

IMPACT OF TILPARA BARRAGE ON PRODUCTIVITY OF BORO PADDY IN AJAY MAYURAKSHI INTER RIVERINE TRACT OF BIRBHUM DISTRICT, WEST BENGAL

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Abstract: Tilpara barrage at suri is constructed over Mayurakshi river that has its source on Trikut in Jharkhand. The present study reveals the “Impact of Tilpara Barrage on productivity of Boro paddy in Ajay- Mayurakshi inter riverine tract of Birbhum District”. Crop productivity indicates total amount of production of different crops per unit of area(acre). On the basis of which the level of agricultural development can be marked. Hypothetically higher the productivity value of crops higher will be agricultural development. The production and productivity effects of an area can be evaluated by considering the growth rate of output, area, and yield of various crops. Here to analyze the impact of Tilpara barrage on productivity of Ajay- Mayurakshi inter riverine tract of Birbhum district, data have been collected from field survey of the above said study area.

Keywords: Productivity, canal irrigated area, Boro paddy

Introduction:

Boropaddy is cultivated in waterlogged, low-lying or medium lands with irrigation during November to May. This type of paddy has been cultivated traditionally in river basin deltas. This practice is spreading even to those non-traditional areas where irrigation is available. Boropaddy system takes advantage of residual moisture after the harvest of kharif paddy. Such areas with high moisture retention capacity are low-lying ditches where water is stored or gets accumulated, areas adjoining canals and roads, Chaur-lands/Tal-lands, etc. With the increase in irrigation facilities, boro crop is now being taken in areas outside its traditional boundaries and a new cropping system is emerging. Boro is a winter season, photo-insensitive, transplanted rice cultivated on supplemental irrigation. This gives the farmers a chance to grow a rabi season crop which normally they could not grow. Tilpara barrage at suri is constructed over Mayurakshi river that has its source on Trikut in Jharkhand. It provides canal irrigation. Agricultural productivity is a function of interplay between physical and cultural variables and its manifest itself through per acre productivity. This paper shows how Tilpara barrage affects the productivity of Boro paddy crop in this study area. The canal irrigation is provided by Tilpara barrage which increases the production and productivity of different crops. Tilpara barrage directly and indirectly influences to increase productivity of the winter and pre-kharif crop Boro paddy because during non Kharif season canal rarely provides irrigation water. Agricultural activities play a vital role in socioeconomic condition in Ajay-Mayurakshi inter riverine tract of Birbhum district. The aim of this study is to investigate the contribution of this barrage to increase the productivity of pre-kharif Boro paddy crop on the basis of which the level of agricultural development can be measured.

Literature survey:

Compediqbal studied impact on canal irrigation on productivity of Boro paddy. According to him canal irrigation supports to use HYV seeds. As a result productivity of Boro paddy has increased in a large scale.

Dhawan (1993) observed the impact of Sharda canal irrigation on agriculture in U.P. specifically the crop productivity. According to him it has increased the productivity and generated new scope for employment.

U.P. Singh (2002) studied cultivation of Boropaddy in eastern India. He found canal irrigation has positive impact on cultivation of Boro paddy. Due to very little amount of Natural rainfall, canal irrigation is the only reliable source for this cultivation.

Objectives of the study:

Present study possess following objectives-

- (1) To examine positive impact of irrigation from Tilpara barrage on productivity of Boro paddy crop, cultivated during pre-kharif season.
- (2) To evaluate the negative impact of irrigation from Tilpara barrage on the productivity of Boro paddy crop cultivated during pre-kharif season.

