The Social Science Review A Multidisciplinary Journal. September-October, 2026. Vol. 4. Issue 5. 372-377

Published by: Pather Dabi Educational Trust, (Regn No: IV-1402-00064/2023), Under Govt. of West Bengal, India

The Social Science Review
A Multidisciplinary Journal
ISSN: 2584-0789
(Open-Access, Peer-Reviewed, Refereed, Bi-Monthly, International e-Journal)
Homepage: www.tssreview.in

A DISTRICT-LEVEL STUDY ON TRENDS IN GROWTH OF AGRICULTURAL PRODUCTION AND PRODUCTIVITY IN WEST BENGAL DURING 1970-71 TO 2014-15

Arjun Sarathi Das [1], Anjan Chakrabarti [2] & Sanjib Mandal [3]

RESEARCH ARTICLE

Author Details:
[1] Assistant Professor, Savitri Girls' College, West Bengal, India;
[2] Professor-Director, UGC Malaviya Mission Teacher Training Centre, North Bengal University, Darjeeling, West Bengal, India; [3] Professor, Dept. of Economics, Raiganj University; Raiganj, Uttar Dinajpur, West Bengal, India

Corresponding Author:
Anjan Chakrabarti

DOI:
https://doi.org/10.70096/tssr.260405053

Abstract

This study examines the growth pattern and stability of total foodgrain production and productivity across districts in West Bengal from 1970-71 to 2014-15. This paper calculates sub-period growth rates using a kink exponential model because it reduces discontinuity bias, provides a better basis for growth-rate comparison, reduces instability, and uses the full set of available information to estimate growth rates for each sub-period in a single step. Secondary data on production, productivity, and area are collected from various issues of the West Bengal Economic Review and the District Statistical Handbooks of West Bengal, with the limitation that no district-level data are available after 2014-15. It has been observed that there was persistence of stagnation due to negligible growth in agricultural production and productivity from 1970-71 to 1980-81; after that, there was an overwhelming turnaround from stagnation in agricultural production and productivity in West Bengal since the late eighties; and during the post-1990 period, the state and the districts' growth rate in production and productivity have declined over time. All major rice-producing districts experienced reduced growth rates in both production and productivity in the 1990s and post-1990s.

Keywords: *Foodgrain, Production, productivity, Kink Exponential Model, Instability, Stagnation, West Bengal*

Introduction

India resorted to a policy of comprehensive economic reforms in June 1991. Contemporary research argues that economic reforms initially emphasised price factors and infrastructure; however, the institutional aspect of agriculture has been grossly neglected, and as a consequence, deceleration in agricultural growth as well as decline in growth of output have been accentuated since 1991 (Chadha,2002; Majumder,2002; Bhalla, 2002; Kumar, 2002). In this regard, West Bengal has become a point of interest among researchers, especially because overwhelming agricultural growth took off after the 1980s, when it became a state in India, in terms of food grain and rice production performance.

During the reform era, production costs have increased because fertiliser subsidies were withdrawn, and price determination has been left to the market. Secondly, public investment has declined (Reddy, 2006). Diesel prices have risen continuously, making irrigation costlier. Other inputs have also become dearer. For West Bengal, doubts may be raised that the rise in agricultural productivity achieved during the eighties, if not sustained, may seriously affect agricultural income, employment, and the economy at large. A lack of alternative employment and income opportunities outside agriculture may further complicate the situation (Ghosh, 1998). It may lead to possible marginalisation of the rural workforce.

The aforementioned scenario has prompted an attempt to study trends in the growth of food grain production and productivity in West Bengal, disaggregated at the district level.

Section I

Data Methodology

The study is based on Secondary Data and Information collected from various issues of the West Bengal Economic Review and the District Statistical Handbook, with the limitation that the Government of West Bengal and other agencies did not publish district-level data after 2014-15. The empirical analysis evolved around 15 districts over time.

