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BOOK REVIEWS

Information Systems for Agriculture, Edited by M. J. Blackie and J. B. Dent, Applied Science Publishers Ltd., London, 1979. Pp. xii + 176. £ 13.75.

The book under review deals competently with a newly developing branch of agricultural economics. Eight chapters contributed by eleven eminent scholars in the field deal with several important issues.

Economists' skill permitted them to deal with conceptual problems, problems of measurement and behavioural analysis. This skill carried them not much farther in their assigned task of helping directly in decision-making. The field of information systems and its allied branch, *viz.*, systems analysis, both newly developing areas, help the economist a great deal in fulfilling their primary assignment. The chapters in this book demonstrate how this task is performed.

Decision-making in agriculture can be at farmers' level, at intermediate levels like trading, loan giving and at the State level. In the post-war period the use of linear programming facilitated providing help to the individual producer in decision-making. In the absence of a regular information system, the benefit of linear programming to the agricultural sector did not extend much beyond demonstration and occasionally group decisions.

Information is distinguished from data in the context of the information system. Only processed data are information. Processing of data has to be linked with conceptual framework and the latter with a neat theory, on the one hand, and with objectives of the decision-making in the system, on the other. To illustrate, a producer is interested in projected rather than the past prices. Projection can be done on the basis of demand-supply framework.

Thus data, interpretation and their processing and the decision-makers are the integral parts of an information system. Different systems may be evolved as the components of the systems change. The data base, behavioural analysis and the related theoretical frame and the skill, keenness and objectives of the decision-makers may change over a period.

The above sums up the main contribution of the chapters in the book under review. The book provides a clear exposition of information systems organization, objectives and functioning. It also deals with the issues related to operation of the information systems in agriculture. Three major issues dealt prominently are: (*i*) Is the information system beneficial to individual farmers? Does it pay them to buy information? (*ii*) To what extent State intervention in affecting the demand for and supply of information for agriculture is necessary? (*iii*) Is the information system organization relevant for developing economies?

The pioneering article of Stiglers[1] in 1967 aroused interest in information as an economic commodity. Its main argument was that supply of information will reduce space dispersal of prices. This benefit can be had at a cost. Between

1. George J. Stigler, "The Economics of Information", *The Journal of Political Economy*, Vol. LXIX, No. 3, June 1961.

1961 and 1970, the computer technology made rapid progress. The progress was especially striking thereafter, the introduction of micro computers and the terminals revolutionised the computation technique, resulting in a steep reduction in the cost.

We have mentioned that in the context of the information system, information is redefined to mean processing of data in such a manner that the findings would help decision-making. At the individual farmer's level, besides prices, information on farm management and on biological aspects of production can be directly beneficial. If a large dairy farmer can monitor information on individual animal, he can improve the efficiency of feeding programme markedly; the gain resulting from it can be as great as or greater than the technological improvement through breeding programmes. Similar instances of technological efficiency improvement can be found in regard to crop production, particularly regarding use of fertilizers, irrigation resources and pesticides. Efficient allocation of production resources to alternative uses can be ensured by the use of linear programming package, the latter can be even a bankable proposition.

At the individual farmer's level the problem of acquiring and retaining information within the enterprise becomes crucial. Programming firms equipped with research information can provide the know-how at a price. If the benefit of this leaks out to firms that do not buy the know-how, the supplying firm would lose revenue. The farm-firm's advantage also will be reduced. To this problem a solution suggested is based on group theory. The individual farmer would join a group to buy the know-how which he expects to benefit if the expected benefit is greater than the fees. Such organizations came up on a large scale in U.K., Canada and U.S.A.

Traditionally, the state in most countries collects data regarding farm production and prices. The state can organize the information system in a manner that would reduce spatial dispersal of prices, help farmers to respond to long-term production planning, and organize short-term sale programmes. State information system can help extension organization by monitoring research more meaningfully, can help improve efficiency of the use of irrigation water by monitoring weather data. By predicting ahead of time the onset of pest and diseases the state can promote effective prophylactic use of chemicals and thus help protect crops against losses.

