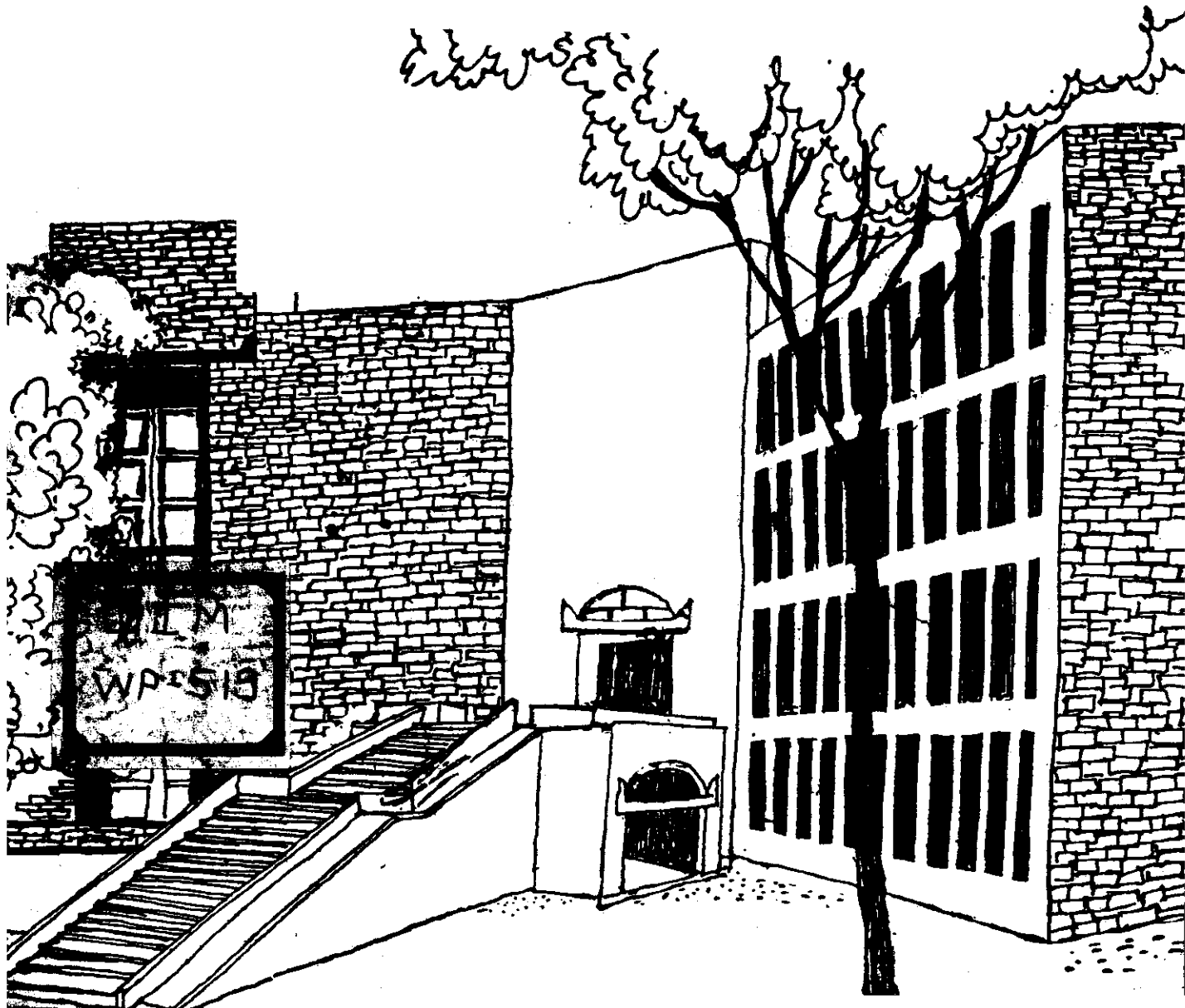




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# Working Paper



ANALYSIS OF RICE PRODUCTION AND  
PRODUCTIVITY IN EASTERN INDIA

By

D.K. Desai

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INDIAN INSTITUTE OF MANAGEMENT  
AHMEDABAD-380015  
INDIA

### ABSTRACT

The problems of low productivity of rice in Eastern India is currently being discussed among the policy makers, academicians and technologists. This paper attempts to analyse the data of rice production, area and productivity of Eastern India and individual states for a period of 1971-72 to 1981-82. The low productivity is the result of the slow adoption of high yielding varieties which points to the fact that the varieties evolved are not suitable for the area or proper rice technology is not evolved. The analysis of district data indicates that there are few districts with positive growth rates and a large number of districts with negative growth rates of productivity. A comparative study of these two groups of districts will reveal factors which govern low productivity in the region. Because of the analysis of the district data, it was possible to identify the districts in the two groups. It is suggested that a research project be undertaken in the selected districts of the two groups to identify factors governing the low productivity and to suggest measures to policy makers, development agencies and research agencies to improve productivity and enhance production.

ANALYSIS OF RICE PRODUCTION AND PRODUCTIVITY  
IN EASTERN INDIA

Introduction

In the present study, we have considered the following states in Eastern India: 1) Assam, 2) Bihar, 3) Orissa, 4) West Bengal and 5) North Eastern States\*. These states account for 45.74% of total area under rice but they shared only 38.69% of the total rice production in India. This is because of low productivity of rice in Eastern India. The average yield per hectare of rice (1972-1981) in Eastern India was 1010 kgs. compared to the all-India level of 1200 kgs. As it is, the all-India average yield per hectare of rice was much lower than most of the rice-growing countries in the world. The concern for low productivity in Eastern India has drawn special attention of policy makers, economists, technologists and academicians. This paper attempts to analyse the data of rice production, area and yield in Eastern India as a whole and by states for the period 1971-72 to 1981-82. An attempt is also made to analyse the district data to investigate the reasons for low productivity and making suggestions for improvement.