The total study period (1970-71 to 2014-15) is divided into four sub-periods: 1970-71 to 1980-81, 1981-82 to 1991-92, 1992-93 to 2002-03, and 2003-04 to 2014-15. The decade of 1980s to 1990s has been identified as end of the 'agricultural impasse' in West Bengal (Saggar, et al. 1989; Harris, 1993; Saha and Swaminathan, 1994; Sen and Sengupta, 1995; Rogaly et al . 1995; Raychaudhuri and Sen, 1996; Banerjee and Ghatak,1996; Gazadar and Sengupta, 1996; Sanyal, Biswas and Bardhan, 1998;

Rawal and Swaminathan, 1998; Chakraborty, 2002; Banerjee et al. 2002, Bardhan and Mukharjee 2004; Chattopadhyay,2005)after a long spate of stagnation (Saha, 1975; Islam 1978; RBI, 1984; Planning Commission, 1985; Vaidyanathan, 1987, Boyce, 1987). The period between the introduction of economic reforms in 1991 and its onward journey was divided in two sub-periods, 1991-92 to 2002-03 and 2003-04 to 2014-15, to unearth the initial euphoria or pessimism that the introduction of economic reform created in India and to capture the impact of second-generation reforms.

To calculate sub-period growth rates, we use a kink exponential model. The model also reduces discontinuity bias, provides a better basis for growth-rate comparisons, reduces instability and cyclical fluctuations, and uses the full set of available information to estimate growth rates for each sub-period in a single step.

A time series for the period t = 1,2,...n can be disaggregated at a single point k and can be expressed in a single equation as follows:

$$lnY_t = a_1D_1 + a_2D_2 + (b_1D_1 + b_2D_2)t + u_t \quad \text{(i)}$$

$D_j$is a dummy variable which takes the value 1 in the j^{th} sub-period and 0 otherwise.

Resultant discontinuity between trend lines of two sub-periods can be removed by imposing a linear restriction such that two trend lines intersect at point *k*:

$$a_1 + b_1k = a_2 + b_2k$$
$$\text{Or } a_2 = a_1 + b_1k - b_2k$$

Substituting the value of a2 into equation (i), we get the restricted form.

$$lnY_t = a_1 + b_1(D_1t + D_2k) + b_2(D_2t - D_2k) + u_t \quad \text{(ii)}$$

If a single kink is used, the kink exponential model can also be specified by re-normalising time such that t = 0 at the break point, k. Then equation (ii) can take the following form, which can be used to estimate the sub-period growth rates with a joint intercept:

$$lnY_t = a_1 + b_1D_1t + b_2D_2t + u_t \quad \text{(iii)(Boyce, 1987)}$$

Three kinks (k_1, k_2, and k_3) are introduced to measure the growth rates of four pre-specified sub-periods. The kinked exponential model can also be specified by re-normalising time such that t = 0 at the break point k_1,t = 10 at the second break point k_2 and t = 20 at the third break point k_3, then the equation can take the following form, which can be used to estimate the growth rates for four sub-periods with a joint intercept:

$$lnY_1 = a_1 + b_1D_1t + b_2D_2t + b_3D_3t + b_4D_4t + u_t \quad \text{(iv)}$$

Where,

$D_1 = 1$for 1970-1971 to 1980-1981
= 0 elsewhere.
$D_2 = 1$for 1981-1982 to 1991-1992,
= 0 elsewhere.
$D_3 = 1$for 1992-1993 to 2002-2003,
= 0 elsewhere.
$D_4 = 1$for 2003-2004 to 2014-2015
= 0 elsewhere.

Multiplying the estimated values of D1t, D2t, D3t, and D4t gives growth rates for four sub-periods, viz. 1970-71 to 1980-81, 1981-82to 1991-92, 1992-93 to 2002-2003 and 2003-2004 to 2014-15.

Section II

Dominance of Rice in Foodgrain Production in West Bengal

West Bengal and the central Gangetic Bengal is the oldest agricultural settlement in India. Except the western region (Birbhum and Bankura), which contains laterite formation, the rest of West Bengal and central Bengal is identified as a 'semi-aquatic rice plain' (Bose, 1987). In fact, two-thirds of the total geographical area falls under flat alluvial plains created by the river Ganges, making the region favourable for rice cultivation. Table 1 shows that rice production as a percentage of food grain production increased from 81.9 per cent to 89.7 per cent between 1970-71 and 2014-15. In West Bengal, rice dominates most districts in terms of its contribution to total food grain production. For most districts, rice production as a percentage of food grain varies between 80 per cent and 98.1 per cent. However, in the exceptional districts of Nadia, Murshidabad, Malda, and Darjeeling, the percentage of rice in food grain production ranges from 52 per cent to 62 per cent (Table 1).

