

INPUT AVAILABILITY AND MODERN AGRICULTURE IN BURDWAN DISTRICT, WEST BENGAL

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ABSTRACT : The failure of Green Revolution to increase agricultural productivity uniformly has raised serious criticisms. The available institutional structure in India has proved inadequate and unsuitable for a uniform success of this strategy. The crucial aspect of the success lies in its tremendous investment requirement for a series of inputs, each equally indispensable. The inputs, primarily imported, are beyond the reach of small and middle farmers and yet Green Revolution remains an important remedy to overcome the problem of low agricultural productivity in India. The present paper studies the application of this strategy in the regional setting of Burdwan District, the so-called granary of West Bengal.

During the sixties when mechanised agriculture was viewed as ultimate solution to the problem of low productivity in India, West Bengal, with an undulated topography, small land-holdings, uncertain and ununiform rainfall, large number of poor and small farmers, was not the primary choice for the programme. Punjab, where the refugees from Pakistan had earlier consolidated the small holdings into joint ones and then Haryana, a land of rich and big farmers were the initial choice with wheat as their major crop.

The selection of these areas reveals the input oriented nature of this revolution which promised to bring about a miraculous rise in crop productivity within a short period. The core of new technology consists of a special variety of seeds (commonly called a High Yielding Variety or HYV) with optimum inputs under improved practices. The seeds, supposed to be adaptive to any environment, however, are not as adaptable as the naturally select-

ed ones and hence present problems of disease susceptibilities. They do not bear fruit unless heavy doses of fertiliser and optimum irrigation are applied. Therefore, for deriving full benefit, the seeds must receive plenty of nourishment and chemical protection; if a single one of the required elements is lacking, HYVs can sometimes produce less grain than the traditional varieties (George, 1976). It is more suitable a programme for large landowners par excellence and cannot be otherwise; they are already better equipped, have almost exclusive access to input and output markets and are the major, if not almost exclusive, recipients of agricultural credit (Feder, 1975).

This input-based revolution, actually a gift to South East Asia from the IRRI (International Rice Research Institute founded by Rockefeller and Ford Foundation in 1962), however, became an eventual strategy for increased production in West Bengal also. During the late sixties, Burdwan with some

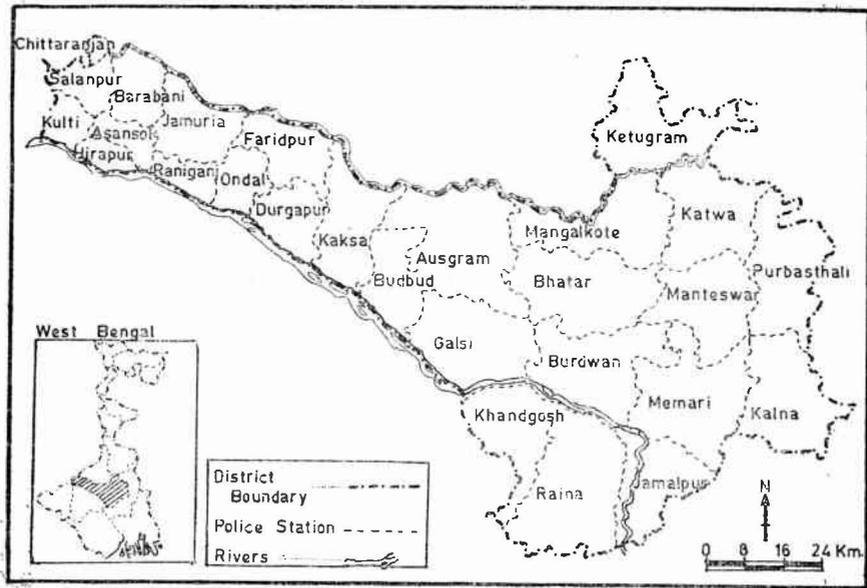


Fig. 1

richest farming families of the state was first selected for its application. With a vast fertile plain in the east, it has been a principal source of food supply for state from early times. The western part is marked by undulations with drier climate (Fig. 1).