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\* North-eastern States include Tripura, Nagaland, Mizoram, Arunachal Pradesh, Manipur and Meghalaya.

### Low Productivity and Stability

Agricultural production is beset with uncertainties particularly weather uncertainty. Hence the coefficient of variation for a time series data tends to be very high. However, rice production in India has remained stable over the period from 1971-72 to 1981-82 at a low level of productivity. The average production during the period was 46.44 million tonnes with a coefficient of variation of only 12 per cent. Rice production in Eastern India was more stable than all-India production with an average of 17.94 million tonnes and the coefficient of variation of only 9.4 per cent (Table 1). In Eastern India, the maximum variation in rice production was observed in Orissa (C.V. 15.4%) and the minimum in Assam (C.V. 8.4%).

The variation in rice area was much smaller than that in production both at all-India and Eastern India levels. The maximum variation in area was observed in Assam and minimum in Orissa in Eastern India. The yield per hectare was stabilised at a very low level in Eastern India and individual states. Except in West Bengal and N.E. States the average yield per hectare had not crossed even one-tonne mark. The coefficient of variation for yield varied from 6.5% in Assam to 14.8% in Orissa.

### Growth Rates of Area, Production and Yield

The low-level stable production in Eastern India has witnessed very slow growth. The whole area has lagged behind the all-India

Table 1

Area, Production and Yield of Rice in Eastern India  
(1971-72 to 1981-82)

Area in million ha.  
 Production in million tonnes  
 Yield per ha. in kg.

States	Area		Production		Yield	
	average	C.V.	average	C.	average	C.V.
Assam	2.22	7.4	2.14	8.4	973	6.5
Bihar	5.29	4.4	4.63	12.4	876	11.1
Orissa	4.41	3.8	3.96	15.4	896	14.8
W. Bengal	5.11	5.8	6.37	9.9	1247	8.8
N.E. States	.76	6.5	.87	13.3	1142	8.9
E. India	17.77	3.2	17.97	9.4	1010	7.7
All-India	38.85	3.3	46.44	12.0	1200	9.2

pattern achieving only less than 1% growth rate (0.87%) in production during the period of 1971-72 to 1981-82 (Table 2). It is much below all-India growth rate of 2.76% and cannot stand anywhere near Punjab and Haryana which had achieved growth rates of more than 10%<sup>1</sup>.