Data base:

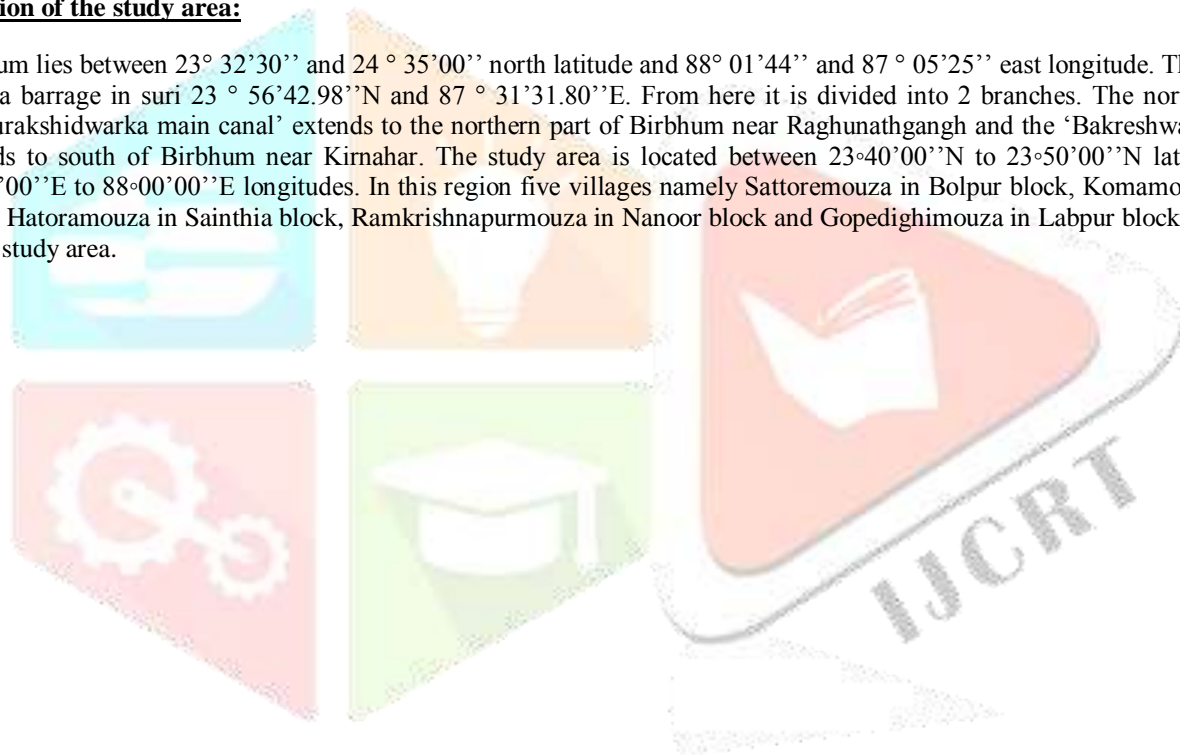
The data have been collected from two sources i.e. secondary and Primary .The secondary data on the physical aspects of the study area have been collected from west Bengal district gazetteers, Birbhum written by DurgadasMazumdar (Dec.1975). The data on irrigation, drainage, drought problem, rainfall, temperature, soil etc. have been collected from the records of the respective offices e.g. Mayurakshi canal circle, principal agricultural office of Suri, from district census handbook, Birbhum 1981. Primary data obtained from field survey are related to the distribution of the ownership of holding, productivity of Boropaddy per acre, canal irrigation facilities, use of fertilizers, area under high yielding variety etc. have been collected from field investigation.

Methodology:

The step of methodology is concerned with the collection of data and information about the Tilpara canal system from Mayurakshi canal circle (Birbhum), has been collected. Agricultural farms (in acre) have been selected from five villages in Ajay-Mayurakshi inter riverine tract of Birbhum district and land owners of 250 farms have been interviewed and data regarding their productivity per acre, agricultural development, socio-economic condition have been collected. Later these data have processed. Percentage of Canal irrigated area wise productivity (in quintal) of Boro paddy has been arranged. For data processing coefficient of correlation statistical technique has been computed and microsoft excel software have been used for simple tabulation and calculation. Percentage of canal irrigated area wise agricultural productivity has been shown by bar graph. Arc GIS 10 software has been used for making choropleth maps.