Table 1: Production of Rice as percentage of District-wise Food grain Production

YEAR/DIST	1970-71	1980-81	1990-91	2000-01	2009-10	2014-15
Burdwan	89.6	97.5	99.5	98.7	99.7	99.4
Birbhum	75.9	92.3	96.3	89.3	90.2	91.5
Bankura	95.3	96.5	97.4	97.7	98.9	98.9
Midnapore	94.5	97.4	98.1	97.9	99.2	98.8
Howrah	89.6	94.9	99.0	98.9	99.7	99.3
Hoogly	82.6	97.1	99.7	99.1	99.8	99.8

24 Parganas	89.6	95.8	97.3	96.4	96.9	95.9
Nadia	52.9	70.4	83.7	77.1	83.0	78.1
Murshidabad	52.4	70.3	78.9	56.0	75.3	75.2
West Dinajpur	86.2	80.7	90.7	90.1	75.7	70.2
Malda	62.0	74.4	77.7	76.0	77.9	79.3
Jalpaiguri	98.1	92.2	90.7	87.0	87.4	87.6
Darjeeling	60.4	53.4	50.9	46.2	56.6	54.4
Cooch Behar	94.6	91.4	92.9	90.0	85.9	83.0
Purulia	93.3	96.0	92.3	92.0	97.3	96.1
West Bengal	81.9	90.1	92.6	90.0	91.1	89.7

Source: Compiled from the data collected from various volumes of West Bengal Economic Review, Government of West Bengal and District Statistical Handbook, Government of West Bengal.

Inter-District Comparison of Growth in Production and Productivity of Food Grain in West Bengal

Over the whole period of 1970-71 to 2014-15, the exponential growth of food grain production for West Bengal stood 3.31 percent per annum and significant at 1 percent level (Table No. 2). District wise exponential growth rates of food grain production from 1970-71 to 2014-15 more than 2.5 growth per annum achieved by Burdwan, Bankura, Midnapore, Howrah, 24 Parganas, Nadia, Murshidabad, Malda and Darjeeling and are statistically significant at 1 percent level. Hooghly, West Dinajpur and Purulia achieved 2 to 2.5 per cent growth per annum at the 1 per cent significance level. Birbhum, Jalpaiguri and Cooch Behar registered the lowest growth rate in food grain production.

While measuring changes in growth rates over different sub-periods for food grain production in the districts of West Bengal, it is seen that in the first sub-periods (1970-71 to 1980-81) the growth rates are negative for all the districts excepting 24 Parganas, Nadia and Darjeeling (Table No. 2). Absolute agricultural stagnation was found unanimously by all the researchers during this period.

A huge turnaround in food grain growth is observed after 1980-81. In the 2nd Sub-period, food grain production in West Bengal grew at an exponential rate of 4.55 per cent per annum. Among the districts, Howrah showed the most impressive growth, with food grain production rising by 7.17 per cent, the highest among districts in West Bengal. Bankura, Midnapore, Nadia, and Purulia achieved 5 to 6 per cent growth rates in food grain production. Burdwan, 24 Parganas, West Dinajpur, and Malda grew food grains by 4 to 5 per cent, while Birbhum, Hooghly, Murshidabad, Darjeeling, and Cooch Behar grew food grains by 3 to 4 per cent. Jalpaiguri district recorded the lowest growth rate, around 2 per cent.

Trend break values indicate the extent of gain or loss in growth rates for a particular sub-period compared with the previous sub-period. Trend break-I reveals that, in sub-period II, Howrah achieved the highest gain in food grain production growth over sub-period I (significant at 1%). Nadia, Bankura, Midnapore, Purulia, 24 Parganas, Malda, Burdwan, and other districts also achieved significant growth rates.

However, in sub-period III and IV, all districts failed to maintain the high growth rates in food grain production achieved in Sub-period II. It is seen that all districts, and West Bengal as a whole, saw declining growth rates in Sub-periods III and IV.

From 1970-71 to 2014-15, food grain productivity (Table 3) in West Bengal grew at an exponential rate of 2.99 per cent per annum and was statistically significant at the 1 per cent level. Districts like Burdwan, Bankura, Midnapore, Howrah, 24 Parganas, Malda, Nadia, and Darjeeling achieved growth rates above 3 per cent per annum. Nadia achieved the highest growth rate at 5 per cent per annum during the overall period. Birbhum, Hoogly, Murshidabad, West Dinajpur, and Purulia lie below the West Bengal exponential rate, i.e., below 2.99 per cent per annum. Jalpaiguri shows a negative annual growth rate, and Cooch Behar shows insignificant growth in food grain production.