The book under review does refer to the scope of improved agricultural information system in the less developed countries (LDCs). As the book has a focus on recent developments in the information system, the discussion regarding LDC is limited. Increased attention is being paid, of late, to LDCs in the context of information system. Recent contribution of Joy[2] dwells on information system in regard to nutrition programme. Since the hypothesis of Joy regarding the trend in poverty is based on what he calls 'a displacement theory'—loss of land by small owners in the rural areas caused by increasing demographic pressure,—the information system paradigm developed by him covers land owner-

2. Leonard Joy, "The Segments of the World Population at Nutritional Risk", *American Journal of Agricultural Economics*, Vol. 61, No. 5, December 1979.

ship system, demographic system, resource use in agriculture and farm finance. It is known that many LDCs have embarked on planning of the economy with institutional reforms as an integral part of it. The laws enacted in connection with land reforms, for instance, would require more detailed information about changes in the land ownership and land tenure pattern on a continuing basis than is available from records for both effective implementation and concurrent monitoring of the trends and their causes. The need for information system is equally pressing for intervention in product markets, arranging the supply of foods to meet scarcity conditions, food for work programmes, etc. Originally farmer-level information system was developed in the western countries by banks. Expanding credit needs for farm sectors emphasize a need for similar arrangement in LDCs. In India, not long ago, farm level budgeting exercises were undertaken in selected Intensive Agricultural District Programme centres on a massive scale. Had there been an efficient information system the fate of the programme would have been different from the one experienced then. In particular, the book refers to Mexico among LDCs. Corn forecasting module saved US $ 8.2 million in corn distribution cost in one year, 1973-74 (p. 85).

The book discusses the technical details relating to the use of terminals and micro computer facilities. The authors caution against the over-use of the facility because of easy and cheaper access to computers. The computer facilities have helped rapid development of information systems. Two issues relating to impact of the information systems raised in the book are: (1) Will the use of computer facilities for the information system widen the income inequality? (2) How to cope up with the rapid obsolescence of the concepts used in data collection?

Good example of possible increased inequality from improved information system is provided by the fact that information on prices will be acquired and used beneficially by the traders and big farmers. At the same time better research information with the extension agent and on weather to the irrigation authorities can benefit small farmers who in the absence of such information would be the worst sufferers.

Inadequate price information system may result in trade cartel or vertical integration. Lack of information on labour demand on different locations may result in low migration and increased mechanization.

Thus the book under review provides not only a clear exposition of the content and organization of agricultural information systems but also discusses related problems. The planners, scholars and students will find the book valuable.

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The Systems of Landholdings in Haryana: A Cost-Output Analysis, Ram Chander, Kurukshetra University, Kurukshetra (Haryana), 1977. Pp. v + 115. Rs. 21.00.

This book is a slightly amended version of what was originally a thesis for the degree of Doctor of Philosophy approved by the Kurukshetra University in 1972. The author starts with the basic hypothesis that the institutional arrangements under which farms operate, reflecting the farmer's relations with the land he cultivates and the labour working on his farm, have a bearing on the cost and output relativity. While some attention has been paid to the relation of the farmer with the land he cultivates, the author feels that little work seems to have been done on the relation of the farmer with the labour working on his farm together with the land he cultivates. The present study, confined to the State of Haryana, is an attempt in this direction. The main objective of the study is to ascertain if and how far the cost-output or farm efficiency differential among farms can be explained in terms of system differentials based on the farmer's relationship with the land and the labour that is employed in farming. Land is assumed to be homogeneous and cost and output of actual cultivation being the focus, operational rather than ownership holding has been taken as the unit of analysis.

Four systems of land holdings denoting the farmer's relationship with land and labour have been taken into account. These are: I. Farmers with own land and own(family) labour; II. Farmers with partly hired (crop shared) land and own labour; III. Farmers with hired land and own labour; and IV. Farmers with own land and hired labour.