In Eastern India, surprisingly the highest growth rate in rice production was achieved by N.E. States, followed by Assam. Two patterns of growth rates of production are observed in Eastern India; one with more than 1.0% in Assam and N.E. States and the other with less than 1.0% in Bihar, Orissa and West-Bengal. The achievement of more than 1.0% growth rate in production in Assam and N.E. States was more due to area expansion rather than improvement in yield.

The growth rate of area in Assam and N.E. States was 1.59% and 1.15% respectively. The growth rate of area in Bihar and West Bengal was negligible (.64% and .40% respectively) and in Orissa it was negative (-.84%). The expansion of rice area in Assam has something to do with the influx of outside population.

The growth rate of productivity which is the key element varied from -.47% in Assam to 2.12% in N.E. States. How much of the growth

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1. D.K. Desai, Madalsa Gandhi, "Analysis of Rice Production and Productivity in India and Rice Research Management", Indian Institute of Management, Ahmedabad, February 1983 (Mimeo), p.39.

Table 2  
Growth Rates<sup>@</sup> of Area, Production and Yield  
of Rice in Eastern India  
(1971-72 to 1981-82)

States	Area	Production	Yield
Assam	1.59*	1.20** <sup>a</sup>	-.47 <sup>a</sup>
Bihar	.64 <sup>a</sup>	.89 <sup>a</sup>	.25 <sup>a</sup>
Orissa	-.84	.87 <sup>a</sup>	1.71 <sup>a</sup>
West Bengal	.40 <sup>a</sup>	.40 <sup>a</sup>	.80 <sup>a</sup>
N.E. States	1.15** <sup>a</sup>	3.27*	2.12
E. India	.12 <sup>a</sup>	.87 <sup>a</sup>	.75 <sup>a</sup>
All-India	.89	2.76*	1.87*

\* Significant at 5% level

\*\* Significant at 1% level

@ The growth rates were obtained by fitting the function:

$$\text{Log } Y = a+bt \quad \text{where } Y = \begin{array}{l} \text{Production in tonnes, in has, or} \\ \text{t = year} \quad \quad \quad \text{yield in kgs.} \end{array}$$

a)  $R^2$  values are lower than 0.3



rates of productivity and production in N.E. States was due to improvement in statistics, is not known. The major concern is the low growth rates of productivity in Bihar and West Bengal (.25% and .80% respectively). Although Orissa had achieved 1.7% growth rate in productivity which is much better than its growth rate of first six years (1971-73 to 1977-78)<sup>2</sup>, the average yield per hectare had not crossed 1100 kgs. by 1981-82. This is achieved by reduction in area and concentration on somewhat better area under rice.

#### Low Growth Rate and Low Productivity

Unfortunately the low growth rate was associated with low productivity during the period under study. Not a single state had achieved the highest average yield per hectare beyond 1450 kgs. in any year, whereas the lowest average yield had reached the level of about 700 kgs (Table 3).

#### Reasons for Low Growth Rates

It is important to investigate reasons for the low growth rate of productivity, in Eastern India. We compared the growth rates of productivity of rice in Eastern Indian states with other states in India for the period of 14 years (1963-65 to 1977-78)\* (Table 4).

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2. Ibid p.41

\* 1963-65 denote triennium of 1963, 1964 and 1965.  
1977-78 denote biennium of 1977 and 1978.

Table 3

Highest and Lowest Yield per Hectare of Rice  
in Eastern India  
(1971-72 to 1981-82)

(Average yield per ha. in kgs.)

