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BOOK REVIEWS

Prices and Price Policy for Pulses and Cereals (A Study of Production, Prices and Marketing), S. S. Acharya, Department of Agricultural Economics, Sukhadia University, Rajasthan College of Agriculture, Udaipur, 1985. Pp. xviii+439+A-135.

Rajasthan together with Uttar Pradesh and Madhya Pradesh have got about half of the country's pulses area and account for two-thirds of total gram production. Rajasthan's own contribution in national gram area and production is about 22 per cent and 27 per cent respectively, while in the case of moth it is as high as 84 per cent and 70 per cent respectively. Both these crops cover about 84 per cent of pulses area in Rajasthan and about 70 per cent of the production is exported outside the State. Rajasthan thus occupies a very important place in India's pulses economy, and this study undertaken by Acharya on an award of National fellowship from the Indian Council of Social Science Research is therefore a valuable addition to the literature on pulses.

There are 13 chapters and 78 appendix tables in the study. The first chapter deals with the problem and the design of the study is presented in Chapter II. The subsequent chapter takes a macro view of the pulses economy. The results of the study for Rajasthan are discussed in Chapter IV through Chapter X while Chapter XI discusses the results for one district of Gujarat. Chapter XII is devoted to the price policy for pulses and the last chapter presents the summary.

The results relating to production are based on a study of ten important districts, whose primary data from sample farmers of Rajasthan were collected for two agricultural years 1980-81 and 1983-84. The study of markets and processors, etc., also covered about the same period. Many aspects of the pulses economy have been covered and the analytical tools included are numerous such as tabular analysis, growth rates, multivariate principal component model, acreage response models, price and production cycles, seasonal index numbers, spatial price series correlations, marketing margins and price spread, cost of production and marketing, distribution of farmers and area according to levels of cost, Lorenz coefficient of concentration, marketing channels and parity indices. On the demand side, the author has relied on the studies of Chopra and Swami (1975) and K. N. Murty (1983).

Green revolution did not adversely affect gram in Rajasthan as it did in Uttar Pradesh and Punjab. This may be because of significant difference between irrigated and unirrigated gram yields in Rajasthan, and that the parity prices of gram vis-a-vis wheat considered from any angle also remained higher during 1965-66 to 1978-79. In spite of this, the author is much more concerned about the area shift away from pulses and recommends higher support prices for pulses. Support price of Rs. 190 per quintal compared to average cost of Rs. 270 per quintal or market price of Rs. 340 per quintal compared to the bulk line cost of Rs. 357 per quintal for gram estimated in

this study and also the cost of production of moth being Rs. 448 per quintal compared to market price of Rs. 270 per quintal support the suggestion of higher support prices.

The suggestion of a comprehensive inter-State project to study and demarcate the States and regions for various crops based on national requirements and resource use efficiency also need a serious and urgent attention by the policy makers. One of the concerns of such a study, as has been rightly emphasised, should be in respect of the desirability and rationality of crop mixtures in various farming areas and under different climatic conditions and also different agronomical aspects of pulses cultivation. In Rajasthan about 26 to 28 crop mixtures involving pulses were recorded, which also changed frequently depending upon the prices and/or rainfall. The average size of sample farms was over seven hectares. Small and marginal farmers produced 6 per cent of gram, 2 per cent of moth and only one per cent of *mung*. In view of the paramount objective of raising pulses production, large farms, especially in pulses (and oilseed as well) growing areas require special attention.

The mark-up over gram price after processing was found to be around 35 per cent in the case of gram, moth and *arhar* but it was over 50 per cent and 70 per cent in *mung* and *urad* respectively. This point requires further investigation as relative prices of *urad* in Table 9.35 and Appendix Table 39 do not tally. Surprisingly, the farmers in Rajasthan received higher prices by selling within the village than in the regulated market yard while the farmers in Gujarat received higher prices in regulated market yards than those offered by the co-operative societies.

Certain issues emerge from the study for discussion. Gram has maintained its position in Rajasthan but *kharif* pulses have not. This is perhaps because, among other things, the seasonal behaviour of prices is against the interests of *kharif* pulses in which the relative status of gram is also important. The higher parity prices of gram may be due to the period chosen and may not last for ever. The period 1975-76 to 1978-79 as compared to the previous decade was highly favourable to gram in Rajasthan as it was for groundnut in Gujarat. One may add that the crux of the price policy is how to decide the prices of pulses/oilseeds in a bumper crop year and in a drought year. In the former case, the farmers' interests are at stake because buffer stock purchasing is conspicuous by its absence due to support prices generally being lower than market prices while in the latter case, the consumers' interest would not allow the price to rise to compensatory levels and hence even market prices—let alone support prices—would always remain lower than the cost of production.

The average price elasticity of demand for pulses being more than 0.5 and its value being more than one for lower income classes, on the one hand, and low acreage response elasticity of pulses, on the other, make the problem complicated, raising real socio-economic problems.

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Risk Management in Agriculture, Edited by Peter J. Barry, Iowa State University Press, Ames, Iowa, U. S. A., 1985. Pp. x+282. \$ 36.95.

The book attempts to provide a comprehensive coverage of concepts, methods of analysis and practical applications involving risk analysis in agriculture. The risk consequences of farms, with different structural characteristics, are developed in addition to the relationships among agricultural risks, financial markets and public policy. The first chapter sets forth the concepts, methods of analysis and practical applications of risk management in agriculture. The importance of risk in agriculture is reviewed emphasising the close relationships between farm and non-farm conditions. The implications of risk analysis are considered along with the historical developments of important concepts and analytical methods.

The second chapter reviews alternative approaches to modelling and measuring risk attitudes and cites several empirical studies of risk attitudes. The expected utility model (EUM), which is based on a theorem derived from a set of axioms about individual behaviour, is discussed in detail with the help of empirical examples. If a decision-maker obeys these axioms, a utility function can be formulated that reflects the decision-maker's preference. The last section of this chapter discusses direct elicitation of utility functions (DEU), interval measures of risk aversion, experimental methods and observed economic behaviour (OEB) as approaches to study risk attitudes along with empirical studies on risk attitudes and multiple goals and risk analysis.

Risk concepts are identified for three classes of decision rules in Chapter 3 and used to predict or prescribe the decision-maker's behaviour. These rules include: (i) decision rules requiring no probability information, (ii) safety-first rules, and (iii) expected utility maximisation. A simple EUM rule focusses on variance of outcomes; whereas, a safety rule focusses on the probability of loss. The role of subjective and objective measures in positive and normative decision models and evaluation of objective risk measures computed from time-series data are also discussed in this chapter. Most of the discussions in Chapters 2 and 3 are carried further in Chapter 5.

Chapter 4 focusses on the subjective expectations and probability judgements of decision-makers. This chapter also briefly discusses a few methods for obtaining probability statements within the context of assessor-motivation; whereas the final section considers possible areas of application in agricultural economics without any empirical content.

Chapter 6 presents five widely used criteria of risk efficiency: (i) first degree stochastic dominance, (ii) second degree stochastic dominance, (iii) mean-variance efficiency, (iv) mean-absolute deviation efficiency, and (v) stochastic dominance with respect to a function. The first degree stochastic dominance (FSD) holds for all the decision-makers who have positive marginal utility for the performance measure being considered. The second degree stochastic dominance (SSD) holds for all the decision-makers whose utility functions have positive non-increasing slopes at all outcome levels. Like SSD, mean-variance (EV) efficiency requires that the decision-maker be risk

averse, outcome distributions be normal or the decision-maker's utility function be quadratic. When these restrictions are met, the EV efficient set is identical to the SSD efficient set. The mean-absolute deviation (MOTAD) criterion is an approximation to EV efficiency that can be modelled with linear programming. Linear programming algorithms are more widely available and less difficult to use than are the quadratic programming (QP) algorithms required for EV analysis. However, when the distributions being ordered are approximately normal, the MOTAD efficient set closely resembles the EV efficient set. Stochastic dominance with respect to a function (SDRF) is a more dominating efficiency criterion that allows for greater flexibility in representing preferences. It also requires more detailed information on preferences. The SDRF orders uncertainty choices for decision-makers whose absolute risk aversion functions lie within a specified lower and upper bound. Chapter 7 discusses the implications of psychological factors of risk analysis in agricultural economics.

Part 2 of the book is devoted to the discussion on risk analysis in farm business. Chapter 8 identifies five (known) sources of business risks in agriculture, namely, (i) production or technical risk, (ii) market or price risk, (iii) technological risk, (iv) legal and social risk, and (v) human sources of risk. Chapter 9 introduces the methods of risk analysis, presents appropriate models and discusses their advantages and disadvantages based on empirical studies.

Chapter 10 introduces the formulation of programming models for risk analysis in farm firms and also discusses a generalised risk programme model along with the concepts and methodological issues fundamental to model formulation. Both QP and MOTAD models are discussed. An empirical crop diversification model is also presented with assumptions, data requirements and results. Chapter 11 provides an overview of methods and applications of simulation in analysing farm firm performance under conditions of risk. The models show the diversity of simulation approaches, yet also indicate that the common characteristics of simulation studies are made unique to each study's setting and purpose. Chapter 12 comprehensively discusses educational methods for teaching risk concepts within the extension and class-room environments. Several educational approaches are identified and examples are provided, using pay-off matrix and decision tree to solve the real world farm problems.

Part 3 of the book, which includes Chapters 13, 14 and 15 discusses financial dimensions of risk in agriculture. Chapter 13 uses a conceptual model to analyse the financial structure of farm business to evaluate various financial responses to risk. The model is then extended to risk pricing of farm assets in a market equilibrium framework. The later sections of this chapter review empirical studies illustrating that financial responses to risk hold a prominent position among the methods of managing business and financial risks in agriculture. Further, these financial responses are closely related to other responses in the production and marketing organisation of farm firms. The chapter emphasises the development of a comprehensive framework for modelling optimal portfolios of assets and liabilities in farm business, where both the

returns to assets and the costs of liabilities are subject to risk. Agricultural risks and lender behaviour are discussed in Chapter 14. This chapter addresses to the ways financial intermediaries absorb, transmit, or increase agricultural risks. They arbitrage between savers and borrowers. Lenders must cope with liquidity risk and risk of loan loss. Lender's risk is due to the liquidity risk, farm income and default risk; default risk and loan cost; and feed-back effects. Chapter 15 discusses inflation and monetary risks for agricultural producers. The sources and relationships between inflation and monetary risks are discussed in detail. This chapter also discusses the impact of interest rate and credit availability along with possible responses and monetary risks in public policies and financial institutions.

Part 4 of the book is entitled "Policy issues and agricultural risk". Under this part, only one chapter, *i.e.*, Chapter 16, entitled "Agricultural policy and risk", which also happens to be the last chapter of the book, considers the relationship between farm policy and risk in markets for farm commodities and factors of production. Commodity prices, output, farm income, and factors' prices in an uncertain environment are also discussed. The last section of the chapter discusses risk and uncertainty in international trade and policy-induced risk, including domestic policy risks, and international policy risks.

A comprehensive list of literature published on various aspects of risk management in agriculture is given under 'References'. The book is well-suited for students, professional agricultural economists in universities, industry and government who have research and analysis responsibilities, involving risk considerations in agriculture as well as extension workers concerned with agricultural programmes on risk management. The book is exceedingly interesting.

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Indian Agriculture: A Fifteen-Year (1985-2000) Policy Perspective, B. M. Bhatia, Centre for Policy Research, New Delhi-21, 1985. Pp. vii+216 (mimeo.).

Agriculture plays a vital role in building up our nation's economy, as is evident from its contribution to the nation's gross domestic product and employment to the labour force. In fact, it is for this reason that agricultural growth has been the prime concern of the planners and the policy makers from the beginning of the planning era. However, the previous agricultural development efforts undertaken have suffered from inadequate backing of necessary and appropriate policy measures. The emphasis on technology has led to attainment of self-sufficiency in the food front but still quite a large part of population suffers from insufficiency of food in view of lack of purchasing power. The present policy of focussing entirely on seed-fertiliser technology has led to emergence of regional disparities and serious distortion of cropping

pattern and thus jeopardized the efforts of meeting the goals of growth with equity. It is in this context there is an imperative need to have a fresh look on the entire policy of agricultural and rural development. The present study is an attempt in this direction.

The present volume, in the form of a preliminary draft, contains seven chapters. Chapter 1 deals with agricultural growth during the period 1951-52 to 1983-84. There has been a significant increase in agricultural production during this period but the author feels that the achievement is not commensurate with resource allocation to the agricultural sector and is inadequate to make a significant dent on the problems of poverty, unemployment and hunger. Through empirical illustration the author has vividly demonstrated that the agricultural economy has assumed dualistic character and severe regional disparities have emerged accompanied by serious distortion of cropping pattern and agricultural instability.