It alone has one of the highest population densities in India. Overwhelming majority of the people (83 per cent) live in rural areas. Although a major rice producing district, Burdwan has only little above 2.5 acres for every adult employed directly in agriculture. There are ample reasons as to why the majority of agricultural families in Burdwan were unable to appreciate the benefit of the new revolution (Frankel, 1971).

The IADP (Intensive Agricultural District Programme) at the outset made the above physical variation more pronounced by its initial choice of only fertile plains of the east for cultivation of HYV. The revolution further accentuated socio-economic disparity among the eastern farmers as very few of them were ultimately able to afford the high cost of production involved in the new strategy.

A detailed discussion follows concerning the spatio-economic suitability of the strategy in Burdwan district.

Physiography

Topography in the western part of the district is undulated, steep and gradually descending from the centre towards the east into a plain. As uneven topography acts as a natural obstacle to uniform agricultural activity throughout the district, there is a marked difference in the percentage of cultivated area between the west and east. 70-80 per cent of the cultivated area lies in the eastern plains (Fig. 2) with only 30 metre elevation. The courses of the rivers are also according to the lie of the land i. e. from west to east.

There is a general impression that application of modernisation methods has been extensive throughout Burdwan district since late sixties. But, in fact, it has been tried only in few eastern police stations endowed with nature's gifts. There are a number of serious obstacles to wide-spread cultivation of HYV in Burdwan district. e. g. during the Aman season most of the areas without water management facili-

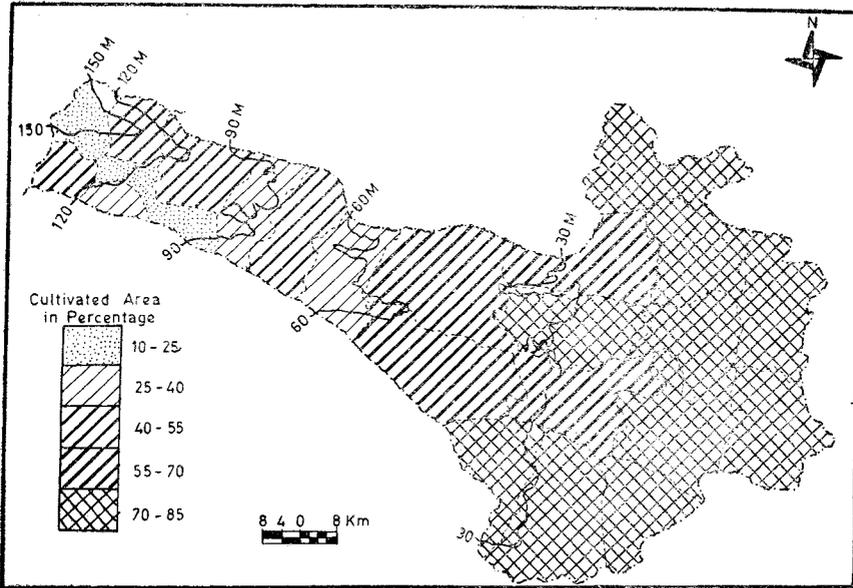


Fig. 2

ties lying between medium and low elevation are submerged posing a threat to the dwarf varieties. Only 300,000 acres escape this. The Aman season is also clouded throughout which is a deterrent to the growth of HYV seeds. Dry Boro season which seems to be more suitable is again discarded due to scarce irrigation facilities.*

Irrigation

HYV seeds require regulated water supply and a good drainage condition. The timing for irrigation in the district is a vexed problem due to the vagaries of climate. But all types of irrigation depend on the strength of the monsoon.

Highest intensity of irrigation (about 70 per cent) is present in the eastern police stations namely Galsi, Memari, Khandagosh, Burdwan and Bhatar; 50-70 per cent intensity is found in Ausgram, Jamalpur, Raina Mongolkote, Ketugram, Monteswar; 30-35 per cent intensity is experienced by Kalna and Katwa. Other police stations with very low intensity are mostly located in the western part of the district (Fig. 3). Correlation coefficient of the irrigated area and

crop productivity is quite high (0.85) testifying to the importance of a well co-ordinated interdisciplinary water management system in the success of HYV (Dasgupta, 1977). But the regression line drawn on the same data shows a considerably fluctuating relationship between the two. Both have increased during the last 20 years, but production has not always kept pace with irrigation. It again underlines the importance of other inputs in the overall success of HYV.