Location of the study area:

Birbhum lies between $23^{\circ} 32'30''$ and $24^{\circ} 35'00''$ north latitude and $88^{\circ} 01'44''$ and $87^{\circ} 05'25''$ east longitude. The location of Tilpara barrage in suri $23^{\circ} 56'42.98''N$ and $87^{\circ} 31'31.80''E$. From here it is divided into 2 branches. The north branch i.e. 'Mayurakshidwarka main canal' extends to the northern part of Birbhum near Raghunathganh and the 'Bakreshwarmain canal' extends to south of Birbhum near Kirnaha. The study area is located between $23^{\circ}40'00''N$ to $23^{\circ}50'00''N$ latitudes to and $87^{\circ}20'00''E$ to $88^{\circ}00'00''E$ longitudes. In this region five villages namely Sattoremouza in Bolpur block, Komamouza in Suri II block, Hatoramouza in Sainthia block, Ramkrishnapurmuza in Nanoor block and Gopedighimouza in Labpur block represent the entire study area.



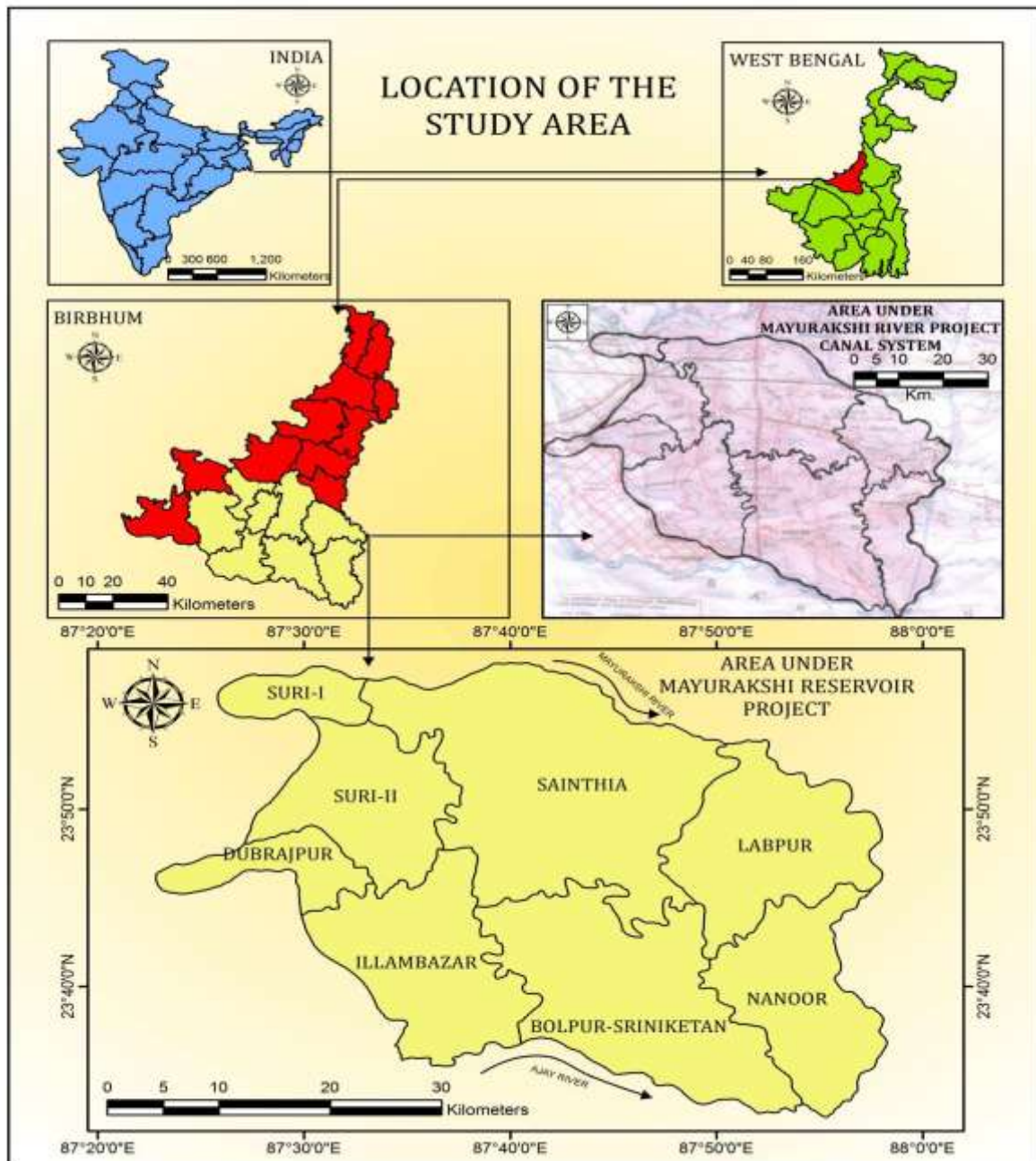


Figure-1

Source- India map, West Bengal map and Birbhum map compiled by raster from google.com and vectorised by GIS software. Birbhum map of 'area under Mayurakshi reservoir project' was provided by Mayurakshi Canal Circle, Suri. Location of the study area between Ajay-Mayurakshi inter riverine tract of Birbhum district map was compiled by Author with the help of political map of Birbhum district.

Productivity of Boro paddy:

cultivation of pre-kharif crop Boro paddy in the pre-kharif season has expanded rapidly after the introduction of HYV seeds and the spread of irrigation facilities from Tilpara barrage. The productivity of Boro paddy has expanded rapidly in the last thirty years in Ajay-Mayurakshi inter-riverine tract of Birbhum district. Boro paddy crop is high water demanding pre kharif crop. It requires controlled irrigation because the crop is extremely moisture sensitive. Further, Boro paddy is a very water intensive crop. It is mainly cultivated where assured submershal irrigation is available. Submershal obtain water from ground water resource which is enriched by