Chapter 2 deals with the factors that have come in the way of green revolution. The author feels that absence of appropriate and adequate policy support has stood as a stumbling block in the way of full exploitation of the potential of new farm technology. He is quite justifiably critical of the target oriented approach, the reliance on the achievement of which is laid primarily on technology, the availability of modern inputs and expansion of research and extension services. He rightly feels that the technological thrust must be backed up by a package of appropriate policy measures required to motivate the farmer to put his scarce resources to the best use.

Agricultural growth in India over the past 35 years has been characterised by some features which have been discussed with adequate empirical support in Chapter 3. A critical analysis of growth rates of area, production and yield of principal crops reveals distortion and imbalances in cropping pattern. The strategy of concentrating the use of available supply of inputs in areas which held the prospect of best and quickest return, the author feels, has in fact accentuated the already existing regional and inter-State disparities. He quite rightly perceives the emergence of dualistic economy in the form of (i) progressive capital intensive modern and innovative segment located in Punjab, Haryana and Western Uttar Pradesh and (ii) the stagnant traditional and relatively unproductive segment over the rest of the country and very little 'trickle down effect' of green revolution from the former region to the latter one. Through concentration of major development efforts on small regions offering promises for quickest results in terms of output, the limited objective of national self-sufficiency in food supply has been achieved but the opportunity of lifting the sizable proportion of population above poverty line has been lost. It is in this context that the author's suggestion for recasting our policies deserves due attention.

Apart from achieving substantial growth in agriculture, the twin problems of rural poverty and unemployment still exist and grow at an alarming dimension, notwithstanding the massive investment pumped into the public sector during the last 35 years. The target group approach such as IRDP, NREP, RLEGS, etc., has also not shown much promise of success in this direction.

Examining the emerging critical issues in this context, the author has offered an alternative approach to economic development in Chapter 4. He feels that to combat the problem of growing unemployment effectively, it is necessary that additional set of measures is adopted in the form of land reform, promotion of appropriate technology for agricultural growth, larger capital investment in the agricultural sector and active intervention by the state in labour and product markets. Dealing with these measures quite critically, the author has offered suggestions/modifications for implementation. Some of these suggestions such as that concerning the provision of fertiliser subsidies to only marginal and small farmers and making the others pay competitive market price leave a question mark on the feasibility of dual market system side by side without any spill over effect.

In Chapter 5, emphasis has been laid on switch over to a unimodal pattern of agricultural development characterised by gradual but widespread increase in productivity by small farmers adopting technology appropriate to their labour abundant, capital scarce factor proportion, in place of current dualistic or bimodal pattern adopted in the mid-sixties in view of grave national food crisis. The author feels that the scenario of dichotomous division in the agricultural growth profile of the country has to be removed by diverting greater attention to improving the productivity of agriculture in the so far neglected rainfed and arid parts of the country. Similarly, various special programmes related to agricultural and rural development and poverty alleviation should be combined into a single comprehensive programme of development of agriculture in the agriculturally backward areas. In the end, the author suggest a new strategy for development and pattern of growth to tackle the endemic problem of malnutrition, unemployment, low productivity and poverty.

While describing the historical background of the various programmes related to soil conservation and land reclamation in Chapter 6, the author observes that past efforts have not led to any marked improvement in the preservation of ecological balance and maintenance of even the existing level of soil fertility. He feels that there is colossal national waste of scarce land resource which could be covered with vegetation and made productive, if necessary policy thrust and action as well as required public investment are provided. The reviewer has much sympathy with the plea of the author but has apprehension with respect to the capacity of the economy to pump in required massive public investment for the purpose without affecting adversely the interest of other vital sectors of the economy through resource diversion. Critically reviewing the problems/issues associated with soil and water management, the author desires that an integrated development of land and water resources should form the basis of all economic planning in the country. Realising the crucial importance of environmental protection in the context of the country's economic development, the author feels that the country needs, without any further delay, an exclusive perspective plan for tackling the problem of environment. Its approach however has to be developmental rather than static, integrated and holistic rather than problem- and region-specific. The plan should be addressed to conservation,

development and short- and long-term needs of the economy.

In the last chapter conclusions are given. While giving a brief review of development strategy followed in this country in the fifties, sixties, seventies and the early eighties, the author feels that the time has come for serious thinking on the part of policy makers and politicians on the desirability of change in development strategy. It is in this context, however, the author seems to be somewhat pessimistic about any initiative for change in development strategy coming from the Planning Commission. He feels that the present system of planning and development strategy is not sustainable in view of its inherent contradictions and constraints. It has created numerous sectoral and intra-sectoral imbalances in the economy. It is under these circumstances that the various types of policy changes in the agricultural field have been suggested, which the author feels would receive a better deal from those concerned, particularly the ruling elites.

The study on the whole is a commendable effort on the part of the author who, in order to derive strength for his arguments/observations, has made extensive use of empirical statistics. Also there is vast citation of relevant documents/reports. The study is of great interest to planners, policy makers and the academicians. It is hoped that the material provided in the study would form a base for policy dialogues in these quarters, which may be helpful in the evolution of suitable development strategy.

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Technology in the 1990s: Agriculture and Food, Edited by Kenneth Blaxter and Leslie Fowler, The Royal Society, London, 1985. Pp. viii+179. £32.00.

This book is a collection of papers presented in a Royal Society Discussion Meeting held in 1984 "at which contributors were asked to assess future opportunities for technological advance in selected areas of agriculture and food" (p.v). There are 17 papers on the whole, 11 of which deal with research developments in various fields of agriculture and six papers pertain to those in animal husbandry. The papers are mostly of a technical nature and would be of particular interest to the concerned subject-matter specialists.

The rapid strides made by science and technology in British agriculture and food industries during the last 30 years or so have resulted in large food surpluses and the emphasis is now shifting from mere quantity to quality of produce, environmental protection and other similar issues.

The first two papers are concerned with efficient use of available land and water resources in agriculture from a global viewpoint. According to P. Buringh, 75 per cent of all the crop land in the world is under traditional modes of production and yields can be multiplied by about ten times even with the application of available technology. He stresses the need for preservation of land resource through afforestation, restoring natural vegetation on

unproductive land, avoiding over-grazing, etc. G. Stanhill observes that the major opportunity for increasing water use efficiency lies in irrigated agriculture. This can be done even with simple technology like gravity irrigation with a scheduling system based on crop water requirements, as illustrated by the experience of central Chile. Pressurised irrigation systems like sprinklers and drip irrigation can achieve even greater efficiency but at a higher cost.

P. B. Tinker examines the methods of improving the efficiency of fertiliser use (expressed as the proportion of fertiliser recovered in the harvested crop) through more accurate matching of nutrient need, on the one hand, and application rate and timing, on the other. It is assumed that 50 per cent of applied nitrogen is lost through leaching, volatilisation or denitrification. It is possible to reduce such losses by better prediction of nitrogen requirements, chemical control of N transformation and use of more nutrient efficient crops and varieties. The paper by C. H. Reece on the role of chemical industry in agriculture shows close association between the growth curves for nitrogenous fertiliser usage and wheat grain yields. In his view, the scope for biological N fixation through micro-organisms like *Rhizobium* may be greater in developing countries where current levels of N fertilisers are not high. With regard to plant protection, development of more effective and safer pesticides is now possible as exemplified by pyrethroids. On the other hand, the paper by J. A. Pickett foresees the possibility of better and safer crop protection through an integrated strategy including genetic manipulation, production of behaviour-controlling chemicals by plants themselves and use of pesticides.

Exciting applications of bio-technology in plant breeding are discussed in two papers by P. R. Day and M. W. Fowler. Plant tissue culture can help in rapid clonal multiplication of genotypes. DNA probes are proving extremely useful in detecting the presence of systemic pathogens. Directed change in the quality of produce through plant transformation is possible. Commercial use of tissue culture is now largely confined to high value horticultural crops because of its high cost. The conversion of straw waste (which is now largely burnt by English farmers) into a fertiliser, soil conditioner and bio-control agent, through treatment with microbes, is explained in one paper. Another paper illustrates the use of microbial lipases as catalysts to modify the composition of edible oils and convert them into novel confectionery products.

The papers on animal husbandry deal with new developments in animal breeding, feeding and disease control. The techniques of multiple ovulation and embryo transfer have broken new ground and could virtually double the rate of genetic change in cattle, raising productivity and reducing unit costs (R. B. Land). Developments in molecular biology and immunology have provided improved diagnostic tools and vaccines for more effective control of animal disease (P. M. Biggs).

The above papers reveal that biological-chemical innovations are at the base of agricultural transformation in U.K. as they are in India. The production systems in U.K. are of course more intensive in terms of research

and bio-chemical inputs. Also food processing industries are more developed in U.K. than in India and provide good marketing support for agriculture. The strong orientation of research to farm-level problems as well as consumer needs and tastes has greatly contributed to the success of agriculture and food industries. The book will be of great interest to agricultural scientists and others who want to know more about the kind of research under way in British agriculture and what it has in the offing over the next decade. The utility of the volume would have been enhanced if it had included some papers making a hard economic analysis of the technological progress.

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P. Rangaswamy

Productivity in the Indian Economy: Rising Inputs for Falling Outputs, P. R. Brahmananda, Himalaya Publishing House, Bombay-4, 1982. Pp. xvi+280. Rs. 80.00.

It has long been recognised that productivity is an important source of economic growth. Investigations since the mid-fifties by Abramowitz, Solow, Denison and Kendrick into the sources of growth have revealed that productivity was the largest source of real income growth of the present-day developed economies. These studies found that some factor, quickly dubbed 'The Residual' and later called the technical progress, other than the accumulation of capital and labour, was responsible for a very high percentage of the observed economic growth. Productivity change as the major source of economic growth has occupied the central place in the contemporary growth theory. An in-depth analysis of the forces influencing productivity calls for a thorough knowledge of the mechanics of the growth process.

Productivity is, however, an ambiguous concept and its measurement bristles with many difficulties. Most studies in the past used to compute partial factor productivity in terms of labour, capital or other inputs. The single factor productivity (SFP) concept may, however, be misleading. An improvement (or decline) in the output per unit of an individual factor may not be solely due to that factor. The realisation that production is a *joint* result of the combined use of all the factors and that productivity has to be assessed in terms of the growth of efficiency of an amalgam of the factors led to the studies of total factor productivity (TFP) in the early sixties. The TFP measure takes into account both labour and capital simultaneously and is, therefore, more composite. The TFP has now come to be used as a popular index of productivity increase. Two approaches are currently in vogue for measuring TFP. They are: index number approach and production function/cost function approach. Most studies on TFP have used Kendrick's, Solow's and CES indices for measuring the TFP both at the aggregate level and at the sectoral level.

Studies on productivity in the Indian economy are few and far between. Barring, perhaps, the work of Bakul Dholakia's *Sources of Economic Growth in India* (1974), there has been virtually no other full-fledged study of productivity change in India except Brahmananda's present study. The author deserves compliments because his is the first exclusive, comprehensive and painstaking attempt to analyse the productivity trends for the entire economy covering a long period, 1950-81.

The book consists of five parts divided into 20 chapters. It carries a rich recapitulation of classical and neo-classical framework as applicable to the study followed by details of data relating to major factors of production for the years 1950-51, 1960-61, 1970-71 and 1980-81 together with single factor productivity and total factor productivity for the key sectors of the Indian economy with inter-sectoral comparisons of trends and finally comparison with similar trends in advanced economies. The author gives productivity-profit-wage comparisons too. He ends with observations on the applicability of the wage-goods model.

The major finding of the study, as the sub-title of the book rather tersely puts, is that productivity in the Indian economy during the last three decades has either remained stagnant or declined. And the author explicitly attributes this to the nature of the development strategy adopted hitherto. He, therefore, claims that the most effective way to raise productivity lies in changing the development strategy to the 'wage-goods' model. He says: "The economy in which the wage-goods growth is sustained and the growth rate of such supply is higher than population growth rate creates conditions for a high value in the factor quantity multiplier." He adds further: "The wage-goods theory of development which emphasizes the above two requirements (*i.e.*, the control of population and wage-goods development) contains therefore the seed of inducement of high productivity growth rate for any given growth rate in factor quantity" (pp. 206-207). Accordingly, the author calls for increased R & D expenditure to bring about wage-goods biased technical change.