In Burdwan district, police stations of Salanpur, Kulti, Hirapur, Ranigunj, Faridpur, Asansol and Andal are fully dependent on rainfall. These are all the western police stations which receive a meagre amount of rainfall as compared to the eastern police stations. In Barabani, Faridpur and Purbasthali crops are cultivated partly by well and tank irrigation. Most of the eastern police stations are watered by canals. But the canals are also mostly dependent on monsoons. D. V. C. Supplies water to about 202,500 hectares and the small More Project supplies to another 12150 hectares. Crop production is uniformly high in those police

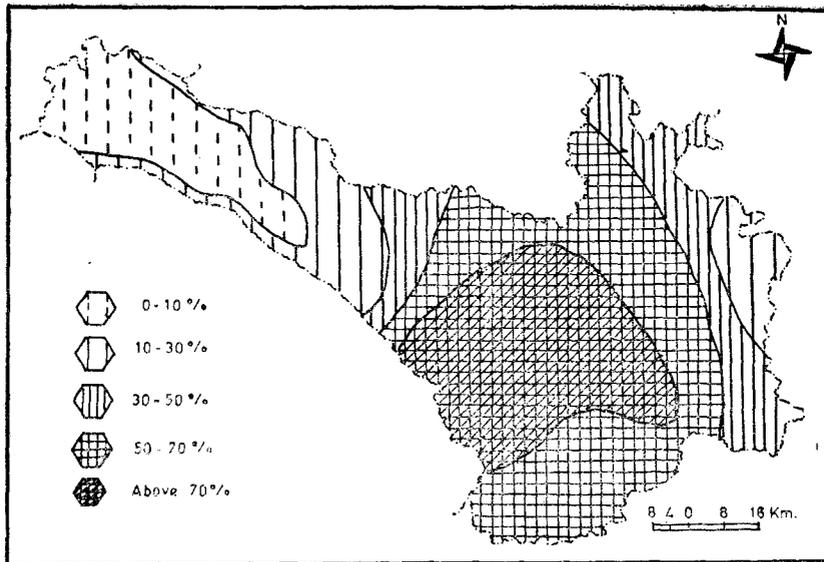


Fig. 3

tations where timely canal irrigation is associated with other inputs. No attempt has been made to irrigate the barren west.

Empirical observations in the D. V. C Canal area reveal the nature of a peculiar practice, very much common among rich landowners who are at the same time village moneylenders. Sometimes they intentionally allow lands to remain fallow throughout the season by underutilising canal water. The agricultural labourers thus denied work are compelled to approach them for loan. The latter provide them with loans to earn more profit than what the cultivation could have fetched them.

Seeds

The core task of Green Revolution was the introduction of special variety of seeds to produce an extraordinarily high yield. Paddy seeds like Jaya, Ratna, Pankaj, IR 8, IR 20 together with other inputs have been successfully used by some rich owner-cultivators in Burdwan district.

Fertiliser

Consumption of fertiliser was low in the district during the period 1961-69. Later with increased consumption, the yield also increased. In 1976-77 due to inadequate rainfall

yields declined (Fig. 4). Correlation coefficient between consumption of fertiliser and rice yield is quite high (0.76) showing a medium-positive relationship.

An important factor is as the size of farm increases, a tendency to decrease the application of fertiliser per acre becomes evident (Malone, 1965). In large modernised farms all inputs are capital intensive and the intensity of productivity increases with further increase in size of the holdings. In Burdwan where 97.3 per cent of the farms are less than 6 hectares, many cultivators who grow HYV seeds have to apply large amount of fertiliser, sometimes even more than the traditional farmers.

But in general, fertiliser in Burdwan district has a restricted access to a very few police stations where assured irrigation reaps a good harvest. Commonly used fertilisers are Sufala, Urea, Ammonium sulphate etc.

