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AGRICULTURAL GROWTH IN WEST BENGAL

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Abstract

West Bengal is one of the major agricultural states in India. Adoption of new agricultural technology has contributed considerably to the economic growth of the state since the early 1980's. A major change in the rice-economy of West Bengal in the Green Revolution period was the sudden spurt of growth in both rice area and rice production. The state has contributed more than 15 percent of India's total rice production in 2015-16. Apart from rice, the dominant food crop, West Bengal produces a number of cereals and pulses. But as a result of the overwhelming importance of rice, total foodgrains production growth in West Bengal followed that of rice closely. The non-foodgrains component also expanded substantially over the last five decades as a result of modern technology.

Key words: Agricultural Growth, Technological Change.

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Agricultural Growth in West Bengal

Indian agriculture has come a long way in terms of development over the last six decades. So far as agricultural growth is concerned, the country has varied widely in different regions. The Eastern region had been trailing behind the rest of the country in agricultural growth for a long time. However, since the early 1980s West Bengal virtually broke off from the rest of eastern India and attained impressive rates of agricultural growth. West Bengal has a total area of about 89,000 square kilometers. About 65 percent of the total area of about 5.78 million hectares of land is cultivable and about 5.4 million hectares is under crops at present.

The agricultural sector of the state is characterised by the predominance of small and marginal farmers. In 1970-71, 60 percent of the holdings were marginal with size below one hectare and representing only 21 percent of the cultivable area, while marginal and small holdings together were 72 percent of total holdings with about 47 percent of cultivable area (Government of West Bengal and INSPARC, 2001). According to the 2010-11 Agricultural Census, West Bengal has 82 percent of land holdings with size below one hectare and 96 percent of holdings are below two hectares, belonging to the marginal and small categories.

West Bengal having 3 percent of the country's cultivable land contributed more than 7 percent of the total foodgrains production of the country in 2015-16 (up from 6.4 percent in l980-81) [Table 1]. In rice production, the contribution of West Bengal to the national economy is more than 15 percent in 2015-16. The state's share in

Table 1

Share of West Bengal to All-India: Production of Major Crops

Crops	1980-81	1990-91	2000-01	2010-11	2015-16
Rice	13.9	14.1	14.6	14.0	15.3
Wheat	1.3	1.0	1.5	1.0	1.0
Pulses	2.3	1.4	2.0	1.0	2.0
Total Food Grains	6.4	6.4	7.0	6.1	7.1
Oilseeds	5.3	7.1	10.8	2.2	3.7
Potato	20.4	29.5	34.7	31.7	N.A.
Jute & Mesta	57.6	60.1	71.2	77.4	74.3

Source: Government of West Bengal, (Various Years); Government of India, (Various Years).

production of wheat is not remarkable. The production share of pulses shows irregular pattern during 1980-81 to 2015-16. In non-foodgrains, the production share of jute and potato increased remarkably. On the other hand, the production share of oilseeds increased during 1980-81 to 2000-01 but declined thereafter.

Among the principal crops, foodgrains in 2015-16 occupied about 66 percent of gross cropped area in West Bengal. Among these, rice is the most important crop occupying about 87 percent of gross cropped area under foodgrains in 2015-16 and contributing about 89 percent of total quantity of foodgrains in the state.

During 1950-51 to 2000-01, total rice production in West Bengal increased at a trend growth rate of 2.55 percent per year. In order to identify the major turning points in growth the overall period can be broken up into two sub-periods: (i) Pre-Green Revolution period from 1950-51 to 1966-67 and (ii) Post- Green Revolution from 1966-67 to 2000-01. The trend rate of growth of total rice production increased from 2.08 percent during pre-GR period (1950-51 to 1966-67) to 3.05 percent per year in post-GR period (1966-67 to 2000-01). A major change in the rice-economy of West Bengal in the Green Revolution period was the sudden spurt of growth in boro rice production since 1966-1967. While the growth rate was 5.88 percent per year during 1950-51 to 1966-67, it rose to 9.39 percent in the post Green Revolution period (Table 2).

Table 2

Trend Rate of Growth in Rice Production: West Bengal, 1950-51 to 2000-01

Period	Total Rice	Boro Rice
1950-51 to 2000-01	2.55	7.05
1950-51 to 1966-67	2.08	5.88
1966-67 to 2000-01	3.05	9.39

Source: Government of West Bengal, (Various Years).