The limitations of data on the Indian economy are well-known. The data on the key variables such as the value added, fixed capital, employment in many sectors are not only not reliable but are not comparable over such a long span of time of three decades. Due to differences in concepts, classification, coverage and procedure adopted by the data gathering agencies from time to time, inter-temporal comparison of data becomes fragile. The author does not, however, spell out how he has overcome such data problems in order to compute a continuous series of productivity indices for four bench-mark years from 1950-51 to 1980-81. Further, a large part of the book consists of a rather lengthy and mechanical description of the data presented in as many as 125 tables. Does a veteran author like Brahmananda perhaps refuse to believe that figures speak for themselves? A serious reader has reasons to question that the analysis covered in Parts 2, 3 and 4 which form the bulk of the book could have been presented in a compact form by eliminating quite

a few tables or relegating them to the appendix and/or by eliminating the monotonous descriptions of the tables.

The book contains extensive grammatical-compositional errors and one wonders if they are printer's devils! Further, the presentation of ideas becomes verbose and confusing at times. Para 4.16 on p. 38 is a case in point. While fitting the Cobb-Douglas production function to the aggregate cross-section data on labour, capital and Net Domestic Product, the author does not, however, spell out the nature and limitations of data nor does he examine the suitability of the type of function used for the purpose (pp. 126-136). The author uses quite a few concepts uncommon in economic parlance but has not tried to define the same either in the text or in the appendix. To mention a few such concepts, 'capital intensity of output' (in the place of simple capital-output ratio?), 'capital intensity of labour' (in the place of capital-labour ratio?), net output-productivity of capital, and so on. And then, there are also words such as 'overmuch', 'limitational', 'going up and up', 'greater than equal to unity'.

The foregoing comments, are, however, not intended to detract from the research value of this study. Substance-wise, Brahmananda's work represents an important contribution to the productivity issue and goes a long way in filling the yawning gap in the literature on productivity change in the Indian economy.

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Agrarian Power and Agricultural Productivity in South Asia, Edited by Meghnad Desai, Susanne Hoeber Rudolph and Ashok Rudra, Oxford University Press, Bombay, 1984. Pp. 384. Rs. 160.00.

This collection of eight essays with an introduction from Susanne Rudolph represents the harvest from the South Asia Political Economy Project (SAPE) co-sponsored by the Indian Council of Social Science Research and the Social Science Research Council in the United States. The distinguished contributors—Donald Attwood, Sukhamoy Chakravarty, B. B. Chaudhuri, Meghnad Desai, Ronald Herring, David Ludden, Lloyd and Susanne Rudolph, and Ashok Rudra—are multi-national (although mostly Indian and American), multi-disciplinary (anthropology, economics, history, political science) and ideologically pluralist.

The 'central problematic' for the volume is the reciprocal relationship between agrarian power structures and agricultural productivity, namely, the ways in which power impinges on productivity levels and changes and how in turn productivity changes might affect power structures. The formulation of the central issue in these terms involves a departure at the very starting point of the enquiry from the strict neo-classical competitive model in which, as T. N. Srinivasan (quoted by S. Rudolph) points out, "no agent

has economic power in spite of... asymmetry. The reason is that each employer is in (actual or potential) competition with numerous others similarly placed employers for the services of his employee so that the asymmetry of hiring or firing does not confer any power on him in the sense of his being able to strike a deal more favourable than the market would allow." However, the problem in the real world arises because power itself "operates on the economic system by preventing markets from coming into existence and by preventing markets from becoming perfect. Political economy having been thus introduced, it becomes possible to define power and to explore its interaction with productivity.

S: Rudolph points out that the abstract definition of power as "the capacity to impose one's will upon another, so that he is obliged to do what he would not otherwise do, or is prevented from doing what he would otherwise do" runs into deep waters because it raises questions of volition, changing consciousness, and false consciousness. Meghnad Desai would prefer to define power as "the ability to do things to others which you do not expect they can do unto you. In its economic and political meaning, power involves *access* to resources, *control* over certain instruments and a *social* relationship." Desai proceeds to outline a model in which power, its aggregation in power structures, and its dynamic reproduction could be conceptualised in measurable form. Ashok Rudra sees power as a social phenomenon, arising from institutional factors (such as class, caste, inequalities in wealth and income and occupational patterns) and ideological forces (such as customs, traditions and taboos). This is a wider concept from purely economic power which arises from command over, and the access to, resources based on assets and entitlements to income. For David Ludden, the economic, political and moral categories of power cannot be sharply demarcated and power has to be seen essentially as an element that impinges on decision-making, resources, and transactions in the everyday social life of agricultural communities.

The interaction between power and productivity is explored from many angles. B. B. Chaudhuri's essay examines the theme with reference to the permanently-settled areas of Bengal and Bihar during British rule. One issue here is the relative importance of local jotedars vis-a-vis Zamindars. Chaudhuri's conclusion is that the control of jotedars at the village level is over-stressed; although Zamindaris were not units of production, Zamindars played an important role in the rural economy; and this role was not always and everywhere parasitical. For instance, in several regions, they made a direct and positive contribution to reclamation after the great famine of 1769-70 by organising labour immigration, financing the initial cost of settlements, and reducing rent. Nor is Chaudhuri convinced that the share-cropping system, which affected only 20 to 25 per cent of total cultivation, was the main factor in depressing agricultural output in Bengal. Chaudhuri also cautions against over-estimating the autonomous role of local rural power structures: wider developments, arising from commercialisation and state

policies in regard to revenue, rents, and trade played an important role in influencing production. Ludden's perspective is historical and methodological. His survey of work on the local history of British India contains an excellent review of literature and an extensive bibliography. He concludes the survey with a strong plea for comparative agrarian history that will pay close descriptive attention to the social organisation of production in particular agricultural milieus. Such an approach will necessarily have to be inter-disciplinary, reflecting the many variables (ecology, technology, markets, availability and distribution of land, caste structures) that combine and recombine over space and time to differentiate agrarian structures. Needed for this purpose is an analytical vocabulary for comparative description, one neither too localistic nor too tied to one theory or disciplinary paradigm.

Herring's essay seeks to sort out some of the major issues involved in the power-productivity relationship in the light of available evidence. For him the deployment of the surplus, extracted by dominant classes, is more critical for explaining changes in productivity than is the mode of surplus appropriation. Small farmers do not necessarily have a productivity advantage arising from intensive labour use because large farmers have superior access to investible surpluses, technology and credit and are less risk-prone. Similarly, he points to a great deal of evidence that share tenancy, "in at least some contexts," is compatible with technical change and relatively high yields. Moreover, the notion of productivity itself is 'conceptually problematic': productivity per unit of land, it has been argued, favours small vis-a-vis large farmers but productivity per unit of labour points to the superiority of larger farmers in efficiency terms. Attwood's case study of sugar production in the Bombay Deccan is the only essay that is directly addressed to how the production process might reshape social structures. His argument is that the entrepreneurial tenant class of Saswad Malis emerged as the dominant group in sugarcane cultivation in Maharashtra because of the high capital costs, the high demand for human capital, and the nexus between assured sugarcane supply and sugar production. These factors were responsible for the actual growers to seek technical as well as organisational innovations (*viz.*, co-operative sugar factories) and prevented the control of sugarcane production from falling into the remote control of brokers or feudal landlords or a narrow stratum of big cane growers. Attwood's description of the swallow is neat but one is not sure whether it makes a summer.

Several essays note the importance of linkages between village, locality, and the state. According to Herring, the "fundamental point of political economy" is that "the power of some classes to appropriate the surplus directly produced by other classes is constituted, guaranteed, enforced and modified by the political power of the state-law, courts, police and bureaucracy." While it is easy to recognise the importance of state power and state policy, it is more problematic to identify the locus of local power. Rudra effectively uses empirical findings from his study of Bengal villages (undertaken along with Pranab Bardhan) to suggest that in important respects isolation and

self-sufficiency characterise the village power structure. *Personal knowledge* subsisting between landlords, tenants and labourers plays a major role determining the transactions relating to labour, lease and credit. Between villages in close proximity with each other differences in regard to wages, rents and rental arrangements, sources and terms of credit are not insignificant. Such differentials are both the consequence and cause of segmented markets. Power as a phenomenon, while rooted in economic disparities, is legitimated and optimised by rich farmers with the use of 'a host of economic and non-economic variables'. A related issue is under what conditions local power and local powerlessness could get mobilised in forms that can influence the state. This is the theme of the contribution from the Rudolphs on the determinants and varieties of agrarian mobilisation in India. Class-caste congruence, ecology, and cropping patterns (as in Thanjavur) have helped in mobilising agricultural labour but the emerging trend is a 'new agrarianism' led by bullock capitalists, largely belonging to the middle castes, who provide hegemony to 'multi-class mobilisation'.

The issue for policy and politics goes beyond the 'narrow economic' relationship between power and productivity on which the empirical evidence is uncertain. It is to aim at both equity and productivity recognising that 'allocative efficiency' has to be evaluated against other possibilities which can result in a fruitful combination of factors of production which are under-utilised. In his essay, which is in the nature of an over-view, Sukhamoy Chakravarty underlines the central importance, in this connection, of co-operation by small farmers in the use of means of production and in the creation of capital. The durable empowerment of the poor and the small, in this view, has to be brought about not just by better distribution of assets but will entail the promotion of sustainable structures for co-operation in the production process.

The reader who expects definitive or radically new insights in terms of empirical analysis or theory or policy on the title-theme of agrarian power and agricultural productivity in South Asia is not likely to be fully satisfied with this collection. To borrow a phrase from Ludden, the book is a 'galaxy of individual enquiries' rather than a coherent enquiry into its self-stated problematic. Besides, the canvas is confined to India and does not extend to other country situations in the rest of South Asia. However, the essays do succeed, in terms of Susanne Rudolph's claim, in providing the reader 'with some sense for the state of the art' and in suggesting many areas which await further research and analysis. Perhaps this is what one can realistically expect, for research too would appear to share some characteristics of agrarian power: while it tends to reproduce itself it is not always possible to establish its links with yield-increases!

The Cassava Economy of Java, Walter P. Falcon, William O. Jones, Scott R. Pearson, and others, Stanford University Press, Stanford, California, U.S.A., 1984. Pp. xxi+212. \$ 38.50.

Economic analysis of cultivated crops from the angles of production, marketing and utilisation often form the basis for making policy decisions with regard to those crops. Such studies are either non-existent or rare for a crop like cassava which is grown throughout the tropical belt of the world and forms the staple/secondary food of about 400 million people in these regions. In this context, the book under review is a pioneering effort especially in the sense that it approaches the economic aspects of cassava in Java from its totality. The book is written on the basis of survey of farmers, marketing personnel, traders and policy makers besides utilising the secondary data regarding area, production, export and import of cassava and its products. It contains seven chapters giving a detailed account of the production systems, marketing and utilisation aspects with a concluding note for the policy makers as to what should be done for cassava improvement in Java.

In the chapter on production systems, it is documented that cassava is cultivated in three major regions of Java with an yield range of 7-12 t/ha and mostly inter-cropped with either upland rice, corn, peanuts or soybeans. Much emphasis is given on fertiliser application and the results of fertiliser trials on cassava conducted in Java are discussed in depth. Additional information on choice of varieties and treatment of cuttings prior to planting is also given. A comparative profitability analysis of the local practice and the improved practices developed at Central Research Institute for Agriculture (CRIA), Indonesia revealed that there is considerable potential for increasing the productivity in most of the survey area cropping systems. In this regard, the need to have on-farm testing of most of the CRIA packages is stressed. The authors should have given under this chapter the details of agronomic practices such as spacing, method of planting, interculturing, etc., as adopted by the farmers, thus enabling the readers to know the differences in the tuber yield in various cropping regions.

While discussing the consumption aspects, it is observed that the Indonesians consume about half of the cassava grown in the form of gapek (chips), followed by starch and fresh roots. As a vegetable, cassava leaves are also consumed to a certain extent. Regional, seasonal and income groupwise analysis of cassava consumption in comparison with other food crops has brought forth the importance of cassava in the diet of Indonesians. The consumption of cassava at various price and income levels for both rural and urban Java is worked out and the analysis showed that the demand for cassava would increase with a corresponding increase in income and as well by a decrease in the relative price of cassava.

The details of starch manufacture from cassava roots are covered under the chapter 'Starch'. Taking the present world trend in starch trade, it is analysed that starch as such may not have much promise in world market and new products like fructose, etc., are likely to be in demand in future. It is noted that about 25 per cent of the cassava produced in Indonesia is processed into starch presently. Of the three production systems existing in Java, *i.e.*, household production, medium scale production and large scale automated production, the first system is more profitable than the other two from the social profitability analysis. Moreover, it is expected to generate more employment potential in the rural areas.

Gaplek (chips) making in Indonesia accounts for nearly half of the cassava produced in the island. The authors have explained with supportive data the linkage existing between the local gaplek production and marketing with the agricultural policies, feed formulations and animal population in major EEC countries. Thailand and Indonesia, being the major exporters of gaplek, a comparison is made between these two countries with respect to their response to the price effects of the Common Agricultural Policy (CAP) of the European community. While Thai exports benefitted from the development of excellent roads and area expansion under cassava, in Indonesia there was little scope for area increase and the CAP-driven price increases were not sufficient to cause extensive switching from other crops to cassava.

