near failure.

Highly usurious credit system and lack of easy access to the markets were the other factors responsible for low agricultural productivity. In the absence of a marketing system, the producer is unable to get the full value of the produce. The intermediaries in the market corner most of the gains leaving little incentive for the producer to produce more. High cost of credit and its inadequacy were also making it impossible for the cultivators to make any improvement on land. These issues will be discussed in detail in Block 5.

Absence of significant growth and industrialisation of the Indian economy acted as a systemic weakness which caused agriculture to bear the brunt of a growing labour force. More and more labour remained tied to agriculture in the absence of employment opportunities in non-agricultural sectors. Most of the additional labour force did not add to the agricultural production, they only shared the existing work opportunities.

It was fairly evident that the agricultural system was crumbling because of its inherent weaknesses. In the post-independence era, therefore, stress was laid on the need for

removing some of these weaknesses. While we are not making an assessment of the success of the measures taken to eliminate the institutional deficiencies in Indian agriculture we shall enumerate some of them in the following section.

14.5.2 Technological Backwardness

You have learnt from Unit-12 that technological backwardness of the Indian agriculture is an important factor causing low productivity. Backwardness of technology is reflected in traditional tools and implements as well as source of energy. Wooden plough and a pair of bullocks have remained the predominant means of carrying on cultivation operations. Although some mechanisation of agricultural operations has taken place since Independence, the overall use of tractors, harvesters, dryers and other mechanical devices has been confined to a few regions. The farmers in a large majority continue to use the age-old tools and implements.

Besides the use of traditional tools and equipment at the dawn of Independence, use of fertiliser was almost confined to manures based on cow dung. Even though the use of chemical fertilisers has received a fillip particularly since the application of new agricultural technology since 1966-67, the use of such fertilisers is highly unevenly spread across regions.

Agricultural operations depend critically on the supply of water and cultivation operations are deeply dependent on the moisture levels of the soil. Water has, therefore to be applied to soil in appropriate quantities and at appropriate times. In a predominantly rain-fed system of irrigation this is difficult to achieve unless rainfall always comes at the right time and in right intensity. Any deviation from this, causes problems and has a harmful impact on productivity. More than 80 per cent of the area under cultivation at the time of Independence and almost 66 per cent of the cultivable area at present is dependent on rainfall for irrigation. The improvement in irrigation facilities has increased the intensity of cultivation on the irrigated land. On a large part of such land, more than one crop and in some cases even three crops are being harvested. But the area which is dependent on rainfall continues to remain a large proportion of the total cultivated area. The average productivity for the country as a whole, therefore, continues to remain low.

14.5.3 Sociological and other Factors

Indian agricultural system is closely related to the social system that governs the community engaged in agricultural activities. India's village community is governed by caste divisions and social hierarchy within the community. Religious attitudes and social rituals besides the social traditions bind the community with tradition and act as hurdles in the way of modernization. Religious and social rituals connected with birth, deaths and marriages breed expenditure which is often financed by borrowing. The repayment capacity being non-existent in most cases leads to transfer of land and growth of landless labour. Similarly rapid growth of population and inheritance laws lead to sub-division of land holdings which are becoming too small to remain economic for any family. There is a significant waste of social resources in the rural areas because some of the community services are divided on caste or communal lines. General apathy towards female education in particular and education of children in general has its inherent social weakness. This in turn has a harmful impact on the future growth of population and agricultural productivity. Excessive social divisions do not enable cohesive social action for the modernisation of attitudes and reducing the rigors of labour through improvements in technology. Absence of health services, drinking water, all weather roads add to the general environment of apathy towards change.

14.5.4 Accumulated Backlog of Investment in Agriculture

One of the important factors behind the continuation of low productivity in Indian agriculture is the long period of neglect of the investment requirements. Public sector investment was minimal almost throughout the British rule in India. Whatever investments were undertaken were to overcome the chronic famine conditions that started emerging towards the end of the nineteenth century. But the progress towards building up the irrigation projects was very slow and almost negligible. Private sector investment in agriculture was also not undertaken because the landowners were able to exploit the system to their advantage and did not have any interest in making investments.

Immediately after Independence measures were taken to redress this situation. But the long period of neglect and the vast size of the agricultural sector called for massive investments to overcome the backlog. For a poor economy, mobilising enough resources for rapid industrialisation and overcoming the problems of agriculture caused by accumulated backlog of investment were daunting tasks. Efforts to build up multipurpose river valley projects with an objective to harness water resources for irrigation, supply of hydroelectric power and control floods were made. The investment involved was, however, massive. There was also the problem of displacement of population that such schemes invariably involved.

On the whole, the public sector investment to improve irrigation system in the post-Independence period was much more than that in the pre-Independence period. But the overall effort was not enough to undo the damage done by long period neglect of the agricultural sector. The existing canal system had to be improved and refurbished. The technology had to be researched and carried from laboratory to the land. Resources had to be generated for dispersion of new technology. Community services had to be improved. The agricultural sector continued to suffer from lack of adequate investment. The priority accorded to agriculture in the plans remained lower than that of industry.