Note: Trend rate of growth percent per year is calculated as r in Ln Y=a+rt, where Y=production and t=year.

Composition of rice production and rice area changed over the period. Boro rice gained in both area and production. Prior to Green Revolution boro had only 0.6 percent of total rice area contributing 0.8 percent of output, while in 2000-01 these shares were 25.8 and 36.5 percent of area and production, respectively (Table 3).

Table 3

Share of Boro in Total Rice Area and Production: West Bengal (1951 to 2016)

Year	Area	Production
1950-51	0.42	0.40
1966-67	0.59	0.83
2000-01	25.79	36.54
2010-11	27.71	33.66
2015-16	23.73	27.77

Source: Government of West Bengal, (Various Years).

Growth in output can be broken up into two components: change in area and change in yield. During 1950-51 to 1997-98, 33 percent of total rice production was due to increase in area signifying that the remaining 67 percent of increase in production was due to increase in yield (Government of West Bengal and INSPARC, 2001). The higher contribution of yield is expected with the adoption of land-saving and yield-increasing technology. The new technology spread to a large extent by replacing traditional technologies as water control and necessary inputs became available, and thus increased production has been mainly due to technology.

However, in 2010-11, though the share of boro rice area increased to 27.7 percent but the share of production declined to 33.7 percent. In 2015-16, both the shares declined to 23.7 and 27.8 percent of area and production respectively (Table 3). The decline in boro rice production may be an indication of the falling impact of the new agricultural technology on boro rice.

Apart from rice, the dominant food crop, West Bengal produces a number of cereals and pulses. But as a result of the overwhelming importance of rice, total foodgrains production growth in West Bengal followed that of rice closely. The overall trend rate of growth of total foodgrains production during 1971-72 to 2000-01 was 2.9 percent (Table 4).

Table 4

Trend Rate of Growth of Total Foodgrains Production: West Bengal, 1971-72 to 2000-01

Period	Annual Rate of Growth (%)
1971-72 to 1976-77	1.38
1976-77 to 2000-01	3.39
1971-72 to 2000-01	2.90

Source: Government of West Bengal, (Various Years).

Though our focus is mainly on the major crop of rice and total foodgrains, West Bengal's agricultural sector produces several non-foodgrain items. The non-foodgrains component has expanded substantially over the last four and a half decades. This has been due to expansion in both area and yield (Table 5) as a result of modern technology. During 1971-2016, the non-foodgrains area has increased by 134.6 percent (846.5 thousand hectares in 1970-71 to 1985.5 thousand hectares in 2015-16). So far as increases in the yield of oil seeds and fibre are concerned, the percentages are 234 and 118 respectively for the same period. Since the early 1970's there has been a rising trend in India in the share of the non-foodgrains sector in agriculture at both national and state levels reflected in both area and production (Table 6).

Table 5

Area and Yield of Non-foodgrains: West Bengal (1971-2016)

Year	Area ('000 hectares)	Yield	
		Oil Seeds (Tonnes/hectare)	Fibre (Bales/ hectare)
1970-71	846.5	0.35	6.46
1980-81	1216.6	0.47	7.17
1990-91	1345.1	0.88	10.86
2000-01	1666.7	0.95	12.00
2010-11	1778.2	1.05	14.31
2015-16	1985.5	1.17	14.08

Source: Government of West Bengal, (Various Years).

Table 6

Change in Share of Non-foodgrains to Total Gross Area:

West Bengal and India, 1970-73 to 1992-95

	1970-73	**1980-83**	**1992-95**
West Bengal	12.32	16.63	19.35
India	22.06	23.37	27.79

Source: Bhalla and Singh, 1996.

In West Bengal the percent share of non-foodgrains in total gross area cultivated increased from 12.3 in 1970-73 to 19.3 in 1992-95. At the all India level during the same period the share of non-foodgrains to total gross area increased from 22 to 28 (Bhalla and Singh, 1996).

Agricultural modernization through the adoption of modern variety crops leads to increased cropping intensity and higher productivity, and as a result employment opportunities increase. Cropping intensity for both West Bengal and India appears to have increased during the last decades. West Bengal's cropping intensity increased from 1.31 in 1971-72 to 1.85 in 2014-15 compared with all India average of 1.18 to 1.42 during the period (Table 7).