Cassava, either as fresh root or gaplek, mostly passes from farmers to assemblers located within the village and from them it is sold to the wholesalers in the main trading centres. Sale of produce before harvest is also a common practice wherein price risks are transferred to the traders. Increased investment on road construction and maintenance, increase in the number of trucks, subsidy on diesel prices and sufficient availability of quick market information at cheap cost have led to an efficient market system in Indonesia which encourages good competition. There exists a strong link between the world and domestic cassava prices of Java. Export floor price for cassava, domestic demand and supply, and rice prices and rice price policy greatly influence the local cassava price. It is established that fluctuations in cassava prices are mostly due to government policy, world cassava prices, and changes in demand for cassava and its substitutes and not due to market inefficiency.

It is felt that cassava is an indispensable crop in the upland regions of Java and its cultivation is socially profitable. There is good scope for increasing its productivity without much investment and with the adoption of CRIA package of technologies, cassava can increase the returns to land, generate more employment potential and income increase among the poor cassava growers, which will bring in regional equity in the island. In this connection, the authors suggest a set of policy decisions which include conducting decentralised variety-cum-fertiliser trials for production increase, more investment to support food technology experiments with cassava, higher expenditure on roads and making available more formal credit to expand domestic marketing system. Finally, the authors make plea for a shift in the government programmes towards cassava in the Fourth Five Year Plan of Indonesia.

This book is an useful guide for the researchers on cassava as well as policy makers in the tropical countries where cassava is important, to help them understand the crop from the angles of production, utilisation and marketing, so as to make necessary policy decisions regarding cassava improvement in the respective countries.

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Direct Attacks on Rural Poverty: Policy, Programmes and Implementation, Prabhu Ghate, Concept Publishing Company, New Delhi-15, 1984. Pp. xvi + 597. Rs. 200.00.

A variety of anti-poverty programmes were being implemented in 1976, many of them as part of the Integrated Area Development Project (IADP) in Ghazipur district of Eastern Uttar Pradesh, which is one of the most backward regions of India. The author who was then working as Director of the Planning Research and Action Division of the State Planning Institute, Lucknow, took up the study of the weaknesses and the strength of the IADP and the book embodies the main findings of the study. In fact, the book is a revised version of the author's doctoral dissertation on the subject and it bears the mark of both the prolixity and discursiveness which generally characterise Ph. D. theses.

The main conclusions of the study, read in 1987, appear all too familiar. This is because the deficiencies in the IADP pointed out by the study have been corrected in the designs of the subsequent versions of the poverty alleviation programmes like the Integrated Rural Development Programme (IRDP), which are being implemented in the rural sector. For instance, the more recent anti-poverty programmes have adopted the household approach to tackle poverty. Similarly, the strengthening of the institutional infrastructure depends upon better management in improving the delivery of credit, in enhancing the effectiveness of the extension organisation and activating the poor for involvement in the programmes; this has now become part of the accepted philosophy of all such anti-poverty programmes. To say this is certainly not to belittle the importance of the investigation conducted by Ghate and the relevance of the findings for subsequent streamlining of the various anti-poverty programmes. What is sought to be emphasised is that, at this stage, the author's study would have a historical value in terms of tracing the evolution of the anti-poverty programmes which have today acquired not only a more sophisticated form but have also become an integral part of development planning. In this sense, Ghate's study is essentially 'dated'.

The author has also clearly brought out that the administration and management tasks of such programmes were in fact largely neglected. He has offered some practical suggestions for vitalising the development bureaucracy.

He has discussed the Antyodaya programme which later became, in a sense, part of the IRDP. Ghate must be commended for having provided very useful insights into the processes and problems of implementing the IADP in Ghazipur district.

When he moves on to consider the *macro-dimensions* of the poverty programmes, Ghate appears to be on less surer grounds. For instance, he views the anti-poverty programmes not as an alternative but as an essential supplement to the longer term development programmes which make an impact on poverty through the 'trickle down' process. Today, IRDP has become part of the normal development plan. Moreover, the deficiencies of the IRDP which has assumed larger dimensions in the Seventh Plan have been more thoroughly dealt with by scholars like Nilakantha Rath. The neglect of the supply factors in relation to providing the inputs to these programmes as well as the demand factors which could act as a constraint on the output expansion targets implicit in these programmes, absence of backward and forward linkages in these programmes—all these have been more meaningfully analysed.

In fact, the recent reappraisal of development economics appears to have added a new dimension to the whole gamut of anti-poverty programmes. Ultimately, as A. K. Sen has pointed out: "The process of economic development has to be concerned with what people can or cannot do, *e.g.*, whether they can live long, escape avoidable morbidity, be well nourished, be able to read and write and communicate, take part in literary and scientific pursuits and so forth." If the development process is viewed from this broader perspective, the anti-poverty programmes will have to become not a peripheral but an integral part of development itself. Future research on such programmes would therefore have to be conducted in this broader framework.

Bombay.

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Agrarian Reforms and Institutional Changes in India, T. Haque and A. S. Sirohi, Concept Publishing Company, New Delhi-15, 1986. Pp. xvi + 268. Rs. 200.00.

The book is an useful addition to the subject of agrarian reforms and institutional changes. It is divided into four parts and contains 17 chapters. After introducing the subject in Part I, the authors discuss a number of topics in Part II. These include historical evolution of agrarian policy, abolition of intermediaries, security of tenancy, regulation of rent, ceiling on land holdings, consolidation of holdings and the condition of small and marginal farmers and agricultural labourers. The changes in agrarian structure since Independence have also been examined. Part III deals with the institutional changes in agriculture which include organisation of agricultural research and extension, supply of credit by co-operatives and other institutions and arrangements for agricultural marketing and distribution. The progress of co-operative farming and public irrigation system is also examined. Part IV of the book gives the summary and conclusions.

The study gives a critical account of various measures adopted in the past in the direction of agrarian reforms and institutional changes in India. An important feature of this study is the discussion of the problem in the inter-regional perspective and the identification of constraints to agrarian reforms and institutional changes. The comprehensive bibliography given at the end is indicative of the fact that the authors have drawn heavily on data from various published and unpublished sources, which include Government reports, books, research reports and research articles, etc. The material has been supplemented by the authors with their own observations and a critical appraisal of the different measures is given at the end of each chapter. A section at the end highlights the lessons of past experiences and presents a blue print for the future. In this section, the authors have made a number of pragmatic suggestions for giving a proper orientation to the policy on the subject.

However, there are a few suggestions given by the authors that merit a critical comment. The authors have observed: "The right of ownership should be conferred on all tenants except in those cases where large farmers have leased in land from small and marginal farmers because such lands need to be restored to owners along with provisions of credit, water and co-operative farming. State governments should purchase all lands directly from land owners and give them to poor cultivators on payment of nominal price, spaced over several instalments" (p. 245). In making this suggestion, the authors implicitly recognise the continuation of tenancy over a large area owned by small and marginal farmers. What about those situations where the tenants and the lessors both belong to the small and marginal farmers' category? Also, the suggestion that the Government should purchase all lands from landowners and give them to poor cultivators on payment of nominal prices would involve huge financial implications and would be difficult to implement. Even then, it would be difficult to prop up these economically unviable holdings through outside support. Earlier experiences in this direction where surplus lands were given to the small and marginal farmers and landless workers for cultivation have not been very happy.

Another suggestion relates to lowering the ceiling on holdings to two hectares of all types of irrigated lands and four hectares of all types of unirrigated lands. A two-hectare holding even if irrigated would be able to generate a rather small income for the cultivating families in most of the cases. This suggestion of the authors would amount to limiting the farm incomes to a very modest level for a majority of the cultivators and would amount to the creation of sharp economic dualism in the country, particularly when there are no ceilings on urban wealth and incomes. More importantly, one fails to understand what kind of technology the authors have in mind for carrying on cultivation on two-hectare holdings. Adoption of modern technology particularly tractorisation would be difficult in such cases.

The authors have also suggested the setting up of co-operative farming societies particularly for small and marginal farmers. Such a suggestion

may be alright on ideological ground but has little scope of success if the prevailing socio-economic matrix and past experience are any guide.

These comments, however, are no reflection on the quality of the work. The book is a praiseworthy attempt to knit together the available information on the subject in an intelligent manner. It should be of value to students of economics and other social sciences, teachers, research workers, planners and administrators.

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Rice Production: Potential and Constraints (A Case Study of Productivity Backward Region), G. S. Kainth and P. L. Mehra, Inter-India Publications, New Delhi-15, 1985. Pp. xv+144. Rs. 180.00.

The book under review is a diagnostic exploration of the various constraints in rice production in Amritsar district of Punjab. The objectives of the study were to examine (i) the growth and regional disparities in rice production and contribution of acreage and yield to rice production, (ii) the producers' response to prices, that is, market supply response and production response, (iii) the productivity response to agronomic managements, such as transplanting time, plant population, nitrogenous fertiliser use and maturity period, and (iv) the sources of the inter-regional (tehsil) variations in paddy productivity.

The book contains five chapters. The introductory chapter sets out the objectives and methodology of the study. The discussion in Chapter II which deals with production and market supply response of paddy is organised under three sections. The first section in this chapter describes the characteristics of the study area, the second section deals with the producers' response to prices and the third section examines the supply response of marketing services. The discussion pertains to the trends in area, production and marketed surplus of paddy. Chapters III and IV discuss the productivity response of high-yielding varieties (HYVs) of rice and the sources of regional variation in rice productivity respectively. The last chapter presents a summary of the findings of the study.

It has been stated in Chapter II that output of rice showed a persistent upward movement extending over a span of 16 years (p. 16), though there had been dips in the output of rice in 1972-73, 1974-75, 1979-80 and 1980-81. It has not been explained why this dip occurred. It may be due to droughts or attack of diseases, insects and pests. It has also been stated that the "Indices of wholesale and harvest prices of paddy were worked out by taking average of all the years as base equal to 100" (p. 20). It is not clear on what logic the average of all the years was taken as the base. The study revealed that the

trend growth rate of wholesale price of paddy was Rs. 9.33 per quintal during 1966-67 to 1981-82 and that of harvest prices was Rs. 3.83 per quintal. The policy implications of this variation in the rate of growth of paddy prices have not been highlighted by the authors. High growth in the wholesale price indicates that wholesalers gained more than the producers. The price parity indices revealed that the terms of trade did not remain very favourable to paddy in relation to competing crops. Market arrivals of rice were found positively related and two-year lag equation gave better result than current year and one-year lag model. The low R^2 value indicates that the equation explained only 33 per cent of the variation in the production of rice. It establishes the possibility of other factors affecting the volume of production. Another finding of the study is the positive response of prices to land allocation. It is also noted that the supply of marketing services is fairly elastic in the food-grain marketing system in the study area.

In Chapter 3, figure 3.1 on p. 49, average yields of different varieties of paddy in Amritsar are presented. It would have been better if the authors had also shown the potential yield of these varieties. On p. 51, it has been stated that in Patti tehsil, the difference between the average yield of Jaya and PR 106 was significant, the difference being of the order of about 16 quintals per hectare. This inference is not very sound as PR 106 yield is based on only two observations. The variation in the yield performance of different paddy varieties is ascribed to differences in input use and the cultural operations. The performance of the three varieties, *i.e.*, PR 106, IR 8 and Jaya within the region was found identical. The study also showed that all the varieties yielded more when these were transplanted during normal conditions followed by early and late transplanting. The evidence relating to the response of yield to nitrogenous fertiliser use is of little utility as available N in the soil is not known in the absence of soil testing. The study concludes with the help of multiple regression analysis that the time of transplanting, plant protection measures, plant population and fertiliser consumption significantly affect the productivity of paddy.

To examine the sources of regional variations in rice productivity, the various factors influencing productivity are grouped under four categories, namely, demographic, climatic, technological and institutional. The demographic factors affecting productivity analysed by the authors included population density, gross cultivated area, net irrigated area and rural literacy (a proxy for managerial efficiency). The results of regression analysis of the relationship between productivity of rice and institutional variables indicated that the effect of irrigation was significant at one per cent level of probability and the remaining variables were significant either at 10 per cent level or at 20 per cent level. In other words, variables like population density, rural literacy, consumption of power, number of markets, tractor intensity, pesticide dealers, fertiliser consumption, co-operative credit, rainfall, cloudy days or percentage of irrigated area did not have any significant effect on rice productivity. An important contribution of the study is factor analysis to isolate the contribution of the different variables. Three factors, *viz.*, technological

and demographic, water resource and infrastructural variants accounted for most of the variations in the productivity data. The set of these factors explained 88 per cent of the variations in the data.