Table 2: Districtwise Kinked Exponential Growth in Production of Food grain in West Bengal for (1970-71 to 20014-15)

District/ Sub-period Growth	Overall period	Sub-periods				Adj. R Squared	P-Value of DW Test	Trend break I	Trend break II	Trend break III
	1970-71 to 2014-15	1970-71 to 1980-81	1981-82 to 1991-92	1992-93 to 2002-03	2003-04 to 2014-15					
Burdwan	4.29 (6.851) ***	0.8 -0.879	4.23 (5.069)***	3.76 (10.786)***	2.48 (11.996)***	0.877	0.006	3.43	-0.47	-1.28
Birbhum	1.60 (1.892) *	-1.65 -1.317	3.87 (3.353)***	3.44 (7.139) ***	2.67 (9.333) ***	0.7503	0.016	5.52	-0.43	-0.77
Bankura	4.60 (4.342) ***	-1.09 -0.727	6.03 (4.315)***	4.38 (7.549) ***	2.46 (7.183) ***	0.6972	0.434	7.12	-1.65	-1.92
Midnapore	3.67 (5.242)***	-0.52 -0.563	5.64 (6.542)***	4.39 (12.237)***	3.23 (15.179)***	0.9021	0.166	6.16	-1.25	-1.16

Howrah	5.25 (5.892) ***	0.92 -0.713	7.17 (5.963)***	3.58 (7.231) ***	2.43 (8.269) ***	0.7723	0.19	6.25	-3.59	-1.15
Hoogly	2.37 (3.719)***	-0.09 -0.094	3.32 (3.654)***	2.85 (7.534)***	2.33 (10.329)***	0.808	0.262	3.41	-0.47	-0.52
24 Parganas	4.56 (6.758)***	1.51 -1.46	4.28 (4.539)***	3.47 (8.847) ***	2.19 (9.427)***	0.8323	0.076	2.77	-0.81	-1.28
Nadia	6.16 (9.068)***	1.43 -1.646	6.29 (7.865)***	4.38 (13.205)***	2.44 (12.476)***	0.9047	0.018	4.86	-1.91	-1.94
Murshidabad	2.70 (4.025) ***	-0.03 -0.03	3.36 (3.640)***	3.31 (8.573) ***	2.61 (11.358)***	0.8	0	3.39	-0.05	-0.7
West Dinajpur	2.21 (4.199)***	-0.4 -0.582	4.11 -6.416	3.9 -14.582	3.43 -21.518	0.9473	0.298	4.51	-0.21	-0.47
Malda	3.47 (7.271) ***	0.96 -1.362	4.28 (6.613)***	3.3 (12.267)***	2.56 (15.990)***	0.9208	0.004	3.32	-0.98	-0.74
Jalpaiguri	-0.95 (1.694) *	-1.63 -1.677	2.05 (2.317) **	1.99 (5.367) ***	2.22 (10.039)***	0.7635	0.108	3.68	-0.06	0.23
Darjeeling	4.79 (5.483) ***	2.57 (1.802)*	3.83 (2.980)***	1.62 (3.051) ***	0.56 (1.773) *	0.448	0	1.26	-2.21	-1.06
Cooch Behar	0.72 (1.438)	0.04 -0.049	3.91 (5.262)***	2.49 (8.063) ***	2.8 (15.182)***	0.8945	0.006	3.87	-1.42	0.31
Purulia	2.41 (1.867) *	-2.07 -1.037	5.3 (2.854)***	3.85 (4.993) ***	3.03 (6.614) ***	0.5802	0.896	7.37	-1.45	-0.82
West Bengal	3.31 (6.030) ***	-0.04 -0.056	4.55 (6.714)***	3.66 (12.969)***	2.67 (15.952)***	0.9145	0.024	4.59	-0.89	-0.99

Source: Calculation based on data collected from various volumes of West Bengal Economic Review, Government of West Bengal.

Notes: t-stats are shown in parentheses. *** Significant at 1%, ** Significant at 5%, * Significant at 10% 0<DW<4 validates the absence of first-order autocorrelation.