States	Highest	Lowest	Mean	Growth Rate %
Assam	1109	882	973	-0.47
Bihar	1023	704	876	0.25
Orissa	1091	709	896	1.71
W. Bengal	1442	1120	1247	0.80
N.E. State	1246	862	1142	2.12
E. India	1159	900	1010	0.75
All-India	1340	1060	1200	1.87

Table 4

Growth Rates of Rice Productivity in Different  
States (1963-65 to 1977-78)

<u>Traditional Rice growing states</u>	<u>Growth rate (1963-65 to 1977-78) 14 years</u>
<u>Southern India</u>	
Andhra Pradesh	0.65
Tamilnadu	2.60
Kerala	0.52
<u>Western India</u>	
Gujarat	3.10
Maharashtra	2.42
<u>Northern India</u>	
Uttar Pradesh	2.07
<u>Central India</u>	
Madhya Pradesh	0.63
<u>Eastern India</u>	
Assam	0.21
Bihar	0.36
Orissa	-0.75
West Bengal	0.75

Contd.....

Non-Traditional Rice  
Growth States

Northern India

Punjab	5.60
Haryana	5.13

Southern India

Karnataka	1.83
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All-India	1.20
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Source: D.K. Desai & Madalsa Gandhi, Op.cit. p.41

All the important states of Eastern India had lower growth rates of productivity than all-non-traditional rice growing states in India and traditional rice growing states of Western India and Tamilnadu in Southern India. The important traditional rice growing states which had equally bad growth rates of productivity as Eastern India were Andhra Pradesh and Kerala, but they had higher levels of productivity.<sup>3</sup> One of the reasons for the low growth rates of productivity may be the slow rate of adoption of high yielding varieties. The rate of area coverage of high yielding varieties of rice was much lower in Eastern India than at all-India level for the period 1971-72 to 1980-81. The area coverage of HYV rice in Eastern India lagged far behind because of slow adoption of HYV in the individual states (Table 5).

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3. Ibid. p.46

Table 5  
Area Under High Yielding Varieties of Rice  
All-India Vs. Eastern India

Year	('000 hectares)			
	All-India		Eastern India	
	Area under HYV	% to total area under Rice	Area under HYV	% to total area under Rice
1971-72	7397	20.2	1624	9.3
1972-73	8171	21.5	1867	10.9
1973-74	10000	26.3	2122	11.9
1974-75	11000	29.0	2293	12.8
1975-76	12443	31.3	2781	15.1
1976-77	13337	34.7	3438	19.2
1977-78	16122	40.3	4075	22.3
1978-79	16882	40.2	4557	26.1
1979-80	15991	41.0	4260	25.7
1980-81	18495	46.5	5086	28.4

Source: Fertiliser Statistics, 1973-74, 1976-77 and 1982-83.

The area coverage of HYV rice increased from 9.3% to 28.4% in Eastern India whereas it increased from 20.2% to 46.5% at all-India level during the period 1971-72 to 1980-81. Except for West Bengal and Tripura, the area coverage of HYV rice in individual states remained at a low level (Appendix-1). This indicates, perhaps, non-suitability of the high yielding varieties in Eastern India, and poses a major problem to agricultural scientists.

Some people think that the slow adoption of HYV rice in Eastern India was due to the problem of land distribution. They emphasize that unless structural changes in land distribution take place, the technological improvements have very little chance to succeed. The experience of partial success in rice production in other states of India does not support this assumption. The data on land distribution in rice growing districts of various states from farm management studies do not give firm conclusion that land distribution in Eastern India was more inequitable than other states (Table 6).

Table 6

Average Size of Farm in Rice Growing Districts  
and Gini Coefficients

State	District	Classification of dist. in ABC category.	Average size of farm in sample (acres)	Gini coefficient
1	2	3	4	5
<u>Eastern India</u>				
Assam	Nowgong (1968-69)	A	7.96	0.277
				contd...

