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## **Book Reviews**

*Economic Liberalisation and Indian Agriculture: A District-level Study*, G.S. Bhalla and Gurmail Singh, Sage Publications India Pvt. Ltd., New Delhi, Pp.xxx + 360. Rs. 795.00.

The advent of high-yielding varieties (HYV) seed-fertiliser-water technology during the mid-sixties has totally changed the landscape of Indian agriculture. It has not only increased the production and productivity of various crops but also increased the cropping intensity and helped to change the cropping pattern from low value to high value crops. While benefiting the farmers directly, the new agricultural technology has also helped to reduce the rural poverty and increase the wage rates for agricultural labourers on a sustainable basis. However, it is often argued that the benefits of this new technology have not spread uniformly across various regions and states in the country. Is this true? A large number of studies have analysed the impact of new agricultural technology on various parameters over the years. But not many studies have analysed the regional dimension of it using more disaggregated district level data, especially after the introduction of economic reforms in India. This book under review has made a mammoth attempt to fill this gap utilising district level data covering all the major states of India.

Although this book is completely new in terms of analysis and presentation, it is in a way an extended version of three earlier studies conducted by G.S. Bhalla with well known scholars like Y.K. Alagh and D.S.Tyagi covering the period from 1962-65 to 1990-93. This version of the book extends the period of analysis till 2005-08, wherein the period from 1990-93 to 2005-08 has been considered as the period of economic reforms. With four broad objectives, the study essentially aims to analyse the pattern and growth of agricultural output, growth in productivity of agricultural workers, association between the growth of agricultural output with the use of modern inputs and the degree of regional disparities in the levels and growth of agricultural output at the state, regional and district level. The book has five chapters besides a very large part of appendices which have district-wise data on different parameters for five set of periods, namely, 1962-65, 1970-73, 1980-83, 1990-93 and 2005-08.

As the present book is an extended version of the earlier works, the first chapter provides a brief account on the earlier three books highlighting the methodology followed for the classification of districts based on the value of productivity including the important findings of those studies. What ways this book is different from the three earlier works in terms of defining the districts based on the value of productivity and the methodology followed for estimating the value of output are

clearly highlighted in this chapter. While this chapter is expected to be useful to all those readers who have not got the opportunity to read the earlier works, it also informs the readers about the additional contribution of this book.

One of the key objectives of the book is to study the changing pattern of Indian agriculture especially in terms of cropped area, cropping pattern, use of various inputs and value of output at the state level during 1962-65 to 1970-73, 1970-73 to 1980-83, 1980-83 to 1990-93 and 1990-93 to 2005-08. Therefore, the second chapter has made an attempt to analyse the spatial pattern of changes in Indian agriculture. The important finding that emerges out from this analysis is that the post-reform period from 1990-93 to 2005-08 is characterised by a serious retrogression both in respect of levels and growth rates of yields and output in most states and regions. The authors attribute this to decline in public investment in irrigation and water management and in scientific research. While the reasons highlighted for retrogression in growth of yields and output are partly true, a huge increase in cost of cultivation that resulted in reduction of profitability during the period of economic reforms could be one of the main reasons for this which has not been highlighted as the reason for the retrogression. Can the farmers produce more output when the profitability from crops cultivation is very low or negative?

It is well known that the Indian states are geographically large consisting of several non-homogeneous agro-economic sub-regions with wide variations in inputs use and output growth. Therefore, it is always better to study the regional patterns and levels of growth in agricultural output by taking district as a unit of analysis. Keeping this in view, the third chapter of the book delves with the district-wise analysis on the use of inputs, yield levels, etc. Multiple regression analysis has also been carried out to find out the determinants of agricultural production utilising region-wise data of various districts. The analysis clearly reveals that inter-regional disparities continue to be very prevalent in various parameters considered for the study. It shows that all the districts belonging to the states of Kerala and Punjab were in the high productivity range of above Rs. 10,600/ha. It is also found that none of the districts that come under Punjab, Kerala, Haryana, West Bengal and Tamil Nadu belonged to the low-productivity category during 2005-08. But, on the other hand, about two-fifths to three-fourths of the districts belonging to the state of Maharashtra, Madhya Pradesh, Rajasthan and Bihar are found to have been caught in a low-equilibrium trap. Both the tabular and regression analysis presented in this chapter seem to suggest that these inter-district disparities are largely due to differences in the intensity of use of modern inputs such as fertiliser, tractors as well as in the availability of infrastructure like irrigation, road and markets. While the inferences drawn from the district level analysis seem to be plausible, some of the variables included in the regression analysis seem to be closely correlated. For instance, along with irrigation variable, tube-well irrigation and rainfall variables have also been used in the regression analysis, which are highly correlated. Possibly because of the presence of multi-collinearity, the irrigation variable turned out to be negative and

insignificant in some of the regression models. Are we saying that irrigation is not an important variable in determining the inter-district disparities in agricultural production?