canal irrigation. Boro paddy is not cultivated in Ramkrishnapur village due to paucity of irrigation. However, out of the rest of the four villages in Sattore, Koma and Hitora the farms with larger spatial extent of canal irrigated area produce smaller amount of Boro paddy crop indicating meager impact of Tilpara barrage. They cultivate those farms by submershal. Its electricity consumption is very high. Small farmers want to borrow submershal facilities from big farmers to cultivate Boro paddy. For this purpose they depend on money lenders. So the small farmers do not want to continue this for total period of Boro paddy crop cultivation. As a result their amount of productivity becomes low. On the other hand in Gopedighi village the farms with larger amount of canal irrigated area produce substantial amount of Boro paddy crop. This indicates clear

cut impact of Tilpara barrage on productivity of Boro paddy. Overall, it appears from the data that at least from the mid nineteen eighties, cultivation of Boro paddy has emerged as the most important agricultural activity after cultivation of rain-fed paddy in this study area. Clearly, this change has been driven by the relatively higher profitability from cultivation of 'Boro' paddy. These observations can be indicated in details by means of following table (Table number-3) and diagrams (Diagram number-11 to Diagram number-14).

Table-1: Distribution of productivity (q./acre) of Boro paddy crop in respect of canal irrigated area.

SATTORE		KOMA		HATORA		RAMKRISHNAPUR		GOPEDIGHI	
% of canal irrigated area	Productivity (q./acre)	% of canal irrigated area	Productivity (q./acre)	% of canal irrigated area	Productivity (q./acre)	Canal irrigated area (in acre)	Productivity (q./acre)	Canal irrigated area (in acre)	Productivity (q./acre)
55.00-61.66	8.30	60.00-73.33	7.10	60.00-66.66	8.00	0.8-4.6	-	0.8-4.73	-
61.66-68.32	5.70	73.33-86.66	6.43	66.66-73.33	4.10	4.6-8.4	-	4.73-8.66	7.20
68.32-75	4.80	86.66-100	1.75	73.3-100	6.00	8.4-12	-	8.66-12.66	8.60