There are a few errors and inconsistencies in the section on methodology. On p. 5, instead of using the terms Least Squares Method, Least Square Method is used which is incorrect. On the same page, it has been stated that to test the statistical significance of the growth rate, 't = r/s' test was applied. In fact, it is 't' test and it should have been stated first followed by its formula which the authors have given and the specification of the notations. Similarly, in the formula for S. E., $\log e^{10}$ is used. It should have been stated as $\log 10^e$. In the same equation, the notation ΣT^2 is used. It should be $\Sigma (T - \bar{T})^2$ or it should have been specified below the equation. On p. 6, the expression of the formula of Chi-square is not correct. The authors have used in denominator $mm(n+1)$. It should have been stated as $mn(n+1)$. The authors have used the term one and two previous years price. For better understanding it should have been one and two year lag prices. On p. 7, the term 'Least Significance Difference (LSD) test' has been used but it should be only Least Significance Difference (LSD). Similarly, in the next para, the authors have erroneously used the word multivariate regression model. The correct term is multiple regression model. Error term is also missing from the model given on p. 7. Before using time-series data, the authors have not tested the presence of auto-correlation, therefore, the results of their analysis may be questionable.

The book includes four technical annexures, namely, I. Etymology of rice and its varieties; II. Land reclamation technology: its impact on production and income level; III. Regional spread of bacterial blight of rice and its impact, the yield-estimation and comparison; and IV. Incidence of micro nutrient deficiencies. Very little use has been made by the authors in the text of technical annexures II and III. The book also contains 17 statistical annexures. The authors have used 't' test in the statistical tables IV, VI, VIII, X, XII and XIV. More appropriate test for the data given in these tables would be analysis of variance rather than 't' test.

As a case study, this book is a good attempt but its conclusions cannot be generalised for the State as a whole as the study pertains to Amritsar district only. The price of the book seems to be very high.

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*Operations Research in Agriculture, Parkash Mehta, Ashish Publishing House,
New Delhi-26, 1985. Pp. vii+258. Rs. 175.00.*

There has been a long felt need for a book on applications of a wide range of available quantitative techniques for optimal agricultural decisions sought by the farmers, policy makers, agro-business managers and researchers within

the frame of socio-economic, political and geophysical environment of India. Hence, as one goes by the title, the book is received with a great anxiety. However, this is the only score the book is able to secure from a concerned reader. In the Preface, the author contends that the book is (i) an outgrowth of a course taught, (ii) designed to serve as a text for two semester courses, one at the Master's level and the other at the Doctoral level, and (iii) new in terms of agricultural examples used for illustrations. That the book is an outgrowth of a course taught becomes evidently clear from the text which, by and large, seems to be a compilation of class notes prepared with a view that details would be explained on blackboard or through narration. The other two contentions have remained only as intentions.

In terms of coverage, the book is organised into fourteen chapters. Chapter I presents an elementary (very naive) introduction to the subject-matter and scope of operations research (OR) in general. In the field of agriculture, the introduction of OR methods does not cross the boundaries of maximisation of farm income and production. In fact, the OR methods have found even wider and deeper applications in agricultural development planning. In Chapter II, a brief exposition on matrix algebra is presented, which as such is of little help to a beginner because many important concepts, such as positive definite/negative definite, orthogonality, Hessian determinant, principle minors, etc., are not explained in this chapter though referred in the subsequent text. An elaborate appendix on matrix algebra could have been more useful than a condensed chapter in the text itself. Chapter III discusses the concept of optimisation process. Though brief, it covers a good exposition of the subject. However, the concept of saddle point, so important for duality exposition, is not duly explained. Another major deficiency is the missing geometric interpretations to facilitate intuitive understanding of the subject. After discussing the unconstrained optimum, the text straight away switches over to constrained optimum without introducing the nature and types of constraints operating in the real world situations, particularly in agriculture. Similarly, the conceptual frame underlying inequalities, convex and concave functions, local and global optimum, convergence, lagrangian function, etc., are not properly described leaving a beginner lost in the wilderness of these mathematical jargons. Chapters IV to IX deal with linear programming, integer programming and transportation problem. These chapters cover the usual subject-matter of problem formulation, its geometric interpretation, simplex algorithm, sensitivity analysis, modified simplex method, Gomory method of integer programming and the classical transportation problem between a given set of production and demand regions.

Chapter X briefly touches the concept of planning under risk. The quadratic programming algorithm and spatial equilibrium model based on Samuelson's approach are briefly outlined in Chapter XI. Similarly, a very brief presentation on dynamic programming and Markov chains is given in Chapter XII, and game theory in Chapter XIII. Lastly, Chapter XIV covers a fairly exhaustive treatment of inventory models using calculus approach. However, the dynamic formulation of inventory model is comple-

tely left out. Thus, the book largely concentrates on linear programming and its extensions, and gives only a brief description of algorithm relating to dynamic and non-linear models. The other OR methods, like network analysis, Queues theory and Simulation models, which have also found useful application in agricultural decisions, are not covered at all.

The book lacks freshness in approach in presentation and fails to sustain the reader's interest. There is undue concentration on the mechanics of the techniques without explaining the conceptual framework underlying them. As a large part of these mechanics is now programmed on computers, the book was expected to deal more elaborately with concepts and problem formulation. As for the illustrations from agriculture, only farm planning examples are used to demonstrate the application of various OR techniques.

More glaring than the above-mentioned weaknesses are the deficiencies relating to presentation and editing. The book exhibits a casual write-up on such a profound and ponderous subject. Besides mistakes relating to improper syntax, the sub-topics of a chapter are not properly sequenced into various sub-sections to facilitate cross reference and reading flow. The printing mistakes are even more serious. There is hardly a page without a large number of such mistakes. The printing mistakes relating to mathematical symbols confuse the reader more than his grasp. No book replete with so many printing mistakes could be so highly priced.

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A Practical Guide to Financing Integrated Rural Development, M. G. Mulmule, Sultan Chand & Sons, New Delhi-2, 1985. Pp. xi+560. Rs. 40.00.

The book is an useful attempt to put together various policies laid down by the Government of India, Reserve Bank of India, NABARD, etc., in the form of Guidelines to finance various rural development activities. The preamble itself is very illustrative and spells out the concept of Integrated Rural Development in very clear terms. Apart from bankers, it also helps others who are interested in the subject.

Chapters on Lead Bank Scheme and preparation of credit plans is very exhaustive. A comprehensive coverage of the entire Lead Bank Scheme is given. This is useful even for the district administration. The chapter pertaining to financing of agriculture again has been exhaustively dealt with, giving cost of cultivation and economics of various crops. It would have been useful if the mechanics of preparation of area development schemes and project lending had been included in this. Marketing aspects of various commodities would have made the chapter more useful to the financing

agencies. The chapter pertaining to financing farm mechanisation appears to be based on the routine experiences, particularly the aspects of agro-service centre is more theoretical. The experience gained in this field should have been discussed.

In the chapter on "Financing Activities Allied to Agriculture", the details of the scheme narrating factual information on various aspects have been given. During the last one decade, the banks have gained a lot of experience in financing milch animals and allied activities, sheep and goat rearing, poultry farming, etc. It would have been better if some of these were discussed in the book so that it would have given an insight into the practical problems of making these enterprises successful. But for this, the information is very illustrative and useful to the financing agencies.

While discussing the aspects of gobar gas plants, the advantages and disadvantages of KVIC model and other models could have been discussed. A supervisory scheme of KVIC being implemented by some of the banks has not found a place. The chapter on financing of small scale and rural industries lists the various purposes for which credit can be made available by the banks. Of late, NABARD has come forward to refinance the cottage and tiny industries. This information would have been of greater use to the financing institutions. Again, a lot of experience is available with the banks in financing rural and cottage industries and in Service and Business Sector. A discussion on the experience of success and failure would have given a better insight into the subject for the beginners.

It would have been very useful if the compelling reasons for fixing targets under the various poverty alleviation programmes recommended by Krishnaswamy Committee, Ghosh Committee, CRAFTICARD, CALCOB, etc., were discussed. It should have given a better appreciation of the target approach.

Extension education coupled with financing ensures better end-use and increased production. Many banks have realised the importance of organising Extension Education Programmes through branches and other functionaries. A chapter on the bank's role in promotional activities would have been a welcome addition to this book. Many useful experiences have been gained by different commercial banks on various policy guidelines issued by the Reserve Bank of India and Government of India from time to time. These experiences and success stories would have been of greater use to a layman.

While the attempt made in this book to give all details about financing various agricultural and rural development activities is appreciated, the minute details like documentation, forms to be taken, appraisal to be done look to be a little too much. These are available in the respective guidelines issued by the branches themselves. Instead of these details, space could have been utilised for the special topics mentioned above. However, it is conceded that the literature on financing agriculture and rural development activities in this country is yet to develop. Viewed from this angle, this book is a welcome addition and definitely of use to the new comers to the banking field and to

the executives who have less time to go through the manual details and to have this on their table as a reference book.

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Bank Finance for Rural Development, Edited by L. K. Naidu, Ashish Publishing House, New Delhi-26, 1986. Pp. xi+388. Rs. 200.00.

The book under review contains a collection of 32 papers presented by the economists as well as professional bankers at a National Seminar on 'Bank Finance for Rural Development' jointly sponsored by the State Bank of India and Department of Economics, S. V. University, Tirupati in 1984. The value of the book is greatly enhanced in so far as it includes papers not only of theoreticians but also of professional bankers and experts in the field. So much has been said, in fact, in this volume that it appears to be impossible, however, to discuss even the main themes in this review. So, an attempt is made only to pick up some essays at random just to indicate to the reader what he would find on the subject in this volume.

The first paper on "National Perspectives for Rural Development during the Seventh Five Year Plan" by discussing the dynamics of rural development, enriches our understanding of the various issues involved in the process of rural development. The author pleads for democratic decentralisation of the planning process. District planning, according to him, has to be placed on a strong footing. He argues in favour of evolving primary growth centres for the dissemination of the benefits of development in rural region. He argues that the growth centre oriented development strategy during the Seventh Plan has to place employment generation as the central objective of rural development. This introductory paper by raising certain basic issues acts as a background material for further discussion on the subject.

Out of the remaining 31 papers, except six papers, all the others deal with the same subject, "Role of Bank Finance in Rural Development" in one form or the other. All these papers, by and large, have discussed such issues as the evolution of rural credit structure, the issues involved in rural development, various schemes of the Government like IRDP, NREP, etc., for uplifting the rural poor, the performance of the banks in the field of priority sector advances, district credit planning, weaker section financing, and the problems faced by the banks in rural lending like mounting overdues, declining profitability, duplication in financing due to multi-agencies, etc. The role played by the Rural Regional Banks is also discussed in some of these papers.

The other six papers have dealt with some other issues involved in rural development. For instance, there are papers exclusively on topics like the Integrated Rural Development and NABARD, Evaluation of

Institutional Finance, Some Rural Development Schemes for Weaker Sections, Borrowing and Repayments—A Study of Financing Agriculture in a Backward District, etc.

In one of the papers, an important issue about the reluctance on the part of the commercial banks to lend to agriculture and other priority sector is raised and discussed in detail. It is argued in the paper that the banks have been showing non-commercial behaviour in respect of lending to agriculture. "When the Government directed them to go to rural areas, as shrewd businessmen, they used the opportunity to mop up rural savings (which probably would have remained in the rural sector) and divert it into urban areas. The quantum of credit mopped up from the rural areas as deposits far exceeds the quantum of credit given as loans to agriculturists. The extension of banking into the rural areas has only led to the driving up of the traditional sources of credit of the rural farmers" (pp. 274-275).

There is no doubt that the banking sector, instead of its erstwhile mere 'demand following' attitude, ought to play a more dynamic 'supply leading' role in all its credit operations. But while commenting on the passivity of the banking sector, one has to take two important factors into consideration. In any successful economic operation, bank finance is only one of the important inputs. Unless all the backward and forward linkages are met by the governmental and other developmental agencies, mere bank finance may not bring the results to the desired extent. There are other crucial infrastructural facilities upon which the success or the failure of any productive venture depends. In fact, various evaluation studies on the impact of IRDP reveals that the mass loan distribution under this scheme has not brought the desired results due to the gross negligence on the part of the government to supply other required variables to make the scheme a success.

The second important factor one has to bear in mind is that the banks, unlike the government, has been dealing with somebody else's money. Therefore, it is the bounden duty of the banks to be reasonably cautious in all its transactions.