The chapter on spatial pattern of growth of agricultural output compares the district-level growth rates registered during the post-reform period (1990-93 to 2005-08) with the pre-reform period (1980-83 to 1990-93). In addition to this, an attempt has also been made in this chapter to analyse the association between growth rates of output and the intensity in the use of modern farm inputs. The spatial distribution of districts based on their growth rates over various periods presented in the various maps highlights the tremendous improvement in the regional coverage of growth over the period 1980-83 to 1990-93 and then a slowdown during 1990-93 to 2005-08. As per the analysis presented in this chapter, the output levels were very low (Rs. 6700/ha) in about 95 districts during 2005-08, which is about 34 per cent of the total districts considered for the analysis. But there are no clear-cut answers available in this book for this low level of output in about one third of the districts considered for the analysis. More disaggregated study beyond district level needs to be carried out to find out the main reasons for this low output and also to suggest ways and means for improving their output levels.

Besides improving the overall agricultural productivity, there is a need to increase the agricultural workers' productivity as it determines the living standard of the working population in agriculture. The fifth chapter provides a detailed account on the changes in agricultural labour productivity using state and district level data. The analysis presented in this chapter shows that the growth rate in agricultural workers' productivity during the post-reform period has decelerated. This is not something unexpected because when the overall output growth decelerates, as has been noted earlier, the productivity of agricultural workers would naturally go down because it is the ratio of total agricultural output to total number of workers. Taking clue from the regression analysis, the authors believe that by expanding the area under cultivation through intensification of land use, improving education and skill levels of the rural labour force, development of rural infrastructure and agricultural markets, the agricultural workers' productivity can be improved.

Clearly the results presented in the book show that the growth rates of agricultural output have registered a notable deceleration during the post reform period (1990-93 to 2005-08) as compared with the pre-reform period (1980-83 to 1990-93). This deceleration is not only noticed at the all-India level but also observed at the state and district levels. Since the slowdown of agricultural output and yield has many adverse ramifications on the overall growth of the economy, the authors at the end have suggested various measures to improve upon the growth performance of agriculture. One is not very sure whether the suggested measures will be useful to improve the performance of agriculture, because this book has addressed only the issues associated with yield and output and not the expenditure side (cost of cultivation of various crops). Can we decide the performance of agriculture only by

analysing the data related to production without comparing with the cost of cultivation and income?

The farmers are the main players whose role is significant in deciding the agricultural output growth. They have been facing serious problems on account of rising cost of cultivation, which in fact has started increasing after the introduction of economic reforms. This book has silently ignored the problems of farmers arising on account of rising cost of cultivation, which is a limitation of the book. An important aspect of the book is the appendices part, which provides district level data on various parameters of agriculture for all the major states of India from 1962-65 to 2005-08. These data will be immensely useful to researchers particularly to the students who live away from big cities with less access to this kind data sources. Overall, the book reads well and covers the entire gamut of agriculture that too with district level disaggregated data. This book will be useful to the researchers and teachers who are working in the area of production side of agricultural economics.

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*Coping with Water Scarcity: An Action Framework for Agriculture and Food Security*, Food and Agriculture Organization of the United Nations, Rome, Italy 2012. Pp.xvi+78.

*Improving Water Use Efficiency: New Directions for Water Management in India*, Richard Ackermann included in the volume *Transforming Indian Agriculture – India 2040: Productivity, Markets and Institutions*, Edited by Marco Ferroni, 2013, Sage Publications India Pvt. Ltd., New Delhi, 2013 Pp.xxii + 357. Rs. 995.00.

“Application of Frontier Technologies for Agricultural Development”, P.S. BIRTHAL, *Indian Journal of Agricultural Economics*, Vol. 68, No. 1, January-March 2013, pp.20-38.