Source: Table composed by the Author

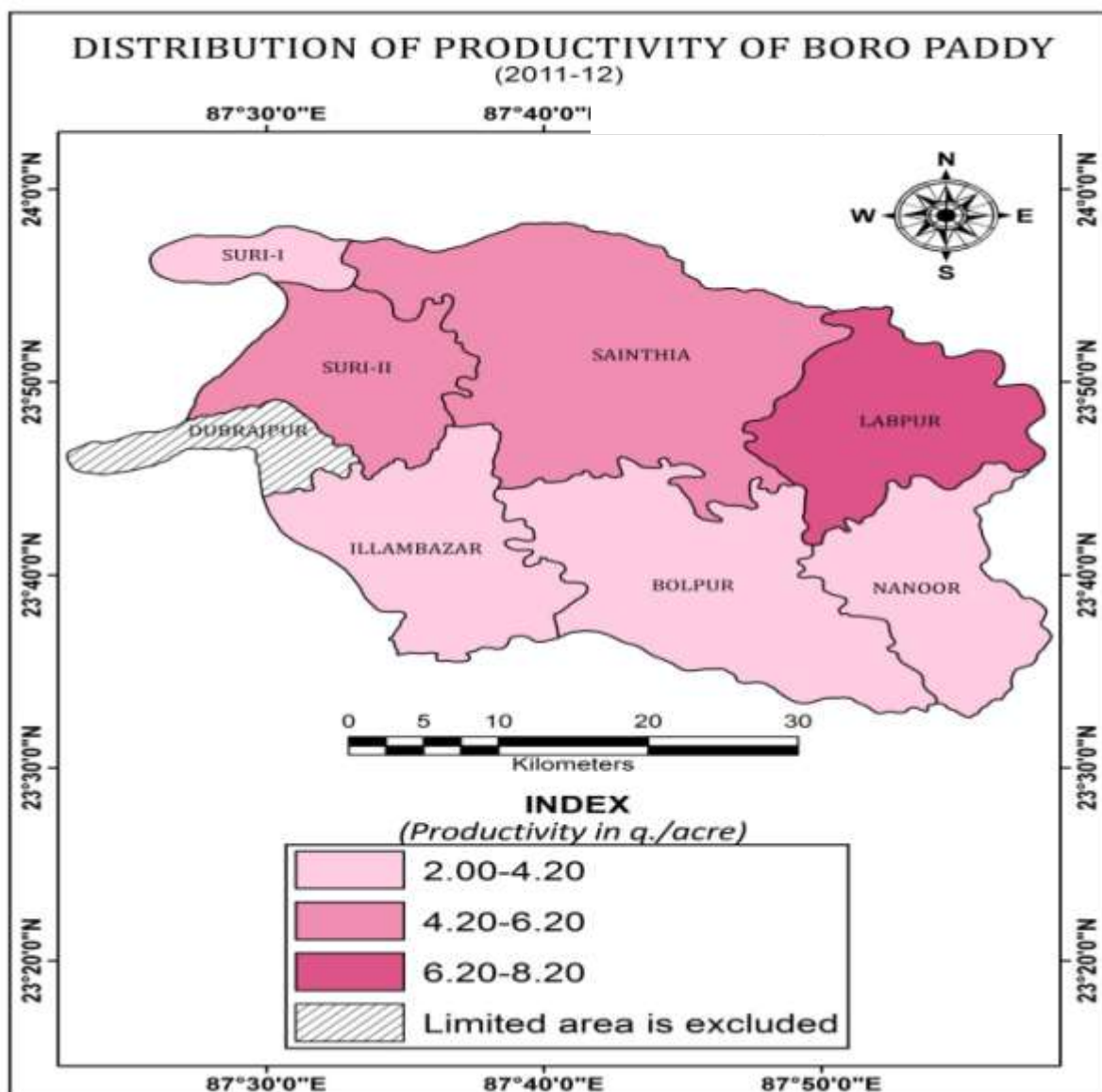


Figure-2

Source: Map prepared from the data obtained from field survey

The region under study has different types of soil that varies from sticky sandy clay, loamy, sandy, loam and sticky clay soils. The sticky sandy clay soil has high water retentive capacity and best suited to grow Boro paddy crop. Silty loam soil is found along the river side which is loose and friable and yellowish in color. It is a rich soil and well suited for Boro paddy crop.