Check Your Progress 3

- 1) Point out whether the following statements are true or false.
 - a) Landowners charged such high rents that very little was left with the cultivators for investment after meeting their subsistence needs.
 - b) Irrigation sources had developed to a fair extent during the British rule.
 - c) British rulers invested large sums for the development of agriculture in India.
 - d) Technological backwardness still prevails on a large number of farms.
 - e) Rural sociological conditions are also responsible for low productivity in agricultural in India.
- 2) Explain the role of technological backwardness in causing low agricultural productivity in India.

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- 3) Comment on the sociological factors contributing to the persistence of low agricultural productivity in India.

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14.6 MEASURES TO RAISE PRODUCTIVITY

It is now relevant for us to identify the measures that have been taken to increase agricultural productivity. The measures taken so far to overcome institutional deficiencies, technological backwardness and infrastructural problems vitiating the agricultural economy have no doubt contributed to the increase in productivity that has been witnessed. However, what extra efforts need to be done are discussed below.

14.6.1 Institutional Measures

On the institutional front, the urgency to bring about comprehensive change in land relations was realised even before Independence. Land reform measures in the form of abolition of intermediaries, tenancy reforms to provide security of tenure, regulate land rents and confer ownership rights on the cultivators have been only partially successful. Measures to impose ceilings on land holdings have not been very effective. Measures to consolidate fragmented holdings have been successful only in some regions. The importance of effective institutional reforms is fully recognized but various legal hurdles and political pressures have been responsible for the lack of success in this respect.

The role of the land reform measures is however, not to be negated. The abolition of intermediaries (namely Zamindars) made considerable impact and a large number of cultivators got benefited. Even tenancy reforms and ceilings on land holdings have been implemented with some degree of success in some states. The sluggishness in the implementation of the land reform measures in some states particularly the central and western India has to be overhauled. Without the implementation of land reforms other measures for the improvement in productivity will only have a limited impact.

14.6.2 Technological Changes

Even though high priority was accorded to institutional reforms immediately after Independence, there was also a great stress on harnessing the abundant water resources of the country through multipurpose river valley projects. Large irrigation projects like Bhakra Nangal Project, Hirakund Project and Damodar Valley Project have become not only major sources of irrigation but also of flood control and supply of hydro-electric power.

By the mid-sixties, particularly after the 1965 War with Pakistan, the need for food security was realised. The excessive dependence on food import became a source of strategic weakness. The successive years of droughts had further accentuated the problem. It was therefore realised that immediate measures to raise productivity particularly of foodgrains, should be undertaken.

14.6.3 Infrastructural Changes

There has been a significant growth and dispersion in the infrastructure serving agricultural sector. This has facilitated the growth in productivity in the sector.

First, marketing system in the country for agricultural products has been considerably streamlined. At present there are about 7062 regulated markets for agricultural products. Grading and standardisation of the products is being promoted and nearly 162 agricultural and allied products have been graded National Agricultural Cooperative Marketing Federation of India (NAFED) has been extending support to the farmers for various types of commodities. It has encouraged the marketing of agricultural produce through cooperatives.

Secondly, the agricultural sector has also received considerable financial support from the banking sector. This has, to some extent, reduced the dependence of farmers on the extortionist money lending system which had been draining the agricultural sector of its resources. Several schemes to facilitate the supply of credit to farmers have been undertaken to ensure smooth growth of agricultural production.

Third, several other schemes and measures which tend to reduce the gaps between the rural and urban areas are also likely to facilitate the growth of productivity and general attitude towards modernisation. Electrification of villages, improvement of telecommunication in the rural areas, augmenting the health services are all expected to facilitate the increase in productivity.

14.6.4 State Policies

The concern of the state and central governments for the agricultural sector and its progress is reflected in the policy measures. Besides providing institutional support the government has introduced such schemes as crop insurance and price support. Moreover, the agricultural research programmes of IARI (Indian Agricultural Research Institute) have been responsible for generating a desire for modernization of agricultural operations.

Increase in public investment in the agricultural sector in the post-Independence period particularly till the end of decade of the 1970s has been responsible for bringing about some changes in the agricultural sector. This investment has not, however accelerated at the desired rate and public investment in the agricultural sector has been more or less static in the nineties.

The overall growth in the economy has not been such as to release the pressure of growing population on agriculture. The natural growth of population has its immediate impact on the agricultural sector. This sector continues to support nearly two thirds of the workforce in India directly and a large proportion indirectly. The slow industrial growth and its pattern has not generated adequate employment opportunities to release this pressure on agriculture. Consequently, a large segment of the agricultural sector continues to remain unaffected by the technological and other developments.