Table 7

Cropping Intensity: West Bengal and India (1971-72 to 2014-15)

	1971-72	**1981-82**	**1990-91**	**2000-2001**	**2010-11**	**2014-15**
West Bengal	1.31	1.33	1.59	1.68	1.77	1.85
India	1.18	1.25	1.30	1.31	1.40	1.42*

Source : CMIE, 1996 ; Government of West Bengal, 2016; Government of India, 2018.

Note: * Figure for 2013-14.

In terms of aggregate agricultural output growth, West Bengal recorded a rate of 2.99 percent during 1962-95 compared with 2.71 percent in all India level (Table 8). During 1980-95 West Bengal's agricultural growth has been among the highest (5.39 percent) in India (Bhalla and Singh, 1996).

Table 8

Annual Percent Compound Growth Rate of Total Agricultural Output: West Bengal and India (Value at 1990-93 prices)

	1962-65 to 1970-73	**1970-73 to 1980-83**	**1980-83 to 1992-95**	**1962-65 to 1992-95**
West Bengal	2.37	0.68	5.39	2.99
India	2.08	2.38	3.40	2.71

Source: Bhalla and Singh, 1996.

In West Bengal, agricultural growth contributed significantly to overall economic growth of the state since the early 1980s. This is expected as the period before 1980 there was not any significant technological change in agriculture took place in the state. The growth rates of production, yield and area for the major food and non-food crops in West Bengal during 1981-2006 are shown in Table 9. The output growth of foodgrains and also of rice in West Bengal was primarily yield driven. The growth in wheat production was primarily because of the expansion of

Table 9

Trend Growth Rate of Production, Yield and Area: Foodgrains and Non-foodgrains (1981-2006)

	Foodgrains				**Non-foodgrains**		
	Total Foodgrains	Rice	Wheat	Pulses	Oilseeds	Potato	Jute
Production	2.9*	3.5*	1.8*	-1.4*	4.3*	4.7*	3.2*
Yield	3.0*	3.0*	0.3	1.2*	2.1*	0.2	2.1*
Area	-0.1	0.5*	1.5*	-2.6*	2.2*	4.5*	1.1*

Source: Das, 2010.

Note: *Indicates significant at less than 1% level.

area under this crop (Das, 2010). Although yield rate of pulses increased during the period, but area declined at a higher rate. Output growth of oilseeds was mostly due to the higher yield rate and expansion of area. The growth rate of potato production at higher rate was mainly due to the increase in area under this crop. The growth rate of jute production in West Bengal during the period was due to the increase in both yield and area.

Technological change in West Bengal agriculture as evidenced by rising yield and production has had a major impact on labour demand. This may be seen from the growth in real wages of labour in the state (Table 10).

Table 10

Rate of Growth in Real Daily Wages of Male and Female Agricultural labourers, deflated by CPIAL, AWI (percent per month)

District	Male Wage				Female Wage			
	to June 1970	to June 1980	to June 1990	to June 2000	to June 1970	to June 1980	to June 1990	to June 2000
Burdwan	-0.02	0.15*	0.43*	-0.16*	0.01*	0.24*	0.30*	0.79*
Coochbehar	-0.02	0.01	0.39*	0.48*	-0.02	-0.07*	0.24*	0.41*
Purulia	-0.06*	0.46*	0.18*	1.51*	-0.04*	0.72*	-0.03*	0.77*

Source: Chavan & Bedamatta, 2006.

Note: *Indicates co-efficient in the growth equation to be significant at 10% or less.

Dissemination of the new technology has induced rapid rate of agricultural development. A major change in the rice-economy of West Bengal in the Green Revolution period was the sudden spurt of growth in both rice area and rice production. The new agricultural technology spread to a large extent by replacing traditional technologies and increased production

considerably. As a result of overwhelming importance of rice, total foodgrains production growth in West Bengal followed that of rice closely. The non-foodgrains component also expanded substantially over the last five decades as a result of modern technology.

A major weakness of planning for development in India has been an inadequate attention paid to linkage among policy areas for sustainable development. Continued research for development of newer agricultural technologies must be encouraged so that the upward trend of agricultural incomes is maintained even in the face of possible contraction of agricultural areas due to industrialization. The need of the day is for propagation of high value crops as well as improved technologies.

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