Pesticides

HYV seeds are prone to pests and diseases during the late stage of their growth. In West Bengal monsoon is accompanied by humidity and lack of sun leading to a much higher incidence of plant diseases. General use of pesticide in Burdwan

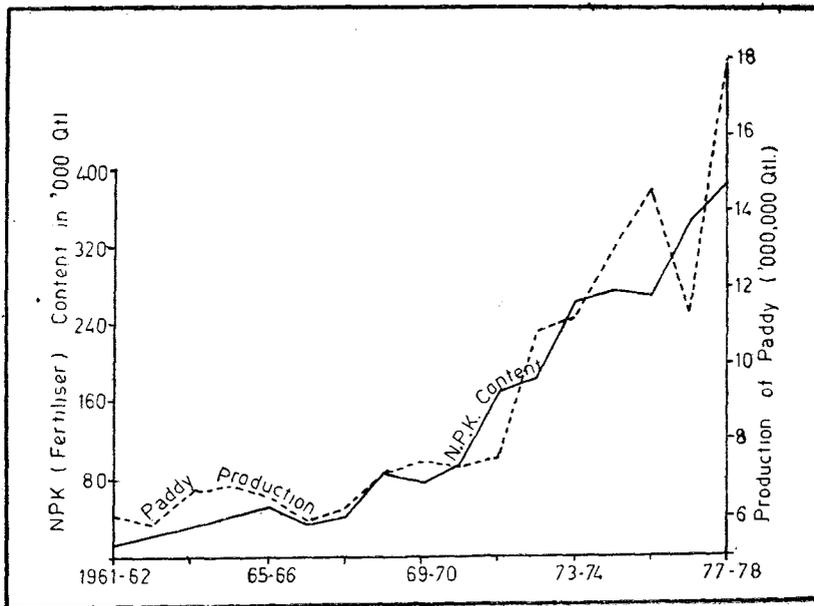


Fig. 4

district is meagre due to its high price. There was a sincere attempt by a Calcutta firm to supply pesticide at a low price. But as the demand was far in excess of supply, the benefit to the farmers was marginal.

In addition to pests and insects, weed control poses another serious problem to the farmers. Increased application of fertilizer and modern practices like use of tractor encourage growth of weeds.

Modernization Practices

Using tractors in vast plain lands is certainly profitable, but in a district like Burdwan where land is mostly fragmented and undulated they cannot be used uniformly. Tractor technology proves to be less expensive for large farmers only (Parthasarathi, 1974) who account for a small portion of the agricultural community of Burdwan.

Agricultural Credit and Availability of inputs

As the new technology is capital intensive, credit facility is a must for small and medium farmers of the district who constitute the majority. However, credit does not reach them either in time or in required amount

thereby leading to low productivity. This strongly calls for a judicious distribution of inputs over time and space as outputs suffer with non-availability of inputs.

While summing up the effects of Green Revolution in Burdwan district, it is relevant to quote Hanumanth Rao "an increase in regional disparities in the wake of technological change has been a common feature of agricultural growth in many parts of the world. These disparities arise partly from the character of the technological and partly from the regional difference in factor endowments, physical and institutional infrastructure and entrepreneurship" (Rao Hanumantha, 1975). In this way, the real sharing of the benefits of new technology is restricted to 10 per cent or at most 20 per cent of the farmers of India (Ladjensky, 1969).

In Burdwan production of crops has increased in those eastern areas where rich farmers cultivate HYV with optimum inputs. The majority of poor farmers of the east though having favourable physiographical conditions, are unable to reap the fullest benefit due to lack of input facility. Besides

this socio-economic inequity, the spatial gap between the eastern and western farmers needs careful investigation. Because the agricultural development programme was basically evolved for well-watered areas, it almost completely disregarded the problems and potential of dry areas (Jodha, 1972). Thus, so long the unirrigated farms do not have a comparable innovation to raise its yield, the absolute difference in income between irrigated and unirrigated farms will

persist (Sen, 1972).

Technologically developing economy should not only mean rendering assistance to a handful of select farmers to increase their agricultural productivity, but it should also be broadbased, comprehensive and innovative enough to devise alternate economic measures for the agriculturally handicapped areas where geographic space and local resources await optimal utilisation.

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