1	2	3	4	5
Bihar	Shahbad (1960-61 -1962-63)	A	10.74	0.434
Orissa	Cuttack (1969-70)	A	4.34	0.285
W. Bengal	Hoogly (1956-57)	A	2.99	0.374
	(1970-71)	A	2.37	0.427
<u>Other States</u>				
Gujarat	Surat-Bulsar (1968-69)	A	4.34	0.386
Andhra Pradesh	Cuddapah (1969-70)	B	14.33	0.409
Tamilnadu	Thanjavur (1968-69)	A	5.19	0.383
	Thanjavur (1969-70)	A	7.56	0.408
	Coimbatore (1970-71/ 72-73)	A	14.38	0.420
U.P.	Muzafarnagar (1967-68)	B	16.13	0.340

Source: D.K. Desai and Madalsa Gandhi Op.cit pp.123-126

### Analysis of Growth Rates by Districts

The analysis of growth rates of area, production and yield of rice at all-India level and by states presented a gloomy picture but when the analysis was carried out at the disaggregate level of districts, there were good signs of hopes of improving productivity<sup>4</sup>. A similar attempt was made to study the phenomenon at the district level in Eastern India.

### ABC Classification of Districts

A concept of marketing management was used in classifying rice growing districts in India on the basis of their shares in the total rice production. Table 7 gives ABC classification of districts in India for seven years (1971-72 to 1977-78). It would be seen that one fourth of the total number of rice growing districts in the country have nearly two-thirds of the total area and production of rice. These districts are classified as A-districts. They have more than 200,000 tonnes of production of rice per year in each district. Nearly 35% of the number of rice growing districts covered less than 5% of the total area and production of rice in 1977-78. These districts are classified as C-districts and have less than 50,000 tonnes of rice production per year in each district. The remaining districts are classified as B-districts and they have rice production between 50,000 and 200,000 tonnes per year in each district.

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4. Ibid. p.176



Table 7

Distribution of Districts in India According to ABC Classification of Rice Production from 1971 to 1977\*

14

Category/Year	1971		1972		1973		1974		1975		1976		1977	
	No. of Dist.	Production % Area %	No. of Dist.	Production % Area %	No. of Dist.	Production % Area %	No. of Dist.	Production % Area %	No. of Dist.	Production % Area %	No. of Dist.	Production % Area %	No. of Dist.	Production % Area %
A														
> 200000 tonnes/Dist.	73	68.9 65.3	64	65.8 59.0	77	66.6 63.1	69	63.4 57.4	85	68.5 66.1	76	63.5 59.4	85	67.2 64
B														
> 50000 200000 tonnes/Dist	102	26.6 28.1	107	29.8 32.6	123	29.8 31.6	116	31.7 33.7	123	28.1 29.2	126	32.0 35.1	133	29.8 32.3
C														
< 50000 tonnes/Dist.	138	4.5 6.5	149	4.5 8.4	134	3.6 5.3	150	4.8 9.0	130	3.4 4.8	136	4.5 5.6	120	2.9 3.7
Total	313	100 100 (41237) (37200)	320	100 100 (39193) (36571)	334	100 100 (43980) (37931)	335	100 100 (40197) (37935)	338	100 100 (49349) (39702)	338	100 100 (42603) (38431)	338	100 100 (51506) (40015)

Figures in parentheses show the absolute figures of production and area in thousand tonnes and hectares respectively.

\*The number of districts have increased over the period because rice growing was undertaken in the later years.

### ABC districts in Eastern India

The ABC classification of districts in Eastern India in 1977-78 showed that A and B districts formed 71.4% and 26.8% of the total number of rice growing districts in Eastern India respectively.\* This means that Eastern India had a predominance of A-districts. West Bengal had the highest number of A districts followed by Bihar (Table 8).