The flight of resources has been, no doubt, unabated from rural to urban region. Taking note of this trend, the Reserve Bank of India has already fixed a minimum credit-deposit ratio that has to be maintained in the rural areas by all the commercial banks. However, while commenting on the flight of resources, one should not lose sight of the fact how the banks have helped monetising the rural economy.

On the whole, there is novelty in much that is said in the collection of papers as most of the papers have attempted to critically evaluate the role of banks in rural development in a practical angle which would help both the professional bankers and the academicians. The book is a welcome addition to the literature on rural banking.

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Irrigation Management in Developing Countries: Current Issues and Approaches, Edited by K. C. Nobe and R. K. Sampath, Studies in Water Policy and Management, No. 8, Westview Press, Inc., Boulder, Colorado, U.S.A., 1986. Pp. xix+547. \$ 47.00. (Suppliers: Wildwood Distribution Services, Unit 3, Lower Farnham Road, Aldershot, Hants GW 12, 4 DY, U.K.).

The book under review consists of seventeen papers plus a short introductory paper by its two editors of the Department of Agricultural and Natural Resource Economics, Colorado State University, where the India Irrigation Management Training Programme had been conducted with financial support of the New Delhi Mission of the USAID. The papers are divided into three parts. Part 1 contains five papers that deal with methodological and conceptual issues. Part 2 also has five papers which relate to economic aspects. The seven papers in Part 3 cover institutional and management aspects. The central concern is: "Investments in Third World irrigation projects of all sizes in the post-war period have not been as productive as expected. As the costs of new projects escalate and as the debts from past projects drain resources from national treasuries, aid recipients and donors have come to realize the importance of obtaining greater payoffs from existing infrastructure" (p. xvii).

According to Nobe and Sampath, "there is ample evidence that low irrigation efficiency levels and overall poor performance levels of major projects developed since World War II are primarily the result of poor project and programme management, rather than being attributed only to poor farming practices and/or to faulty engineering design of the associated civil works" (p. 1). But one cannot wholly accept their following assertion that "in some countries, such as India, where major expansion of irrigation projects is still under way, loss of cropland to waterlogging and soil salinisation is almost offsetting the acreage being added by new projects" (p. 3). While this may be true for Egypt and Iraq, it is not so for India, where the affected area is hardly 10 per cent of the total irrigation capacity—Ian Carruthers mentions an estimate of 5 to 7 million hectares in his paper on waterlogging/salinity on p. 266.

The contents of Part 1 may be of little interest to economists who may find Part 2 more engrossing. The first paper, entitled "Irrigated Agriculture: A Comparative Analysis of Development Concepts", is by Wayne Clyma. In a historical perspective he comments on numerous models advocated since 1974 for the improvement of irrigated agriculture. In the next paper, Roberto Lenton offers his critical appreciation of the new ideas in the world of management of large-scale irrigation projects, and rightly cautions us that "a focus on methodologies might bring with it an excessive pre-occupation with process instead of output" (p. 62). In his paper on "From Diagnostic Analysis to

Designing and Conducting On-farm Research", Willard R. Schmehl observes that "one of the limitations in developing improvements in an irrigation system generally is its high cost, a cost usually more than a small farmer can afford" (p. 91). While J. Mohan Reddy gives an exposition on the management of gravity flow irrigation systems, John A. Replogle gives an excellent exposition of tools/concepts for better use of irrigation water.

Robert A. Young explores the question of valuation of irrigation water in his paper on "On the Allocation, Pricing and Valuation of Irrigation Water". For Aswan dam in Egypt, he finds area-based pricing as efficient as the one based on volume of water. Sam H. Johnson III has appraised social and economic consequences of investments in groundwater irrigation in Pakistan and Bangladesh. He is not happy with government tubewells, and is inclined to private tubewell irrigation. While this makes sense for Pakistan where land holdings are large, one wonders how small farmers in Bangladesh would surmount their twin disability of farm size and land fragmentation in establishing their own tubewells. Dan Yaron's paper is a very illuminating exploration in the economics of irrigation with saline waters. He thinks the much-applauded use of drippers for irrigating horticultural crops with saline waters in Israel is open to debate. He emphasises that an 'x' per cent reduction in crop yield due to soil salinisation might give rise to '2x' per cent reduction in income to farmers whose lands get affected by soil salinity. Ian Carruthers' paper on "Irrigation, Drainage, and Food Supplies" draws attention to the neglect of drainage in surface irrigation works, its deleterious consequences in the shape of waterlogging and soil salinity and finally the loss in crop yield. His graph on p. 271 highlights the precipitous fall in crop yield once the groundwater table rises upto one metre within the surface. While he explores the returns to investments in horizontal drainage, there is no mention of developing vertical drainage by so designing surface irrigation works that the farmers are induced to invest in their own wells. Finally, Part 2 concludes with a paper by M. D. Skold and D. W. Lybecker, who explore the problem of on-farm water management with the aid of the Egyptian data.

Jack Keller thinks that the root cause of below-expectation performance of major irrigation projects is the conflict between private and social gains, namely, an individual farmer trying to maximise output per unit of his *land*, and not per unit of *water* that may maximise total output of the society. In the next paper, Warren Fairchild and K. C. Nobe give an in-depth analysis of their attempt to apply modern theory of irrigation management to a concrete case in Pakistan. Next, David Seckler offers a very provocative exploration of managing irrigation systems for paddy, the main user of irrigation in India. He questions the wisdom of introducing 'warabandi' and field-to-field irrigation for mono paddy cultures. The empirical basis of his perception for a basic difference in the yield-water relationship for paddy vis-a-vis other crops needs verification. Max K. Lowdermilk examines the case for involving farmers in the management of irrigation works. Legal and institutional aspects of irrigation water management are critically examined by George Radosevich. A fundamental institutional issue for irrigation develop-

ment in the Asian region, according to Walter Coward, Jr., involves finding the appropriate mix that will differ from place to place.

The book is bound to be useful to the researchers and as teaching aid in water and land management institutes that are being established for each State in this country.

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Technology, Credit and Indebtedness in Marine Fishing: A Case Study of Three Fishing Villages in South Kerala, Jean-Philippe Plattean, José Murickan and Etienne Delbar, Hindustan Publishing Corporation (India), Delhi-7, 1985. Pp. xxii+406. Rs. 150.00.

Marine fisheries sector holds a very significant place in the Indian economy. It is a major source of livelihood for several thousands of traditional fishermen and others. The two very important inputs essential to these fishermen, if they were to exploit this source of livelihood effectively, are finance and technology. There is also a very strong linkage between these two inputs. For instance, finance is essential for technological upgradation, and technological upgradation can lead to better financial prospects. Once this linkage is accepted, it is important to understand the impact of these two inputs on each other. The book under review is a pointer in this direction. It brings forth the salient features of this finance-technology linkage.

The objectives of the study as stated by the authors are to understand the credit system prevalent, and how the system varies according to the level of fishing technology, on the one hand, and to determine the indebtedness of these fishermen and how it varies according to the level of their fishing technology. The credit system in the fisheries sector is also linked closely to the socio-economic and political systems in the region. This has been brought out clearly by the authors right at the beginning; and then methodological choice rightly follows this characteristic pattern. In order to assess the impact of mechanisation on the level of indebtedness of the fishermen and the characteristics of the credit system, the authors have selected three fishing villages in south Kerala, and have undertaken in-depth case studies.

The findings of the study are presented in five chapters. A general description of the three villages in the context of Kerala's fishing economy is given in Chapter 1. Chapters 2 to 4 present the in-depth case study of the three villages examining the main features of the credit system as it operates in the respective communities. Chapter 5 compares the salient features of the three communities together and also offers suggestions, and policy implications are indicated. This is supplemented by a number of tables and illustrations, thus ensuring adequate coverage.

Some of the important conclusions of this study are: (a) in traditional fishing villages credit, labour and marketing relations are often interlocked in a way that restricts the economic freedom of debtors and (b) the structure of interest rate is far from being uniform across the three villages. The authors further point out that the situation obtaining in the fisheries sector resembles the one currently observed in the agricultural sector, *i.e.*, the people with largest asset base are those who benefit most.

The findings of the study are a valuable contribution to the policy makers. Though the study is quite exhaustive backed up by lot of statistical data, it would have been more insightful if the authors had segregated the sample as small, medium and large fishermen groups so as to pinpoint who are the real beneficiaries. Similarly, the borrowings could have been examined to determine the technology level and financial requirements and therefore indebtedness separately for individual requirements of finance (such as for gears, nets, etc.) and financial requirements for infrastructure development.

It is expected that the publication would stimulate interest among policy makers and the academic community to undertake more such studies for the development of the marine fisheries sector.

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Intensification of Agriculture: A Study in the Plains of Uttar Pradesh, Susanta K. Ray, Institute of Economic Growth, Hindustan Publishing Corporation (India), Delhi-7, 1985. Pp. xii + 138. Rs. 65.00.

Output expansion can be visualised broadly in two ways. One, through extension of cultivated area and two, by expanding productivity of a given land base. The first option has indeed limited scope for adoption in a densely populated agricultural region, partly because a very high proportion of cultivable land is already under the plough and partly because of steadily increasing pressure on rural lands for non-agricultural purposes. In a country such as India, raising land productivity is, therefore, the only enduring basis for continuous expansion of agricultural output. For achieving productivity expansion, production has to be organised on intensive lines, manifestly through substitution of labour, capital and farming skills for land. The bottleneck of 'land scarcity' is to be overcome through steady increases in cropping intensity. The multiple cropping index can be pushed up through cultivation of more and more of irrigated areas, and is sustained through rising labour-land and/or capital-land ratios. The policy options are indeed clear although difficult for areas which are late in providing land and other infrastructures for intensification of their agriculture. The book under review is a nice attempt to look into (or perhaps the lack of) the process of intensification in the agriculture of Uttar Pradesh.

The book runs into six chapters. Chapter 1 briefly explains the meaning of intensification and its importance for a developing agricultural economy. Chapter 2 provides the framework for analysis. The crucial components for the study of intensification are (NCA/CA) , $(\sum a_j d_j / NCA \text{ or } HM/NCA)$, $(O/\sum a_j d_j \text{ or } O/HM)$ where O is output, NCA is net cultivated area, a_j is area under j th crop, d_j is the time duration (in months) for the cultivation of j th crop so that $(\sum a_j d_j)$ is the total of hectare-months (HM). Assuming that production of any single crop does not require more than 12 months of land use (Table 1, p. 15), it follows that $0 < d_j \leq 12$ and the value of (HM/NCA) ranges generally between 6 and 11 (Appendix Table A-1, pp. 108-111).

The expression (HM/NCA) is the total duration of cropping activities during the year and the author chooses to call it 'hectare-months of cropping activities per hectare of net cultivated area'—perhaps a circuitous but avoidable jargon. It could be easily designated as 'weighted cropping intensity' (with number of cropping months occupied by individual crops acting as the weights) against (GCA/NCA) being the 'unweighted cropping intensity' (GCA is gross cropped area; time-variation here is seen only in terms of the two cropping seasons). It is interesting to see that $(HM/NCA) = (GCA/NCA) \times (HM/GCA)$ so that the 'weighted index of multiple cropping' (LHS expression) is the product of 'simple, unweighted cropping intensity index' and the 'average time duration of crops grown'. The technical jargon notwithstanding, the role of physical environment, water availability and its regulated flow, sheer labour supply under demographic pressures, etc., in influencing the elements of intensification are nicely explained (pp. 9-12).

Chapter 3 is full of useful information on the pattern of intensification among the 46 districts in the plains of Uttar Pradesh, based on the 1971 population and agricultural census data. The districts are notionally divided into three levels of land productivity: high, medium and low. Then, cross tabulations are given to reveal the relationships between the proportion of cultivable area under plough (NCA/CA) and 'weighted cropping intensity' (HM/NCA) (Table 2, p. 18), between 'weighted index of cropping intensity' (HM/NCA) and its 'unweighted' counterpart (GCA/NCA) (Table 3, p. 20), between 'cropping intensity level' (HM/NCA) and output per hectare-month of cropping intensity' (O/HM) (Table 4, p. 22), and so on. It is useful to look at these tables carefully and comprehend the underlying relationships discussed in the text. In particular, the contents of Table 2 (p. 18) attract much attention inasmuch as in 38 out of 46 districts included in the study, the net cultivated area as a proportion of total cultivable area exceeded 90 per cent in 1971; for some districts, e.g., Saharanpur, Rampur, Azamgarh, Varanasi, Gazipur, Agra and Jalaun, it was more than 96 per cent. Clearly, it is a reflection of intense population pressure and the operation of the Ricar-

dian phenomenon. Again, Table 3 clearly conveys an extreme degree of concord between the unweighted and the weighted levels of cropping intensity; in the low productivity districts, the correlation between the two is as high as 0.96 while in the medium productivity districts it is 0.85. If one were to apply some statistical test, one might discover that these correlation coefficients are not significantly different from one. In that case, the distinction between weighted and unweighted cropping intensity appears an academic exercise; stretching out cropping activity period from 'seasons' to 'number of months'.