However, in the first sub-period, only four districts, Burdwan, Nadia, Malda, and Darjeeling achieved a positive and significant growth rate of productivity. For the state as a whole, the growth rate in productivity was only 0.57 per cent and insignificant. Major breakthroughs in good grain productivity were observed in the sub-period: II Bankura, Midnapore, Howrah, and Nadia experienced significant (at the 1% level) exponential growth rates of more than 5 per cent per annum. Burdwan, Birbhum, 24 Parganas, Murshidabad, West Dinajpur, and Purulia also experienced impressive productivity growth, at more than 4 per cent. Hoogly, Malda, Jalpaiguri, and Coochbehar grew by more than 3 per cent. Darjeeling grew by 2.7 per cent, the lowest among all West Bengal districts. In West Bengal, productivity growth increased from 0.57 per cent to 4.64 per cent from sub-period I to sub-period II. A significant rise in the growth of food grain was observed during this period, and an increase in productivity was thus a natural corollary.

From the trend break-I values, Bankura made the highest addition (5.92 per cent) to the growth rate in productivity from 1981-82 to 1991-92 over its previous decade of 1970-71 to 1980-81. The addition to growth in productivity for Howrah was 5.7 per cent; for Midnapore, it was 5.44 per cent; and for Jalpaiguri and Birbhum, the additions to growth were 5.16 per cent and 5.07 per cent, respectively. Malda, despite ranking near the bottom of the productivity growth table, recorded a gain of 0.44 per cent in food grain productivity growth.

In sub-period III, food grain productivity growth declined in all districts and in the state. Declining food grain productivity growth continued into sub-period IV. The decline varied between 0.11 per cent and 3.31 per cent for most districts; for Howrah and Malda, growth declined by 3.1 per cent and 0.11 per cent, respectively. For West Bengal, productivity growth declined by 1.28 per cent.

Table 3: Districtwise Kinked Exponential Growth in Productivity of Food grain in West Bengal for (1970-71 to 20014-15).

District/ Sub-period Growth	Overall period	Sub-periods				Adj. R Squared	P-value of DW Test	Trend break I	Trend break II	Trend break III
	1970-71 to 2014-15	1970-71 to 1980-81	1981-82 to 1991-92	1992-93 to 2002-03	2003-04 to 2014-15					
Burdwan	3.62 (8.589)***	1.42 (2.492)**	4.19 (6.486)***	2.8 (11.018)***	1.97 (13.310)***	0.9076	0.002	2.77	-1.39	-0.83
Birbhum	2.72 (4.501)***	-0.07 -0.095	5 (5.679)***	3.37 (9.748)***	2.53 (12.607)***	0.8672	0.03	5.07	-1.63	-0.84
Bankura	3.74 (5.559)***	-0.09 -0.121	5.83 (6.308)***	4.05 (11.145)***	2.74 (12.999)***	0.8809	0.238	5.92	-1.78	-1.31

Midnapore	3.33 (5.540)***	0.13 -0.184	5.57 (6.587)***	3.75 (11.279)***	2.77 (14.358)***	0.898	0.16	5.44	-1.82	-0.98
Howrah	3.05 (4.14)***	0.42 -0.454	6.12 (5.685)***	2.81 (6.701)***	2.16 (8.857)***	0.7765	0.682	5.7	-3.31	-0.65
Hoogly	2.36 (5.677)***	0.58 -1.032	3.53 (5.540)***	2.43 (9.662)***	1.92 (13.124)***	0.8858	0.75	2.95	-1.1	-0.51
24 Parganas	3.23 (5.744)***	1.21 -1.56	4.54 (5.158)***	3.16 (9.117)***	2.48 (12.311)***	0.8794	0.234	3.33	-1.38	-0.68
Nadia	5.00 (10.455)***	2.7 (4.563)***	5.66 (8.423)***	3.55 (13.485)***	2.55 (16.672)***	0.9448	0.004	2.96	-2.11	-1
Murshidabad	2.98 (5.960)***	0.56 -0.906	4.53 (6.382)***	3.48 (12.432)***	2.63 (16.183)***	0.9219	0.042	3.97	-1.05	-0.85
West Dinajpur	2.46 (4.75)	-0.04 -0.074	4.95 (7.139)***	4.07 (14.854)***	3.5 (21.967)***	0.9508	0.168	4.99	-0.88	-0.57
Malda	3.73 (10.66)***	3.11 (5.935)***	3.55 (6.056)***	3.44 (14.820)***	3.16 (23.370)***	0.9679	0.012	0.44	-0.11	-0.28
Jalpaiguri	-1.27 (2.497)**	-2.15 (2.899)***	3.01 (3.551)***	2.58 (7.680)***	2.82 (14.369)***	0.865	0.864	5.16	-0.43	0.24
Darjeeling	3.34 (4.378)***	1.66 -1.498	2.7 (2.164)**	2.52 (5.114)***	1.59 (5.534)***	0.663	0.002	1.04	-0.18	-0.93
Cooch Behar	-0.01 (0.042)	-0.57 -1.009	3.65 (5.632)***	2.67 (10.440)***	3.03 (20.290)***	0.9365	0.074	4.22	-0.98	0.36
Purulia	1.50 (1.752)*	-0.57 -0.478	4.01 (2.903)***	3.19 (5.853)***	2.85 (8.956)***	0.7441	0.884	4.58	-0.82	-0.34
West Bengal	2.99 (7.008)***	0.57 -1.13	4.64 (8.065)***	3.36 (14.822)***	2.59 (19.663)***	0.9453	0.104	4.07	-1.28	-0.77