These are referred to as Systems I, II, III and IV respectively. Those who are familiar with Continuous Village Surveys (CVS) can at once see that the first three categories correspond to the CVS categories of cultivating owners, cultivating owners and tenants and cultivating tenants. The author has added the fourth category to underline the differential on account of using hired labour instead of own labour. The selected sample of farms was divided into six categories based on farm sizes, *viz.*, 0-5, 5-10, 10-15, 15-20, 20-30 and 30 and above. While the sample of 164 farms is spread over seven districts of Haryana State, the author has also selected for study five modern farms including a Co-operative Farming Society, taken at random from among the modern farms in Thaneswar tehsil of district Karnal. The size of these farms was 17 acres, 30 acres, 50 acres, 100 acres and 425 acres respectively.

The study is divided into eight chapters. Chapter I outlines the scheme of the study, and Chapter II gives the survey design and explains the concepts and methods of evaluation. Chapter III contains a brief description of the characteristics of the four systems and also of the five modern farms. Chapter IV is devoted to analysis of systemwise cost and output in terms of per acre values, the only chapter which includes an analysis of the modern farms as well as of the four systems specified above. Chapter V elaborates this analysis according to the size-group of holdings. With four systems of farms and six size-groups, the analysis and interpretation becomes rather unwieldy and sometimes the

readers may find it difficult to keep track of it. Chapter VI examines the systemwise elasticity of output and cost in relation to land. Chapter VII brings out the systemwise differentials in resource use efficiency according to the marginal value approach of the more important items of input. Chapter VIII summarises the findings of the study.

The author has confirmed what theory would indicate, *viz.*, that the institutional arrangements under which the farms operate indeed determine their respective cost and output relativity. It is by conditioning the relative resourcefulness of farms that the difference in the ownership of land or/and labour characterizing the institutional arrangements determines the cost and output relativity.

The study of the behaviour of per acre gross output, per acre cost, per acre net output and input productivity has brought out that farmers in systems I and IV where the farmers own the entire land, form a category distinct from the one represented by systems II and III where the land is partly or wholly leased in. The chief merit of the study lies in bringing out sharply the impact of ownership of land and labour on farm efficiency. The findings of the study perhaps reiterate the need for effecting changes in farm organizations with a view to bringing about greater efficiency in farming.

There are a few points on which the readers perhaps could have sought more enlightenment. Thus while the inclusion of five modern farms in a compact area is quite welcome, it is not clear as to why the entire selected sample of farms should be treated as traditional. In terms of categorisations some of the borderline farms may not be different from the borderline cases in other categories. It is quite futile to treat a farm which owns the bulk of the land and the one where the bulk of the land is leased in one single category as in system II devised by the author. The analysis in Chapter VII where the author estimates regression equations for each of the four systems and makes an intersystem comparison suffers from the same bias. It would have been worthwhile to make tenancy and hiring of labour one of the variables either directly or through the use of dummy variables techniques.

The author relies heavily on statistical averages and tabular presentation. However, the author has nowhere made any attempt to test the statistical significance of the difference between some of the parameters.

The presentation in the book also needs tightening up at a few places. For instance, in Chapter V (p. 61) the author refers to relative efficiency of the quantum of bullock labour as applied in the four systems. He states "...in system III the farmers are financially too weak to afford a better quality. In system IV they cannot afford it for want of their own family labour to take care of their bullocks and if they keep hired labour for this purpose it will not be economically viable." Such statements and observations go unsupported by evidence. The author ought to bring forth some convincing evidence about economic viability rather than mere surmises. In Chapter VII the author states that the estimated parameters of the equation:

$$\text{Log } Y = \text{Log } a + b_1 \log L + b_2 \log HL + b_3 \log T + b_4 \log W + b_5 \log MF + b_6 \log K$$

are shown in Table 13. But

Table 13 gives nothing more than correlation coefficients between selected variables. The author also states: "the value of R^2 indicates that between 92 to 96 per cent of the variation in all the four systems of land holdings has been explained by the independent variables" (p. 82). These values are apparently taken from Table 13 which gives the values of R and not R^2. Despite these weaknesses this study has enough evidence which analysts interested in institutional aspects of Indian agriculture will find quite useful for more rigorous analysis and inferences to be drawn therefrom.