Check Your Progress 4

- 1) Which of the following are not measures promoting the growth of agricultural productivity?
 - a) Introduction of HYV seeds
 - b) Abolition of intermediaries
 - c) Flood relief measures
 - d) Irrigation facilities provided through multipurpose river valley projects.

- 2) Point out whether the following statements are true or false:
- a) Land reforms have had no impact on agricultural productivity
 - b) Technological changes after the adoption of new agricultural strategy affected growth in the productivity in the decade of seventies only.
 - c) Infrastructural changes in the area of marketing of agricultural produce have facilitated growth in agricultural productivity.
 - d) Public investment in the agricultural sector in the decade of nineties has been static.
- 3) Comment on the role of technological improvements in promoting the growth of agricultural productivity in India since Independence.

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- 4) Briefly discuss the role of land reform measures in promoting agricultural productivity in India.

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14.7 LET US SUM UP

Indian agriculture, at the time of Independence was in a state of decay and there were no signs of growth. In the post Independence period the long period growth rate of agricultural production has been around 2.7 per cent per annum. The rate of growth of area under cultivation was only 0.62 per cent per annum whereas that of the productivity was 1.60 per cent per annum. There is significant difference in the growth rate of productivity in the post-green revolution period as compared to the earlier period. The growth of productivity in the case of foodgrains and other crops are also improving.

Despite the growth in productivity the current levels of productivity in India are much below the levels of productivity in developed and many developing countries. There is thus a vast scope for improvement in productivity. Low productivity in agriculture in India is attributed to the exploitative land relations, backwardness of technology and certain social factors besides the neglect of agricultural investment in pre-Independence period. In the post-Independence era measures to improve the agrarian relations through land reforms, technological improvement in the shape of new agricultural strategy, strengthening of marketing and financial infrastructure as well as other policy measures adopted by the government have had a limited impact on the agricultural performance and prospects.

The overall rate of growth of nearly 2.7 per cent per annum in agricultural production since 1949-50 may be much higher than the rate of growth experienced in the first

half of the twentieth century. However, the low growth rate in agriculture is responsible for keeping the rate of economic growth in India much lower than required. Some of the advantages of growth in production experienced since Independence are however important to note. The Indian economy has been able to become largely free of food imports, which were undermining the food security of the country. High rates of growth of food production have also helped in reducing the impact of inflationary pressures.

The spread and dispersion of the growth in production and productivity in recent years has given a hope that technological change is being adopted in more regions. But, for a continued dispersal of this technology land reforms have to be carried on to fulfill their objectives. Without the land reforms the benefits of new technology will remain limited to the rich farmers alone.

14.8 KEY WORDS

Base Year	:	It implies the reference year with reference to which changes are measured.
Compound Growth Rate	:	It is the average rate of growth experienced for a period of time. It is calculated on the same basis as the compound rate of interest 'r' between two periods (t and 0) given by $P_t = P_0 (1 + r)^t$.
Crop-group	:	Means a group of crops belonging to the same general category. For example, foodgrains is a crop-group including such crops as rice, wheat, maize and millets Similarly, fibres is a crop group consisting of several crops like cotton, jute and mesta.
Triennium	:	It is a period of three years. In this case Triennium ending 1981-82 = 100 means the base year is the average levels of production for the years 1979-80, 1980-81 and 1981-82. This three-year average is taken to ensure that the base year is not affected by abnormal fluctuations.
Usurious Credit System	:	A credit system based on excessively high rates of interest.
Yield	:	Production per unit of land. For example, if a farmer produces 60 quintals of wheat from 2 hectares of land then yield of wheat is 30 quintals per hectare.

14.9 SOME USEFUL BOOKS

Agrawal, A.N. and Kundan Lal (1990): *Rural Economy of India: Problems, Progress and Prospects*, Vikas Publishing House, New Delhi.

Agrawal A.N. (1999): *Indian Economy: Problems of Development and Planning*, Vishwa Prakashan, New Delhi.

Datt, Ruddar and K.P.M. Sundharam (1999): *Indian Economy*, S. Chand & Co., New Delhi.

Mishra, S.K. and V.K. Puri (1999): *Indian Economy*, Himalaya Publishing House, Bombay.

14.10 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) a) F b) F c) T d) T e) F
- 2) Draw your answer with reference to section 14.2.1.
- 3) Refer to Sub-section 14.2.3.
- 4) Refer to Sub-section 14.2.2.

Check Your Progress 2

- 1) a) T b) F c) T d) T e) T
- 2) Draw your answer by referring to Sub-section 14.2.3 and Section 14.3
- 3) Refer to Section 14.3.

Check Your Progress 3

- 1) a) T b) F c) F d) T e) T
- 2) Refer to Sub-section 14.5.2.
- 3) Refer to Sub-section 14.5.3.

Check Your Progress 4

- 1) c
- 2) a) F b) F c) T d) T
- 3) Refer to Sub-section 14.6.2.
- 4) Refer to Sub-section 14.6.1.