Source: Calculation based on data collected from various volumes of West Bengal Economic Review, Government of West Bengal.

Notes: t-stats are shown in parentheses. *** Significant at 1%, ** Significant at 5%, * Significant at 10% 0<DW<4 validates the absence of first-order autocorrelation.

Conclusion

Therefore, the empirical results as depicted above reaffirmed three major observations on agriculture in West Bengal. Firstly, the persistence of stagnation due to negligible growth in agricultural production and productivity from 1970-71 to 1980-81; secondly, an overwhelming turnaround from stagnation in agricultural production and productivity in West Bengal since the late eighties; and thirdly, during the post-1990 period, the state and the districts' growth rates in production and productivity have declined. All major rice-producing districts experienced reduced growth in both production and productivity in the 1990s and post-1990s.

Acknowledgment: No
Author's Contribution: *Arjun Sarathi Das*: Data Collection, Literature Review, Methodology, Analysis, Drafting, Referencing; *Anjan Chakrabarti*: : Data Collection, Literature Review, Methodology, Analysis, Drafting, Referencing; *Sanjib Mandal*: : Data Collection, Literature Review, Methodology, Analysis, Drafting, Referencing
Funding: No
Declaration: The author/s has/have given consent for the publication.
Competing Interest: No

References

1. Banerjee, A., P.J. Gertler and Ghatak, M. (2002). 'Empowerment and Efficiency: Tenancy Reform in West Bengal', Journal of Political Economy, Vol. 110(2), PP. 239-280.
2. Banerjee, A. V. and Ghatak, M. (1996), 'Empowerment and Efficiency: The Economics of Tenancy Reform', Miemo, Massachusetts Institute of Technology and Harvard University.
3. Bardhan, P.K. and Mukharjee, D.(2004) 'Poverty Alleviation effort of West Bengal Panchayats', Economic and Political Weekly, Vol.39(9), February 28, pp, 965- 974.
4. Bhalla, G.S. (2002). '*Globalisation and Agricultural Liberalisation in India*', A Study Sponsored by Ministry of Agriculture, Government of India, CSRD Jawaharlal Neharu University, New delhi.
5. Bose, Sugata. (1987). Agrarian Bengal Economy, Social Structure and Politics, 1919-1947, Cambridge: Cambridge University Press.
6. Boyce, James K. (1987), *Agrarian Impasse in Bengal: Institutional Constraints to Technological Change*, Oxford University Press, New Delhi