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Migration from Rural Areas: The Evidence from Village Studies, John Connell, Biplab Dasgupta, Roy Laishley and Michael Lipton, Oxford University Press, Delhi, 1976. Pp. vii+228. Rs. 40.00.

Rural migration is a relatively unexplored subject in the social sciences literature. It is also a difficult subject to study. In rural surveys, the migrant, by definition, is absent from the village; in urban studies the migrating individual is far removed from the circumstances and environment from which he has migrated. Questions like: who migrates and why he migrates are not easy to answer. A two-ended study would have to be undertaken but such a study is difficult for obvious physical and cost constraints. The volume under review makes this point explicitly at more than one place. However, the point which is brought out very clearly, though implicity, is that migration as a process can be studied fruitfully only in a multi-disciplinary framework. Unfortunately the economic studies focus mainly on the characteristics of the migrants without going into the processes through which the association between a particular characteristic and migration is brought about. Thus, for example, the man-land ratio and the number of migrants from a village are found to be correlated. The correlation is positive in some cases and negative in others. This could be due to geographical diversity but equally likely is the possibility that migration over a period of time itself alters (lowers) the man-land ratio yielding a result which is contrary to what one might have expected *a priori*. On the other hand, the sociological studies provide a great deal of insight into the processes but do not enable one to arrive at meaningful generalisations. This is inherent in the differences in methods and approach of individual social sciences, but one can always hope that the type of review of studies on migration that has been attempted in the present volume would be of immense help for future multi-disciplinary work in the area. In fact, the most significant contribution is the methodological and substantive questions it raises for further research.

The study is part of the village studies programme of the Institute of Development Studies (IDS), University of Sussex. More than 2,000 village

studies from different parts of the world done by researchers from different disciplines (economics, sociology, social anthropology, geography, etc.) have been included in this programme with the objective of providing information contained in them in a form which can be more meaningful for policy making and for further research and study. The results on migration have been published in the volume under review. It consists of nine chapters, which, as suggested by the authors in the Introduction, may be grouped into three parts. The first part (Chapters 1 to 4) is concerned with the economic, social and demographic characteristics associated with migration. The second part (Chapters 5, 6 and 7) deals with the impact of migration through remittances, through the readjustments made necessary due to absence and through changes in behaviour and perceptions of the migrants on their return to the village. The third part (Chapter 8) is a quantitative analysis of 40 village surveys of the Agro-Economic Research Centres (AERCs) in Delhi, Gujarat (Vallabh Vidyanagar) and Madras.

Migration studies have, in general, attempted to identify the characteristics of the individual migrant or of the household to which he belongs. The IDS study adds another dimension, *viz.*, it seeks to identify the characteristics of the villages that send out migrants. In general, the study finds much more explanatory power in the village level variables rather than in the villager or the household level variables. Among the village level variables, rural inequality and social structure variables such as distribution of operated holdings and the proportion of labourers to cultivators among the working population are strongly related to migration rates. However, it is not the poorest households or the most disadvantaged individuals within the village who migrate. The poorer households have high migration rates but a large part of this is rural-rural migration yielding poor returns. As a result, migration may accentuate rural inequality rather than mitigate it. The link between education and migration is another factor that reinforces inequalities in resource distribution within the village in so far as education and high return migration benefit the already better off sections of rural society. The Todaro hypothesis which emphasizes the rural-urban income differential is inadequately supported by empirical results partly because it is too simplistic in that it excludes all non-economic factors and partly because of mis-specification of variables. The push-pull dichotomy in migration studies is also too simplistic in that it ignores the study of migration as a process. The 'citylights' argument is not fully supported because the villagers' perceptions and needs are far more complex than is implied in the 'bright lights' hypothesis. The villager migrates not necessarily because of city attractions but for certain forms of social consumption (health, education) available only in the urban areas.

Chapters 5, 6 and 7 deal with the impact of migration on the village of origin. In general, the results show a preponderance of negative effects. The proportion of migrants remitting income as well as the number of households receiving remittances varies a great deal but in general the remittances are small in relation to the income of the recipients. They have hardly any impact on intra-village inequality and are often negatived by out-remittances. These conclusions are supported by data from the studies. The conclusions about the impact on demo-

graphic and social variables (*e.g.*, impact of absence of young males on the age-specific sex-ratio and the natural rate of increase of population or the impact on the role and status of women or on the authority structure within the village) are interesting but largely speculative in nature. The fact is that village studies in general have not gone into these aspects in any depth or detail.

