

TECHNOLOGICAL TRANSFORMATION OF AGRICULTURE

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M P Bezbaruah

One major limitation of the Green Revolution has been its slow diffusion from the regions of its initial success to the rest of the country. For instance, its High Yielding Variety seeds based new technology is yet to make substantial impact on the predominantly rice growing agriculture of Eastern India. In the state of Assam in this belt, a half of the State Domestic Product still originates in the primary sector. About 70% of the gross cropped area is under rice. Official statistics claim impressive growth of area under High Yielding Rice Varieties. But that growth does not seem to have led to any significant appreciation of productivity of the crop. With the fertilizer consumption rate only at one-tenth of national average, the yield rates of principal crops in the state continue to dip farther below the all-India rates.

Against this bleak overall picture, the field studies of the author reveal signs of progress and positive developments at the grass-root level. About 80% of sample farmers, irrespective of farm size and tenurial status, have adopted the High Yielding Varieties. In most cases though adoption has so far been partial and not fully effective. The unsuitability of the new varieties to low-lying and flood-prone areas partly explain the inability of the farmers to use them more extensively in the rainy Kharif season. But for the rest, effective utilization of the yield potentials of the new technology is constrained by the lack of adequate infrastructural support. With a farming community receptive to innovations, a technological transformation of agriculture in Assam can be turned into reality by suitable policy measures to fill the lacunae in rural infrastructure.

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A Study from Assam

M. P. Bezbaruah



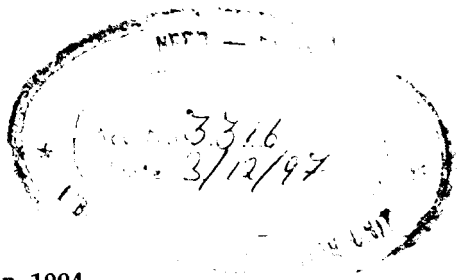
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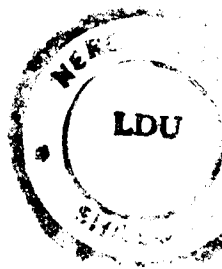
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ONE

INTRODUCTION

In mid 1960s, agriculture in India was in a condition of great difficulty. During the 1950s and the early 1960s, agricultural growth in India was sustained mainly by expansion of area under cultivation. But by mid 1960s the scope for increasing the area under cultivation has become fairly limited. The growth of yield rate of crops was already very weak and there was not much scope for increasing agricultural productivity in the country without some major technological breakthrough in the farm sector. To cap up all this, the country experienced disastrous droughts in the two successive years of 1965 and 1966. The result was a severe food shortage and near famine condition in many parts of the country. The grave situation led to deep concern and serious rethinking among the policy makers, as a consequence of which strategic changes were made in the agricultural policy of the country. The new agricultural strategy aimed at increasing agricultural productivity in the country by replacing the old method of farming by a modern and more efficient technique of cultivation.

The new technology which to replace the old mode of cultivation, was based on some newly developed crop varieties known as the high yielding varieties. As their name suggests, these varieties were found to be giving yields much higher than those of traditional local varieties, provided of course, their use was supported adequately by complementary inputs such as chemical fertilizers and pesticides, and controlled watering. The new strategy did succeed in boosting productivity and sustaining production growth in agriculture of the country in the years that followed. But the impact of the new technology on Indian agriculture was far

from general and widespread. The initial success of the strategy was strictly confined to a belt in north-western India comprised of the States of Punjab and Haryana and the western part of the State of Uttar Pradesh. Crop-wise, dramatic increase in production and productivity was achieved only in case of wheat. Apart from this highly localised spurt in wheat production in the late 1960s, the process of diffusion of the new technology to the other parts of the country and to the production of other crops like rice (which is the most important food crop in India) has progressed at a very slow pace. In this context, it may be of interest to examine whether the new technology has been able to make any significant contribution towards agricultural development in the State of Assam, in the North Eastern Region of the country. The present study aspires to assess the performance of agriculture in Assam in the context of the technological transformation of agriculture at the national level.

Objectives and Scope of the Study

The study has been taken up with four basic objectives in mind. These are:

- (a) analysis of the rate and pattern of agricultural growth in the State in the last few decades,
- (b) assessment of the present state of agriculture in Assam, with particular emphasis on the progress made so far in transfer of the new technology,
- (c) identification of factors significantly affecting adoption and use of the new technology by the farmers in the State, and also of the constraints responsible for the slow spread of the new farm technology in the State, and
- (d) prescription of policy measures for expediting the process of transfer of technology in the agricultural sector of the State.

The rate and pattern of agricultural growth in Assam has been analysed for the period from 1960-61 to 1984-85. The choice of the period has been prompted by the constraint of availability of reliable and comparable statistics for the present state of Assam rather than by sound economic logic. The data for this analysis have been secured from the Directorate of Economics and Statis-

tics of the Government of Assam.

An assessment of the state of agriculture in Assam has been made on the basis of comparison of its present state of affairs with the overall picture of the country as a whole. The data for this comparison have been partly compiled from various State and Central government publications and partly collected directly from a number of State government departments.

For identification of the factors significantly affecting farmers' adoption and utilisation of the new technology, a field survey was carried out during the winter of 1987-88. The findings of the field study have been combined with the available statistics and reports about the present state of agriculture and related activities in the State for identification of the constraints on diffusion of the new farm technology in Assam.

Suggestion of policy measures for expediting the process of technological transformation of agriculture in Assam has been made primarily on the basis of the findings of the present study keeping in view of course the reports of some other relevant studies.

Our hypothesis in this study is that it is the inadequacies and weaknesses of agricultural infrastructure in the State which have been restricting the process of technological transformation of agriculture in Assam.

Layout of the Study

The present volume is comprised altogether of twelve chapters including the present Introductory one.

Chapters two and three provide the backdrop to initiate the main arguments of the study in the subsequent chapters. Chapter two presents a theoretical discussion on the role of technological progress in the agricultural growth of a developing economy. Chapter three describes the characteristics of the new farm technology package and the impact of the new technology on Indian agriculture.

The core of the study begins with chapter four on agriculture in Assam. Here a brief description of the structure of agriculture in Assam is followed by an analysis of the trends in agricultural

growth in the State. Moreover, a comparative study of the state of agriculture in Assam, and that of the agriculture sector at the national level, and an assessment of the progress towards a technological transformation of agriculture in the State, have also been presented in this chapter.

Chapter five is the product of a survey of available literature on the subject of adoption of the new agricultural technology. The findings of the some of these works, which were found relevant in the context of the present study, have been summarised in this chapter.

The six chapters from chapter six to chapter eleven are based on the field survey carried out as a part of the study. Chapter six outlines the methodology followed in the field survey. The findings of the survey and their implications have been presented and analysed in the subsequent five chapters.

The concluding chapter (i.e. chapter twelve) is basically comprised of two parts. The first part is a summary of the main findings and conclusions of the study. The second part presents the suggestion of policy measures emerging from the study.

A major problem of agriculture in Assam is the instability in crop production resulting from floods. The possibility of reducing the flood induced instabilities in agricultural production in the State with the help of the new agricultural technology has been briefly discussed in the appendix.