Chapter 4 ventures to identify the forces boosting up the process of intensification in each of the three groups of districts. A comprehensive list of variables is given on p. 37; the equation-specifications are spelt out on pp. 39-40 and a number of double-log estimated functions are set out in Tables 9 through 13. It may be less than fair to discuss these equations in the brief space available for the review; let the serious reader read and comprehend for himself the underlying nuances of each equation; the text is highly readable. Some of the main conclusions are as follows. Firstly, "in the high productivity group [of districts] extension in the duration of cropping activities per hectare of net cultivated area was obtained more through use of tractors than through use of human labour, and through cultivation of long duration crops in larger holdings than through multiple cropping of short duration crops in smaller holdings" (pp. 45-46). In contrast, "in the low productivity group, an extension in the duration of cropping activities per hectare of net cultivated area was carried out with human labour mainly through the cultivation of short duration crops under rainfed conditions and/or assured supply of water from tubewells. Canal irrigation facilities, concentrated more in the low rainfall districts of this group, appeared to be less dependable for multiple cropping, and irrigated multiple cropping was yet to assume importance in the intensification of land use" (p. 46). Secondly, "diversification of rural occupation pattern during the period (?) remained very limited, and most of the rural workers continued to rely on crop production activities for their livelihood" (p. 33). Thirdly, "though non-crop producing activities in rural areas were significantly absorbing a part of the rural work force, their contributions were overwhelmingly negated by the supply of workers determined by rural population density, and displacement of workers caused by tractorization and cultivation of long duration crops" (p. 60). Incidentally, in some of the estimated equations, the alternating signs of the same regression coefficient when one moves from high to medium to low productivity districts are a puzzle which is not explained satisfactorily. Also, the significance symbols for some estimators are missing.

Chapter 5 is a very important part of the book. It looks at the changes in a number of variables between 1971 and 1977. Some useful information about the evolution of the new production technology in the general Indian context is set out on pp. 62-68, followed by a reasonably good discussion on the diffusion of new technology in Uttar Pradesh (pp. 72-79). The changes in some of the variables pose uneasy reading, the most conspicuous being the decline in the value of output per crop producing rural worker (O/

CRW) in all the four regions of Uttar Pradesh. This decline can be explained, on the one hand, by a sluggish increase in output per hectare of net cultivated area and, on the other, through a fairly high increase in man-land ratio. Appendix Table A-5 (pp. 126-129) provides sufficient hints in this regard. For example, in 16 out of 18 districts of the Western Region, in all districts of both Central and Bundelkhand Regions and in 13 out of 15 districts of East Uttar Pradesh, the growth rate of (O/NCA) was lower or much lower than that of (CRW/NCA) during the period 1971-77. This poses serious policy problems. The author is, therefore, right in concluding that the "forces for intensification in agricultural development and rural employment, which we had hoped would have been accelerated by the new technology, could not gather sufficient momentum in the plains of U.P. even a decade after its introduction. Sugarcane cultivation continued to play the pivotal role in determining the districts' productivity levels. The new technology has made little contribution to accelerating the crop output growth rate in U.P. Inter-regional and inter-personal disparities seem to have widened further, though inter-district disparity within each of the relatively homogeneous ecological regions is now showing a tendency to decline. Undoubtedly, the high yielding varieties of seeds have now received wide acceptance in the plains of U.P. But, they are cultivated without the proper combination of other practices which go as a 'package' for the cultivation of these varieties. Development of a modern land infrastructure system encompassing irrigation, flood control, drainage, reorganization of land holdings, etc.—which is a pre-condition for adopting and realizing the full potential of high yielding varieties of seeds — has not received adequate emphasis. As a result, the duration of cropping activities has changed little, and yield per hectare-month of cropping activities has increased marginally. The scope for accelerating the crop output growth rate by the new seed varieties has thus remained mostly untapped in the plains of U.P."

A few important suggestions are offered by the author in Chapter 6. In particular, the suggestions on structural reorganisation of holdings including consolidation of holdings, irrigation and drainage improvement need to be pursued with a sense of urgency.

In sum, the book provides enough insight about the rather tardy growth of Uttar Pradesh agriculture till about the mid-seventies. One may discover many significant changes in the situation during the post-1977 years, especially because agriculture in Eastern Uttar Pradesh is reported to have started doing well. There is thus a need to update such regional growth profiles.

Before concluding, a few minor points may be made. Firstly, the author has over-emphasised the fact of internal homogeneity of the three clusters of districts. Clustering of districts on the basis of land productivity levels is not the same thing as their being similar in a soil-climatic-cropping mix sense. Secondly, it is bad statistics to compute coefficient of variation on as few as four observations (only four districts in Bundelkhand Region, refer to tables in Chapter 5). Thirdly, the author, like most of us, could not avoid 'academic excitement' inasmuch as the text is punctuated by statements which are

clearly beyond the ambit of data looked into. Lastly, in Chapter 5, the disparate picture on disparities in land productivity (i) among districts in each of the regions, (ii) among the four regions, and (iii) among all the 46 districts taken together, could not be reconciled. These are indeed minor points and do not reflect on the quality of the study which is both rich and exciting.

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Technology, Human Capital, and the World Food Problem, Edited by G. Edward Schuh, Alexander von Humboldt Award Colloquium, 1984, Institute of Agriculture, Forestry and Home Economics, Department of Agricultural and Applied Economics, Agricultural Experiment Station, Miscellaneous Publication 37—1986, University of Minnesota, St. Paul, Minnesota, U.S.A., 1986. Pp. x+167.

The present volume containing six contributions has been brought out to honour Prof. Vernon Ruttan. Ruttan's research contributions span over more than three and half decades. Some of the contributions of Ruttan have made notable impact on professional thinking. One such contribution was on induced technological innovation. Technology is neither given nor an exogenous factor changing independently. His analysis of international data showed that forces which influenced farm production through economic returns influenced also the level of technology. Traditional agriculture would stand still if the factor endowment is maintained by other forces—say famine, war, adjusting population to other factors, etc. The history of agriculture traversing from jhum to settled agriculture and irrigated and continuous farming bears witness to induced innovations. Ruttan extended his theory and later showed through empirical research that institutional innovations, like technological innovations, are endogenous to the system of equilibrating forces.

Contributors to this volume include authors of outstanding repute. Among them are T.W. Schultz, Robert Evenson, Hans Binswanger, and topics covered represent various fields like education, technological research and demography. There is a common thread running through them. They deal with apparently non-market behaviour of public or private good. Their analysis shows that the behaviour is influenced by market forces as understood in a wider sense of maximisation of gain. In this respect, the views represent a school of thought. An able summary at the end by D. Gale Johnson brings out the theme that links the contributions on diverse topics.

Some of the findings are noteworthy. We shall only briefly mention a few. Evenson observes that research and extension services have a high 'price' (cost) elasticity, the lower the cost of providing these services the greater the utilisation of services of extension workers, etc. 'Surplus' maximisation is taken as the objective of the planner. The non-economic

factors like political system is also included as a variable. Binswanger and Prabhu L. Pingali have tried to identify the stages of transition in the use of implements from hand tools to animal-driven leading to increased farming intensity. Tracing over the farming system transition from forest fallow to multiple cropping, they identify the stages of transition. T. W. Schultz demonstrates that "a decline in price of food improves the economic lot of the poor." This observation is to be viewed in the context of a decline in the production costs. Improving the lot of the poor leads to reduction or disappearance of intra-family consumption distribution. Improvement of the lot of the poor through improved share of labour relative to that of the property leads to improved income, reduced share of expenses on food which in turn helps improvement of welfare of individual members, and reduced inequality in the personal income distribution. The logic underneath would need careful interpretation and understanding of the process of interaction of technology, production, prices and social attitude.

T. Paul Schultz has tried a difficult exercise of explaining public expenditure on education by the influence of changing private demand for education. Voters, election, tax burden, etc., are his variables. Relative price of a primary teacher to per adult GNP is the cost variable. The cost he has defined has universally declined, in other words, teachers' productivity seems to have increased.

The wide span of coverage of topics and sophisticated method of analysis make the volume rich in contributions. The underlying thread leads to a major observation: the decisions by the state which only seem to be independent of the market forces are in reality not. The influence exercised by market forces may be complex, devious and through a long route. It can however be perceived. The non-economic behaviour of the family in so far as welfare of individual members is concerned, is also not impervious to economic growth phenomena. Similarly, use of technology and services of extension are all influenced by associated costs. The findings have major policy implications.

Ruttan's theory relating to induced institutional innovation illustrated through changes in property rights, traditions regarding reward to labour and evaluation of public organisations for research, extension, etc., provides a broader base to view the role of policy makers. Flow of knowledge generated by social science disciplines is a help in making the role of policy makers more meaningful rather than ad hoc. We would find in his analysis that human behaviour has a common basic element which cuts across complexities. Guiding and adjusting social actions to this common element would be beneficial to all in the society. Such an approach to economic problems is comforting in the long run.

Taxation and Agricultural Development in India, C. H. Shah, Himalaya Publishing House, Bombay-4, 1986. Pp. x+118. Rs. 90.00.

In the course of planned development of the economy, the public sector always finds itself against severe shortages of resources to finance the various programmes for development. These shortages become all the more acute and grave in the face of inefficiencies of varying degree as seen in the functioning of its own undertakings. Most often the reliance on deficit financing and the degree of inefficiency of the public sector undertakings seem to be very closely correlated. Since the agricultural sector is a dominant sector in the economy, it is but natural that it receives a dominant share in the overall resources of the economy for its own development. This also depends upon the priority that is to be assigned to agriculture vs. industry in the course of planned economic development. Obviously, the development of these two sectors needs to be appropriately balanced in the course of overall economic development. As a corollary of this, it also follows that the agricultural sector should also contribute to the generation of resources in the economy not only for its own development but also for the development of the other sectors. It is in this context that taxation of the agricultural sector assumes a crucial significance in developing countries.

The book under review is one of the closely argued-out studies of the problems of taxation of the agricultural sector in India. Consisting of six chapters and with a useful bibliography on the subject given in the end, the study brings together all the major arguments in connection with the taxation of the agricultural sector for the purpose of development of the economy as a whole and of the agricultural sector in particular. Being a noted authority himself in the field of agricultural economics, the author has brought to bear on the analysis of the problem his long research experience and mature outlook. Since the important analytical studies on the subject have been subjected to a very close scrutiny by the author, the value of the study has increased all the more.

In Chapter 1, the author has outlined the problem of taxing agriculture by presenting certain propositions relating to the elasticity of agricultural taxation, technological base of agriculture and its taxable capacity, the structure of taxation for mobilisation of resources from the agricultural sector, etc. The author also has dwelt at length on the case of Japan which is normally cited to suggest that taxation of the agricultural sector need not necessarily be counter-productive so far as development of the economy as a whole is concerned. He convincingly argues that the case of Japan is not strictly comparable with the presently developing economies in view of many favourable forces operating in the former.

In Chapter 2, the author has examined taxation and government expenditures in general in the course of changing structure and character of the

economy. There is a good analysis of the trends of the revenue sources and government expenditures. This is followed by an analysis of the role of agriculture in economic development in the Indian context and also resource transfer from and to agriculture in the course of economic development. After this macro setting, the study moves to a detailed examination of tax on agricultural sector in Chapter 3. Direct and indirect taxes on agricultural sector including land revenue, agricultural income-tax and other taxes have been examined. The appendix to this chapter attempts to link the incidence of land revenue on agricultural income and share of agriculture in State Domestic Product (SDP). The results of the statistical exercises suggest that the States with higher share of agriculture in SDP do not levy higher tax on agriculture by way of land revenue. It is also revealed that as importance to agriculture declines despite higher tax incidence, total revenue collection from agriculture would tend to decline. Though these conclusions seem to be interesting in themselves, one is not sure whether the attempted statistical exercises would be sufficient enough to draw the conclusions.

In Chapter 4 of the study, the author attempts a detailed analysis of the indirect tax burden on the agricultural sector in particular. There is a good summary of the major contributions to this field contained in individual studies and also the reports of the government committees. The chapter also contains an interesting analysis of inter-sectoral resource flows which refer to both tax and State expenditure and also concealed tax and concealed subsidy and redirection of institutional finances. Consideration of these concealed instruments of resource transfer and also the role that the institutional finance has played in the resource flows has added new direction to the analysis of net fiscal burden on the agricultural sector. Obviously, the reader would find this chapter to be of utmost interest for its depth of analysis. On the basis of the detailed study of the aspects, the author concludes that there is little evidence suggesting that transfer of resources from the government is in excess of taxes collected from agriculture. This is an unconventional conclusion which is different from the one which is normally argued out in debates on tax burden on Indian agriculture. The keen analysis of the large amount of facts and figures, presented here, coupled with a meticulous examination of the other studies in the field, induces the reader at least to ponder over the generally argued-out conclusion.