Chapter 8 presents a quantitative analysis of migration data from 40 villages out of the 77 villages surveyed by the AERCs of Delhi, Gujarat and Madras. This analysis consists of a discriminant analysis of 40 villages, 26 featuring low migration and 14 high migration; a correlation and multiple regression analysis of 29 villages; and a detailed analysis of migrant characteristics from 16 villages. With all this sophistication in method and analysis, the data do not seem to give conclusions that may be of help for policy making for they are too tentative and the data base inadequate. The authors recognize this. Yet the policy conclusions are important and need to be emphasized.

The authors distinguish between successful and unsuccessful migration. The former leads to transfer of labour from low productivity to higher productivity activities and needs to be encouraged while the latter leading to an accentuation of those very factors that caused it needs to be discouraged. Increasing urban opportunities is important but not enough, not only because of the Todaro result but also because of high costs of urbanisation and the fact that the new urban facilities cannot be confined to the new migrants alone. Rural development in the widest possible sense would help but only if it is geared to the needs of the poorest villages and the poorest villagers. Reduction in intra-rural inequality both in terms of resource availability and in terms of job opportunities would be the most desirable form of policy intervention. Such a policy is no doubt emphasized but seldom in the context of migration. Yet another dimension is the need to facilitate mobility within the rural areas or what is termed as rural-rural migration. The authors derive this conclusion but the emphasis is inadequate. In fact, it would be better if the discussion clearly focuses on mobility of labour rather than on migration. Migration or a spatial change in residence or work place which may not always be accompanied by occupational mobility becomes more and more necessary in the development process. The settlement patterns in the rural areas have been determined historically by technological and economic factors that must change with development. In such a situation, it is not always possible to take jobs to the village. The villager must move to the job. Inability or unwillingness to do so on the part of the villagers leads to a situation where large scale under-employment coexists with labour shortages on work sites or in agriculturally developed areas. Removal of obstacles to mobility in the form of cheap transport, provision of shelter and public facilities, organized information flows would result in more mobility and less painful migration which might ultimately result in a settlement pattern which is more in line with the present day techno-economic environment. Another dimension seldom considered in migration studies is that urbanisation means not merely the development of large industrial towns and metropolitan areas, but it also consists of development of the smaller

more spatially distributed towns. Development strategy for rural areas has to give more importance to this category. Research on and analysis of migration flows also needs to consider them more appropriately as a distinct category.

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Systems Simulation in Agriculture, J. B. Dent and M. J. Blackie with assistance from S. R. Harrison, Applied Science Publishers Ltd., London, 1979. Pp. x + 180. $ 23.00.

Agriculture is practised in the form of production systems, enterprise or farming systems, and purposes of agricultural practice generally involve economic consideration. The economics of such systems is very complex because of the underlying biological and physiological processes. The successful manipulation of such systems requires understanding of the complex interactions of various academic disciplines, *viz.*, sociology, economics, biology, physiology, etc. Too often in academic life the pendulum is located at the extremes and that is why one finds that the research carried out in the laboratory has often been irrelevant and meaningless when put into practice. Of late, the inadequacy of the laboratory research of isolated parts of agricultural systems has been recognized and it is this recognition that led the practitioners to analyse the implications of research findings with reference to the whole system through inter-disciplinary approaches. However, this simple, naive concept of needing to look at the whole system has been developed by theoreticians far beyond the level at which the approach can still be of any practical relevance. At this juncture a book that teaches how practically useful systems simulation models can be built is welcome.

The book under review is said to have been designed as an introductory text for the researchers and extension workers in agriculture who had little opportunity to become familiar with systems analysis. However, the authors expect that the readers will have a basic grounding in statistical methods, some knowledge of computer programming and general appreciation of agriculture, apart from a firm understanding of their own speciality. The authors also hope that even the experienced systems modeller will find something of value, perhaps in terms of refreshment of ideas, inspiration to correct entrenched faults and the like. The book is not concerned with the systems theory/analysis in general, rather the authors have endeavoured to expose the readers to only one type of system analysis, *viz.*, computer based systems simulation.