### Growth Rates of Production and Productivity by Districts

The analysis of growth rates<sup>®</sup> of rice production and productivity was carried out for individual A and B districts in Eastern India for a period of 14 years (1963-65 to 1977-78). For this analysis the N.E. States were excluded as the data for the total period were not available. Out of 50 districts, 11 had growth rates of production of more than 2 per cent. In the region of low growth rates and low productivity, these moderate-growth-districts provide a ray of hope (Table 9). Out of 11 districts, 4 were from Assam, 1 from Bihar and 6 from West Bengal. As indicated earlier, the growth in production in Assam was more due to area expansion than improvement in productivity.

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\* The individual states of N.E. region are treated as districts for this classification.

® The growth rates were obtained by finding annual compound growth rates using the average of triennium (1963, 1964, and 1965) as base and the average of biennium (1977 and 1978) as the end data.

Table 8ABC Classification of Rice Growing districts  
in Eastern India (1977-78)

States	Number of Districts			Total
	A	B	C	
Assam	6	2	0	8
Bihar	12	4	0	16
Orissa	7	4	0	11
W. Bengal	13	2	0	15
N.E. States	2	3	1	6
Total E. India	38	15	1	56

Table 9

Distribution of districts into ABC categories according to growth rates of rice production in Eastern India for 14-year period (1963-65 to 1977-78)

Classification of growth rates	Assam			Bihar			Orissa			W. Bengal			Eastern India		
	A	B	Total	A	B	Total	A	B	Total	A	B	Total	A	B	Total
-2.01 & less				2		2	1	1	2				3	1	4
-2.01 - 1.00							1		1				1	-	1
-1.01 - 0.00	-			1	1	2	4	3	7				5	4	9
0.01 - 1.00	2		2	5	2	7	1		1				8	2	10
1.01 - 2.00	2		2	3	1	4				8	1	9	13	2	15
2.01 - 3.00	2		2							3	1	4	5	1	6
3.01 - 4.00		1	1							1		1	1	1	2
4.01 - 5.00				1		1				1		1	2		2
5.01 -10.00		1	1											1	1
Total	6	2	8	12	4	16	7	4	11	13	2	15	38	12	50

In contrast to 11 districts, there were 14 districts which had a negative growth rate of production. Out of these 14 districts, 4 belonged to Bihar and 10 to Orissa. The comparison of these two groups of districts will throw light on the reasons of low productivity in eastern India. The identification of the two groups of districts was as follows:

	<u>Group I</u>	<u>Group II</u>
State	Districts having more than 2% growth rate in rice production	Districts having negative growth rates in rice production
Assam	<ol style="list-style-type: none"> <li>1. Goalpara</li> <li>2. Nowgong</li> <li>3. Lakhimpur + Dibrugarh</li> <li>4. Mikir Hills + N.C. Hills</li> </ol>	
Bihar	<ol style="list-style-type: none"> <li>1. Sitamarhi + Muzzaffarpur + Vaishali</li> </ol>	<ol style="list-style-type: none"> <li>1. Purnea + Kathihar</li> <li>2. Ranchi</li> <li>3. E. Champaran + W. Champaran</li> <li>4. Chanbad + Hazaribag</li> </ol>
Orissa		<ol style="list-style-type: none"> <li>1. Bolangir</li> <li>2. Dhankanal</li> <li>3. Gunjam</li> <li>4. Keonjhar</li> <li>5. Mayurbanj</li> <li>6. Phulbani</li> <li>7. Sambalpur</li> <li>8. Sundargarh</li> <li>9. Cuttack + Puri</li> <li>10. Kalahandi + Koraput</li> </ol>
W. Bengal	<ol style="list-style-type: none"> <li>1. Nadia</li> <li>2. Murshidabad</li> <li>3. Burdwan</li> <li>4. Hooghly</li> <li>5. Malda</li> <li>6. Darjeeling</li> </ol>	

Not a single district with more than 2% growth rate and as many as 10 districts with negative growth rates in rice production in Orissa should cause a great concern to state policy makers and research workers.