Last year’s drought in parts of Maharashtra and Karnataka has once again brought into focus the critical importance of water coping with water scarcity has now become a global problem. It is recognised that water plays a role in all sectors of the economy and is essential in achieving sustainable development and reaching Millennium Development Goals (MDGs). (See *Coping with Water Scarcity*, FAO, 2008). It is estimated that 60 per cent more food will be needed between now and 2050 to satisfy demand of an eventual population of more than 9 billion people. The question arises: “Is there enough land, water and human capacity to produce enough

food for a growing population over the next 50 years – or will we “run out” of water? The answer provided by FAO is as follows: “It is possible to produce the food – but it is probable that today’s food production and environmental trends, if continued, will lead to crisis in many parts of the world. Only if we act to improve water use in agriculture will we meet the acute fresh water challenges facing human kind over the next 50 years. Or put another way, business as usual is not an option. Real changes are needed in the way in which water is governed and used if transient and long-term crisis are to be averted”.

Of all economic sectors, agriculture is the sector where water scarcity has the greatest relevance. It accounts for 70 per cent of global freshwater withdrawals. In India the critical role of water for irrigation which represents 90 per cent of total fresh water withdrawals, becomes even more important. Richard Ackerman, a former World Bank official who has examined in-depth the problem of water use efficiency has come up with this slogan. “Focus on water resource management and not water resource development (Improving Water Use Efficiency: New Directions for water Management in India) “Use water efficiently, harvest it locally wherever it makes sense economically and reduce transport”.

Total water demand in India was estimated to be 761 billion cubic meters (bcm) in 2010. This is estimated to reach 900 bcm by 2050. It is estimated that India has about 1030 billion cubic meters (bcm) waters potentially available from internal renewable resources. The potential is dependent on how best we can harvest and conserve rainwater. The potential benefits of rainwater harvesting are thus enormous and if an appropriate water management policy is followed we can meet our demand fully. For instance, one research study has estimated that it is feasible to harvest a surplus run-off of 114 bcms of water from 28.5 million hectares of cropped land in 225 predominantly rainfed districts in the country.

Traditionally, the focus of our policy makers and administrators has been on large and medium irrigation projects which not only involve huge financial investments but also have a long gestation period. Hence such projects have not yielded the desired results. The Eleventh Plan document (2008) highlighted two important deficiencies of such projects. First, many major and medium irrigation projects seem to remain under execution forever as they slip from one Plan to the other with enormous cost and time overruns. Second, the gross irrigated area does not seem to be rising in a manner that it should be given the huge investment on irrigation, the difference between the potential created and the area actually irrigated remaining large. This mindset of planners must change. Storing and replenishing groundwater is surely far more cost effective than building and maintaining surface water structures. Groundwater offers water where and when farmers want it.

No doubt the share of agriculture in GDP has shrunk sharply over the years from say 50 per cent of GDP in the 1950s to some 18 per cent today. But the monsoons continue to have a major influence on agricultural growth. Watershed development projects, both micro and macro, in rainfed areas which account for some 60 per cent

of total cropped area hold out high hopes for future agricultural growth. Capital investment is modest, projects are labour intensive and do not require much technical know-how. By its very nature it is inclusive. There are several success stories of such projects, under the voluntary private efforts. In Maharashtra, Anna Hazare's Ralegaon Sidhi project has now become part of the folklore of watershed development. A more recent example is Hirwe Bazaar a drought – prone poverty – stricken village about 100 kilometers from Pune. The efforts of one man Popatrao Pawar have converted this village into a model village. Former President APJ Abdul Kadam cites the case of Bhadariya, a small village in the middle of Pokhran desert. Kadam has written about how the ashrams of Baba Bhadariya Maharaj has converted this village into an oasis, with watershed development. But these are sporadic and isolated cases. We could have a time-bound programme of development of watershed projects covering the bulk of the eligible area in the country in the next two or three years. Perhaps Mahatma Gandhi National Rural Employment Guarantee (MGNREGA) scheme could focus on these projects in the relevant regions. Such concerted action pursued with dogged determination could yield good results.

Again, BIRTHAL states: "The pressurized irrigation systems, such as sprinkler and drip irrigation systems possess considerable potential to improve water use efficiency and enhance agricultural productivity in water scarce areas. (Application of Frontier Technologies for Agricultural Development, Pratap S. BIRTHAL). These reduce water losses, enhance inputs use efficiency, and control soil erosion. Despite high pay-offs, area under micro-irrigation has not exceeded 4 million hectares or 4.5 per cent of total gross irrigated area, as compared to the potential of 42 million hectares. The Twelfth Plan targets bringing about 10.1 million hectares under macro-irrigation – 4.8 million under drip and 5.3 million under sprinkler irrigation.

For coping with water scarcity "business as usual" approach will not do. Our policy makers should focus on rainwater harvesting and conservation through watershed development, both micro and macro. Increasing water use efficiency through micro irrigation system also become imperative. Development of major and medium irrigation could take a back seat for now.