7. Chadha G.K. (2002). *'Indian Agriculture in the New Millennium: Human Response to Technological Change',* Presidential Address to 62nd Annual Conference of Indian Society of Agricultural Economics, Indian agricultural Research Institute, New Delhi. December 19, 2021.
8. Chakraborti, Anil (2002), *Beneficiaries of Land Reforms: The West Bengal Scenario*, State Institute of Panchayats and Rural Development, Spandan, Kolkata.
9. Chattopadhyay, Apurba Kumar (2005), 'Distributive Impact of Agricultural Growth in Rural West Bengal', Economic and Political Weekly, Vol.40(53), December 31, pp, 5601- 5608.
10. Gazdar, H. and S, Sengupta (1996), 'Agrarian Politics and Rural Development in West Bengal' in J. Dreze and A. K. Sen (eds.), *Indian Development, selected Regional Perspectives*, New Delhi, Oxford University Press.
11. Ghosh, Madhusudan (1998), *'Agricultural Development, Agrarian Structure and Rural Poverty in West Bengal'*, *Economic and Political Weekly*, Vol.33, No.47-48, November 21: 2987-2995.
12. Government of India (1985), Seventh Five-Year Plan, 1985-1990, Vol. II, Planning Commission, New Delhi.
13. Harris, John (1993), 'What is happening in Rural West Bengal? Agrarian Reform, Growth and Distribution', *Economic and Political Weekly*, Vol.28, No.24, June 12: 1237-1247.
14. Islam, M. M. (1993). 'What is happening in Rural West Bengal? Agrarian Reforms, Growth and Distribution', Economic and Political Weekly, Vol. 28 (24), June 12,pp. 1237-1247.
15. Kumar, P. (2002). '*Agriculture Performance and Productivity'*, In Acharya, S.S. and D.P. Chaudhuri(ed), Indian Agricultural policy at the crossroads, Jaipur: Rawat Publication.
16. Majumder, N.A. (2002). '*Rural Development: New Perception'*, Economic and Political Weekly, Vol. 37 (39), September 28, pp, 3983-3987.
17. Rawal,Vikash and Swaminathan., M.(1998), 'Changing Trajectories: Agricultural Growth in West Bengal, 1950 to 1996', *Economic and Political Weekly*, Vol.33, No. 40, October 3-6: 2595-2602.
18. Raychoudhuri, A. and Sen, A. K. (1996), 'Agricultural Reforms and Productivity: Some Important Lessons to be learnt from West Bengal's Operation Barga', In Raychoaudhuri, A. and Sarkar, D(ed.). Economy of West Bengal Problems and Prospect, New Delhi, Allied Publishers Ltd.
19. Reddy, D. Narasimha. (2006). '*Economic Reforms, Agrarian Crisis and Rural Distess',* 4th Annual Prof. B JanardhanRaoMemforial Lecture, Prof. B. JanardhanRao Memorial Foundation, Warangal, Telengana.
20. Reserve Bank of India (RBI) (1984), *Agricultural Productivity in India: Report of Committee on Agricultural Productivity in Eastern India*, Vol. I & II, Bombay.
21. Rogaly, Ben., Barbara Harris-White and Bose Sugata (1995), '*Sonar Bangla*? Agricultural Growth and Agrarian Change in West Bengal and Bangladesh' *Economic and PoliticalWeekly*, Vol.30(29), March 04: 1862-1864.
22. Saggar, Mridul and V SundarRaghavan (1989), 'Planning for Agricultural Transformation' *Reserve Bank of India Occasional Papers,* Vol.10.No.4, December.
23. Saha, A. and M. Swaminathan (1994), 'Agricultural Growth in West Bengal in 1980's: Disaggregation by Districts and Crops', *Economic and Political Weekly*, Vol. 29, No.13, pp, A2-A11, March 26.
24. Sanyal, M.K., P.K. Biswas and S. Bardhan (1998), 'Institutional Change and Output Growth in West Bengal Agriculture: End of Impasse', *Economic and Political Weekly*, Vol. 33, No. 47-48, November 21: pp, 2979-2986.
25. Sen, Abhijit and SenguptaRanja (1995), 'The Recent Growth in Agricultural Output in Eastern India, with Special Reference to the Case of West Bengal', paper presented at a workshop on Agricultural Growth and agrarian Structure in Contemporary West Bengal and Bangladesh, Calcutta.
26. Shah, C.H. (1975). 'Farm Production', A Survey of Research in Economics, Volume III, Agriculture Part-I, A Project Sponsored by Indian Council of Social Science Research, New Delhi: Allied Publisher.
27. Vaidyanathan, A. (1987). 'Agricultural Development in Eastern India', *Economic and Political Weekly*, Vol.22, No.52, December, 26: 2259-2263.

Publisher's Note
The Social Science Review A Multidisciplinary Journal remains neutral with regard to jurisdictional claims in published data, map and institutional affiliations.

©The Author(s) 2026. Open Access.
This article is licensed under a Creative Commons Attribution 4.0 International License, which permits use, sharing, adaptation, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if changes were made. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit http://creativecommons.org/licenses/by/4.0/