The growth rates of productivity are more important than those of production as ultimately the improvement of productivity would solve the problem of inadequate production. Table 10 gives the distribution of districts according to the growth rates of productivity. The positive growth rates of productivity were much lower than those of production. There were 13 districts with more than 1.00% growth rate of productivity. Out of 13 districts 7 belonged to West-Bengal, 5 to Bihar and 1 to Assam. Again we find that not a single district in Orissa had a positive growth rate of more than 1.00%. The most distressing aspect was that there were as many as 24 districts with negative growth rates of productivity in the four states of Eastern India. Out of 24 districts, 10 belonged to Orissa, 7 to Bihar, 5 to West Bengal and 2 to Assam. The fact that about 50 per cent of the total number of districts should have negative growth rates of productivity clearly indicates a failure on the technology front. The identification of districts with more than 1.0 per cent positive growth rate and those with negative growth rates of productivity will lead to proper investigation of reasons for low productivity. These districts were identified as group I and II as follows:

Table 10

Distribution of districts into ABC categories according to  
growth rates of rice productivity in Eastern India  
for 14-year-period  
(1963-65 to 1977-78 )

Classification of growth rates	Assam			Bihar			Orissa			W. Bengal			Eastern India		
	A	B	To- tal	A	B	To- tal	A	B	To- tal	A	B	To- tal	A	B	To- tal
-2.01 & less							1	1	2				1	1	2
-2.01 - 1.01					1	1	1		1	1	1	2	2	2	4
-1.01 - 0.00	2		2	5	1	6	4	3	7	3		3	14	4	18
0.01 - 1.00	4	1	5	4		4	1		1	2	1	3	11	2	13
1.01 - 2.00		1	1	3	2	5				6		6	9	3	12
2.01 - 3.00															
3.01 - 4.00										1		1	1		1
4.01 - 5.00															
5.01 - 10.00															
<b>Total</b>	<b>6</b>	<b>2</b>	<b>8</b>	<b>12</b>	<b>4</b>	<b>16</b>	<b>7</b>	<b>4</b>	<b>11</b>	<b>13</b>	<b>2</b>	<b>15</b>	<b>38</b>	<b>12</b>	<b>50</b>

	<u>Group I</u>	<u>Group II</u>
	<u>Growth rate more than 1.00 per cent</u>	<u>Negative growth rates</u>
Aesam	1. Mikir Hill + N.C. Hills	1. Kamrup 2. Darrang
Bihar	1. Shahbad = Bhajpur + Rohtas 2. Sitamarhi + Muzaffarpur + Vaishali 3. Gaya + Naudah + Aurangabad 4. Bhagalpur 5. Palamau	1. Purnea + Kathihar 2. Ranchi 3. E. Champaran + W. Champaran 4. Monghyr + Saharsa + Begusarai 5. Dhanbad + Hozaibagh 6. Darbhanga + Madubani + Samastipur 7. Saran + Gopalgunj + Siwan
Orissa		1. Gunjam 2. Mayurbhanj 3. Bolongir 4. Kaluhandi + Koruput 5. Sambalpur 6. Cuttack + Puri 7. Dhenkanal 8. Keonjhar 9. Phulbari 10. Sundargarh
W. Bengal	1. Nadia 2. Murshidabad 3. Burdwan 4. Birbhum 5. Malda 6. East + West Midnapore 7. Hooghly	1. Jalpaiguri 2. Bankura 3. W. Dinajpur 4. Cooch-behar 5. Darjeeling
	<hr/> 13	<hr/> 24

This analysis points to special problems of low productivity in Orissa. The geographical distributions of Group I and II districts in other states indicate specific patterns which would divulge locational factors affecting productivity. The comparative study



of the two groups of districts would help policy makers and agricultural scientists identifying factors leading to low productivity.

#### Research Proposal

This study has helped in identification of a research project to investigate into the reasons for low productivity of rice in Eastern India by identifying the districts with somewhat better growth rates of productivity and negative growth rates of productivity. A comparative study of the selected districts from the two groups: one with moderate positive growth rates and two with negative growth rates of productivity would throw light on the factors affecting productivity.