Chapter 5 of the study deals with subsidies for the agricultural sector. In particular, there is a detailed discussion of input and product subsidies, especially the fertiliser subsidies, foodgrain subsidies and other subsidies. This chapter concludes with a brief analysis of these subsidies in the case of Gujarat. On the basis of the general analysis and the experience of Gujarat, the author concludes that the policy with regard to subsidies does not seem to have been effective from the point of view of their objective of equity and desirable incentive effects. It is a pity that the Committee on Controls and Subsidies which attempted to examine some of these aspects in the context of the Indian economy as a whole does not seem to have received adequate attention at the hands of the policy makers in the subsequent period.

The last chapter on "Problem and Policy Implications" has brought together the major observations made in the preceding chapters.

On the whole, the study can be considered to be a valuable addition to the existing literature on the problem of taxation of the agricultural sector. The unique feature of this study is a broader framework of resource withdrawal and resource inflow, so far as the agricultural sector is concerned. Obviously, it is this broader approach which helps in objectively assessing the role of taxation of agriculture and of agriculture in economic development.

It is but appropriate that this study, which was conducted by the author for FAO, has been dedicated to Professor M. L. Dantwala, whose incisive analytical insights over several decades have provided a firm basis for our understanding of the Indian agriculture and that it also includes a Foreword by Professor D. T. Lakdawala, an eminent authority on Public Finance.

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New Farm Technology and Income Distribution, M. Sebastian Stanislaus S. J., Ashish Publishing House, New Delhi-26, 1984. Pp. viii+76. Rs. 65.00.

The book under review is one more addition to the wealth of literature on effects of new farm technology on income distribution. The study pertains to Thiruchirapalli district of Tamil Nadu State. The impact of new farm technology is studied both for farm households and non-farm households during the period 1975-76 to 1978-79 for the former and during 1978-79 only for the latter. It contains four chapters.

Chapter I provides an insight into the background of the selected topic along with the objectives, sources of data and sampling design of the study. But the selection procedure for agricultural labour is missing. The objectives of this study are: (1) to study and compare the size distribution of income of rural households in Thiruchirapalli district under the Intensive Agricultural Area Programme and High Yielding Varieties Programme for the years 1975-76 to 1978-79, (2) to isolate and measure the impact of new technology on the distribution of income among farm households in the district and (3) to study the net impact of new technology on the levels and distribution of income of non-agricultural households and agricultural labour in the district.

Chapter II contains the method of data collection and analytical tools employed to achieve the set objectives. The author's effort particularly the critical review of analytical tools of inequality, measures is commendable. But the particulars like selection of farmers, sources of data, etc., should have been presented in this chapter instead of including them in the introductory chapter.

Chapter III deals with the discussion of the results of the study. As stated by the author himself, the dissimilarity of the sampled farmers for the four years is an accepted lacuna of the study. The author has indicated in this chapter that the sample of 250 farmers is divided into 20 size-groups. In fact, it should have been stated in Chapter II. The details of distribution of farm households by size of farms and their mean income per annum are presented in Tables 1 to 4. Through Lorenz curve and Gini concentration ratio, the author proves that the increased spread of technology during the period of study has aggravated the income inequalities among the farm households. A point which is not clear is that the Gini concentration ratios for the four years are worked out through four groupings while for Lorenz curve only one grouping is followed as only one curve per agricultural year could be used. Another sudden and abrupt inference of the author is that non-farm households have lower Gini ratio than farm households in 1978-79, implying that the farm households suffer from more severe income inequalities than the non-farm households. The distribution of income for non-farm households is not presented either through a table or Lorenz curve preceding the statement. In fact, as per his objectives it should have been given while presenting the results of the third objective. The results of the Gini concentration ratios are also supplemented with probit analysis. While discussing the distribution of area under the high-yielding varieties particularly to indicate that the same is increasing over the period, the tabular presentation of the data also would have been more useful. Discriminant analysis is used for confirming the classification of farmers into progressive and less progressive. The third objective which is aimed at measuring the net impact of new technology on the distribution of income of the non-agricultural rural households and agricultural labour is superfluous, because the case of non-agricultural rural households is already presented under the results of the first objective and the analysis with regard to agricultural labour is ignored totally.

Chapter IV presents the summary, conclusions and policy implications of the study. The summary of the findings listed under the third objective is not found in Chapter III. Chapter IV is followed by appendix, bibliography and index.

Though the study has not fully achieved all the objectives set forth, it is an important and useful addition to the literature. At the end, the author has highlighted the possible measures which can be taken up to reduce the income inequalities associated with technology wherever they exist.

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Spatial Dimensions of Indian Agriculture, Edited by Dalip S. Swamy, Agricole Publishing Academy, New Delhi-24, 1986. Pp. viii+122. Rs. 100.00.

The book under review is a compilation of a few technical papers presented at the Third Annual Conference of the Society for the Study of Regional Disparities held at Bhopal in 1982. The conference addressed to two aspects of regional disparities in the rural areas. These were: (i) development of rural industries and proletarianisation of rural households, and (ii) impact of institutional credit on growth and inequalities of income.

The book consists of seven chapters. The first chapter, written by the editor himself, begins with an overview that summarises the entire book. The editor tries to relate the gist of the technical papers and the general consensus of the conference. Instead of this, a well documented recommendations of the conference would have helped the readers in formulating future research priorities and policy decisions.

The second chapter on "Spatial Dimensions of Rural Employment in Household Industries in Madhya Pradesh" by A. C. Minocha presents the growth of employment in household industries, which are predominantly rural in character. The analysis, based on the 1971 and 1981 Census, reveals that despite great emphasis on development of rural industries, the occupational pattern and diversification of rural economy of the State have not witnessed a marked shift. However, Damoh, Sagar and Satna districts showed an impressive increase in household workers due to the presence of *bidi* industry. Overall, the agricultural as well as industrial performance of the State was very depressing during the study period.

The third chapter presents a highly cogent discussion on "Immiserisation and Proletarianisation of Peasantry in India" by Dalip S. Swamy. The study estimates the rate of immiserisation and proletarianisation due to demographic and non-demographic pressures in rural India. It notes that the population pressure has the effects of shifting the peasantry to lower levels of ownership holdings as well as converting them into agricultural labourers (p. 28). In an interesting analysis, the total changes in households have been decomposed into changes due to demographic and non-demographic factors during 1961-71. It is estimated that over the decade 2.54 per cent of the total land owning households were converted into agricultural labourers. The contribution of demographic factors to the proletarianisation is 1.34 per cent, and of non-demographic factors 1.20 per cent. Despite the limitation of data, which the author points out, the study is a valuable contribution.

The next chapter deals with the "Institutional Change in Agricultural Credit, Economic Growth and Inequality: An Inter-State Analysis" by Ravindra H. Dholakia. The author examines the implicit assumptions behind government policy that institutional change in agricultural credit can bring forth significant change in terms of economic growth and reduction in inequalities in India. The author argues that mere changes in institutional credit are of no significance for raising the rate of growth or reducing inequalities. The institutional changes must be supplemented by the technological factors to

attain optimum results. The methodological framework of the chapter is weak and needs improvement in developing the basic model as well as regression analysis.

The fifth chapter on "Determinants of Regional Distribution of Institutional Credit to Agriculture—A Study of Karnataka" by R. V. Dadibhavi shows the presence of high disparity in the institutional finance to agriculture during 1975-76. With the help of regression analysis, it is concluded that agricultural advances by institutional agencies in general, and commercial banks in particular, are concentrated in districts with relatively higher level of agricultural development, literacy, resource endowments and urbanisation.

The chapter on "The Weaker Sections and Development of Banking Since Nationalisation" by V. G. Rao and S. Chandrasekhar points out that despite the stated objectives of commercial banks of promoting development of backward regions and weaker sections, the rural branches of nationalised banks have functioned more as deposit mobilisers than as development instruments.

The last chapter by R. C. Gupta and D. Bandopadhyay describes the inter-regional disparities in fertiliser consumption in India and the role of fertiliser supplying agencies in removing such disparities. It reveals that despite high growth in fertiliser consumption, large spatial variability is observed. About 30 per cent of the total number of districts (384) accounts for as much as 70 per cent of the total fertiliser consumption in the country (p.108). The small and marginal farmers are unable to use optimum quantity of fertiliser, irrigation and so on. The fertiliser supplying agencies are playing an important role in the transfer of technology from research laboratories to the farmers' fields. Such potential of these agencies should be fully utilised by the government to promote resource use and augment agricultural production in the country.

The title of the book under review is very attractive and interesting. The reader of this book expects much more than what it provides and he expects that it would deal with the spatial dimensions in agricultural production, resource utilisation, land reform, technological change, agricultural marketing labour employment, institutional changes, etc. On the whole, the book is a good addition to the literature on regional disparity.

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Tenancy and Efficiency of Farming in a Developing Economy, R. N. Tripathy, Mittal Publications, Delhi-35, 1985. Pp. xv+192. Rs. 140.00.

The system of land tenancy—daughter of necessity and mother of misery—had been denounced since long for low efficiency in agriculture. The recent debate during the last twenty years and some of the findings that tenancy is no less efficient than owner farming prompted the author to look at it afresh objec-

tively with primary data at micro level. Much of the discussion had been in neo-classical tradition and a historical including the present one. The author deals with the overview of the literature very nicely and quantitative technique with herculean effort.

The author completes the infrastructure of the analysis in the first three chapters and finds in Chapter 4 that 89.29 per cent of the cultivated area, 54 per cent of farms and 73.13 per cent of the operated area belong to large farms. Thus the analysis is more relevant for large farms while the percentage of total operated area under tenancy is the highest (55 per cent) in the lowest size-group (p. 77). In the classification usufruct mortgage of land is a more appropriate term than tenancy where the landowner takes loan and usufruct mortgages out land to get rid of the burden of interest. In type 'B' is the landlord required to bear one-third of the labour cost, a variable cost? (p. 37). The author should be more specific. The resource position of own farm is better than tenant farm. Under such circumstances if the tenant farm is less efficient than own farm, then it is just a truism. Cropping pattern, its intensity and canal irrigation facilities are more the consequences of demonstration effect and group behaviour than the decision of the individual farmer as a tenant or as an owner. The author himself finds lack of systematic pattern (p. 75). *Ragi*, a coarse grain, has the highest percentage of area under tenancy in all size-groups (p. 78). It implies low priority to tenant farm in utilising HYV seeds of fine grains. Owner farmers have better utilisation of resources and also higher number of labour days per hectare while tenants are expected to be more resourceful from the point of view of labour supply. Does it imply that the tenants have to supply labour power first on landlord's farms, a feature of feudalism. This aspect has been overlooked and the author explains this in terms of shirking of tenants and hiring out their human and labour power on others' field for payment. If the tenant gives less priority to tenanted land, why does he use more doses of manure on such land? If he uses lower doses of chemical fertiliser, it is the resource position and not the form of land system that explains the difference. Similarly, differences in the pattern of capital use particularly of working capital have not been explained in terms of tenancy. The author finds that share rent and fixed rent tenancy are almost on equal footing. But this requires a careful analysis as there is a large volume of literature which argues in favour of fixed rent as compared to share rent tenancy. He has also analysed the factors contributing to productivity difference. But it would have been more appropriate to isolate these factors and explain the difference in terms of tenant and own farms. The author deserves praise for his attempt to calculate marginal productivities of different inputs, a complex issue. However, the calculation remains sketchy and incomplete. Any conclusion drawn from this is not without risk.

Lastly, the author concludes that tenant farms are on lower footing than own farms in the matter of utilisation of resources and productivity. But the conclusions would have been more conclusive had the analysis concentrated in the following directions:

- (a) A comparison is made between fully tenanted farms and fully owned farms; and owned plot and tenanted plot of the same farmer.
- (b) Three years' average analysis is more appropriate than two-year comparison in view of cyclical character of agricultural production.
- (c) Calculation of bullock and implements cost on the operation value of the particular crop and not on the capital value as they are also hired out like human labour in the agrarian economy.
- (d) Inclusion of supervisory and managerial cost in the total cost.

However, in spite of overlooking the role of politics and socio-economic power, limiting the analysis to only utilisation of existing resources and not to development of resources and being only descriptive, the book fills a void and is a welcome addition to the literature not only on tenancy but also on calculation of cost of agricultural production.

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