Table: 2, Correlation between Canal Irrigated area and Productivity of Boro paddy crop

Variable X' (Canal irrigated area)	Variable 'Y' Productivity (quintal/acre)	'r' values (correlation)	Computed 't' value	Tabulated 't' value		Significant / Insignificant	Hypothesis accepted	
				5%	1%		Null	Alternative
Sattore (In %)	Boro paddy	0.31	2.26	2.01	2.68	Insignificant	Accepted	
Koma(In %)	Boro paddy	-0.40	-3.02	2.01	2.68	Significant		Accepted
Hatora (In %)	Boro paddy	-0.46	-0.36	2.01	2.68	Insignificant	Accepted	
Ramkrishnapur (in acre)	Boro paddy	0.55	4.55	2.01	2.68	Significant		Accepted
Gopedighi (in acre)	Boro paddy	0.71	7.00	2.01	2.68	Significant		Accepted

Source: Compiled by the author

The correlation coefficients computed between the percentages of canal irrigated areas and productivities of Boro paddy crop are positive in Sattore, Ramkrishnapur and Gopedighi villages. The values are 0.31, 0.55 and 0.71 respectively. It means that the farms with large proportion of canal irrigated area produce large amount of crops in cultivation of Boro paddy crop. 'r' values are negative in Koma and Hatora. The values are -0.40 and -0.46 respectively.

Hence the null hypothesis which is put forward as —the percentage of canal irrigated area and productivity of Boro paddy crop is independent— is rejected and alternative hypothesis is accepted at 1% level of significance in Koma, Ramkrishnapur and Gopedighi villages as a consequence of their significant correlation. On the other hand this null hypothesis is accepted in case of Sattore and Hatora villages because of insignificant correlation.

Since the correlation is significant in above three villages, therefore, the above relationship holds good for all the farms of these three villages namely Koma, Ramkrishnapur and Gopedighi. On the otherhand, the correlation being insignificant in Sattore and Hatora villages, the above relationship is valid only for fifty farms of these three villages (Table -2).

Negative impact of Tilpara barrage on productivity of Boro paddy:

The Summer Rice, which is popularly known as Boro, involves high cost for irrigation. During 2000-01 and 2005-06 the productivity of Boro paddy was declined due to negative effect of irrigation. Birbhum revealed a marked slowdown in growth rate of productivity in respect of Boro paddy. Summer rice will experience enhanced ET, needing larger, more frequent irrigation. Usually it is difficult for the canal to fulfill the demand in dry season. Gravelly laterite soil is also found in some pockets of this region. This is a poor soil that has low fertility and productivity value and is hard. It is reddish, loose and friable soil. It decreases the productivity of Boro paddy.

Thus this barrage reveals both positive and negative impacts on the productivity of Boro paddy in Ajay-Mayurakshi inter riverine tract of Birbhum district.

Conclusion:

The above discussion reveals the fact that the impact of canal irrigation, direct or indirect, which is considerably found in most of the sample villages for the production and productivity of paddy crops. In Hatora village the impact of canal irrigation is observed both directly and indirectly. Considerable extent of positive impact can be observed in Ramkrishnapur. In Gopedighi village, the farms with larger size of canal irrigated area have produced larger amount of Boro paddy crop. Set against this, the inverse impact of Tilpara barrage through the provision of canal irrigation is discernible for certain villages. e.g. the negative impact is found in Sattore village regarding Boro paddy. The negative impact is found in Koma village in respect of Boro paddy crops. The entire region has thus obtained direct and indirect primary and secondary benefits and sometimes negative impacts in the regional economy.



Plate-1
Mayurakshi canal system



Plate-2
Tilpara barrage



Plate-3
Canal irrigation through Borro paddy field



Plate-4

Boro paddy cultivation

References:

Annual Action Plan, 1988-89 (Block plan), Birbhum District Rural Development agency, Suri, West Bengal, pp 27-103

CompedIqbal, 1979, "High yielding varieties of seeds and their impact on agricultural development in dynamics of agricultural development in India". Ed. By Ali Mohammad, concept publishing company, New Delhi, pp 70-79.

Dhawan, B. D., 1994, Irrigation in India's Agricultural Development: Productivity, Stability, Equity, Second Edition edn., Sage Publications Pvt. Ltd., New Delhi.

Singh, U.P. 2002, Boro rice in eastern India. Rice-wheat consortium regional technical coordination committee meeting. 10-14 February 2002. Rice-wheat consortium for the Indo-gangetic plain, New Delhi.