Two types of studies are suggested: One involving secondary data with the district as a unit and the other involving primary data with a farmer as a unit. The study based on secondary data will be of two types: 1) using cross-sectional data and 2) using time series data. The study based on primary data would be conducted in some of the selected districts of the two groups. Appropriate number of farmers should be selected with a proper sampling design.

The objectives of the studies would be:

1. to identify (a) agro-climate, (b) socio-economic, c) institutional and d) political factors affecting rice productivity.
2. To suggest policy measures for rice research and production enhancement

3. to suggest measures to remove constraints inhibiting growth of rice productivity
4. to investigate whether the growth of rice productivity in A-districts would lead to higher agricultural growth.

### Conclusion

The low productivity of rice in Eastern India is an established fact. More than 45% of the total area under rice in the country is in Eastern India. Such a large area has lagged behind in productivity enhancement. The slow rate of adoption of high yielding varieties indicates that perhaps a proper rice technology or technologies are not yet evolved for various parts of Eastern India. This is a challenge to agricultural scientists. Even at the low level of productivity some districts have shown moderate growth rates whereas a large number of districts have shown negative growth rates of productivity. It is suggested that a research project be undertaken making a comparative study of the two groups of districts, one with moderate growth rates and two with negative growth rates to identify the factors governing low productivity and then suggest measures to improve productivity. This would help research scientists and development workers to take appropriate measures for improvement of rice productivity and production enhancement.

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## APPENDIX

Area under HYV Rice and its share to total Area under Rice in Eastern India

States	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79	1979-80	1980-81
	Area '000 hectare									
Assam	200 (10.1)	274 (13.0)	280 (13.4)	321 (15.6)	328 (14.6)	431 (18.8)	554 (24.6)	576 (25.7)	376 (17.6)	577 (25.4)
Bihar	440 (8.0)	452 (9.5)	640 (12.1)	696 (13.3)	768 (14.6)	998 (18.8)	1300 (23.2)	1365 (25.3)	1060 (20.7)	1400 (25.5)
Orissa	253 (5.6)	400 (8.9)	358 (7.6)	313 (7.0)	483 (10.3)	557 (12.7)	647 (14.7)	867 (19.8)	991 (24.1)	1100 (26.2)
W. Bengal	704 (14.1)	690 (13.6)	764 (14.8)	871 (16.0)	1053 (19.1)	1290 (24.8)	1393 (25.8)	1551 (33.5)	1650 (36.6)	1800 (34.8)
Manipur	3 (2.2)	7 (4.7)	12 (7.1)	13 (7.4)	35 (19.7)	40 (22.3)	45 (25.4)	48 (26.8)	40 (25.7)	51 (27.0)
Meghalaya	2 (2.0)	3 (3.1)	3.5 (3.4)	5 (5.0)	7 (6.7)	9 (8.4)	14 (13.1)	16 (15.0)	16 (15.6)	NA
Nagaland	0.4 (0.6)	0.5 (0.8)	1 (1.6)	1.6 (2.5)	3 (4.5)	4 (6.0)	6 (8.6)	7 (9.6)	7 (9.6)	11 (10.8)
Tripura	22 (7.7)	40 (14.2)	63 (21.1)	73 (24.4)	104 (34.6)	109 (35.7)	116 (38.0)	127 (42.5)	120 (47.1)	147 (51.1)
Arunachal Pradesh Mizoram	) N D T A V A I L A B L E									
Eastern India	1624 (9.3)	1867 (10.9)	2122 (11.9)	2293 (12.8)	2781 (15.1)	3438 (19.2)	4075 (22.3)	4557 (26.1)	4260 (25.7)	5086 (28.4)
All India	7397 (20.2)	8171 (21.5)	10,000 (26.3)	11,000 (29.0)	12443 (31.3)	13337 (34.71)	16122 (40.3)	16882 (40.2)	15901 (41.0)	18495 (46.5)

Figures in bracket are percentage to total area under rice.

Source: Fertiliser Statistics, 1973-74, 1976-77 and 1982-83