The book has seven chapters and the text runs into 173 pages (including bibliography.) The first chapter on 'Principles of Model Building' serves as a good introduction to the subject. Chapters 2, 3 and 5 contain stages of systems simulation exercises in sequence, *viz.*, Model Construction (Chapter 2), Computer Consideration (Chapter 3) and Model Evaluation (Chapter 5). In Chapter 4 the need for stochastic specifications in systems simulation and their merits and

demerits in the practical context are discussed. Chapter 6 is concerned with the statistical (experimental) and mathematical (optimizing) techniques of computer simulation design, and their usefulness to the modeller particularly for optimal management policies is discussed. The last chapter examines the areas of impact of systems concepts in agriculture and the use of modelling within these areas; attention has been focused on the direction of research, the potential for effective deployment of research resources and on the use of information system to assist management at farm level, the extension services and policy makers.

In the Preface the authors have indicated that the book is designed for the beginners. However, this reviewer finds that except for the first and the sixth chapter, the book is not an easy reading for the beginners for the following reasons. Firstly, in many cases the definitions and concepts are inadequately expressed and the reader has to refer to other books for a clear understanding. For example, the notations of Industrial Dynamics* are introduced in Chapter 2 without adequate explanation and subsequently these are used for sketching complicated models in a way as if the readers were conversant with them. Secondly, early introduction of computer consideration (Chapter 3) and the frequent use of computer language disrupt smooth reading. True, in computer based simulation exercises computer consideration arises right at the model construction stage. But, to a beginner what is more important is to first understand how with reference to specific objectives systems modelling is done, what are the different stages to be gone through before getting the model outputs and in what way these outputs meet the stated objectives. In the reviewer's opinion this purpose could have been better served by first resorting to other available symbolic representations of systems modelling and the chapter on computer consideration could have been presented later. After all, computer is not essential for simulation modelling. The emphasis on computer consideration right from the beginning has led the authors to focus more on judgment, flexibility and practicability of systems simulation before making the beginners a systems model builder.

Thirdly, in the Preface it is indicated that the examples on the Barley-Leaf-Rust Model and the Pig-Herd Model would be described and defined in the appendices to early chapters and gradually woven into the text to assist explanation of various procedures. Here again, as the two models have only been described and not given any symbolic representations the inclusion of the models in the text of Chapter 5 (Model Evaluation) looks like a discrete jump rather than a continuous process as envisaged in the Preface. Finally, even though in Chapter 4 and elsewhere the need for stochastic specification has been emphasized, the model builder is discouraged to use them in practice without giving any convincing argument. Since the authors expected the reader to have good knowledge in statistics, in the reviewer's view a fuller exposition on the subject should have been given and convincing arguments could have been put forward

* J. W. Forrester: Industrial Economics, MIT Press, Cambridge, Massachusetts, U.S.A., 1968.

by comparing the outputs of a deterministic model with those of its stochastic counterparts (with valid as well as superficial stochasticity). This could have warned the reader against superficial treatment of stochasticity in simulation modelling.

However, the above comments do not undermine the usefulness of the book. The book is of immense value to the agricultural researchers, managers and extension workers provided they already have a basic grounding in systems analysis.

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Some Problems of Co-operative Farming, S. H. Deshpande, Himalaya Publishing House, Bombay-54, 1977. Pp. vii + 196. Rs. 26.00.

Co-operative farming has been considered as an obvious and logical solution to the basic problems of agriculture in India, since the Congress Agrarian Reforms Committee published its report in 1946. With the adoption of the programme for the setting up of pilot projects in pursuance of the recommendations of the Working Group on Co-operative Farming, both the theoretical and practical aspects of co-operative farming were widely discussed. However, Deshpande felt that the subject still affords some room for analytical inquiry and thus has attempted to explore some aspects which have either not been perceived at all or have received inadequate attention. He has focused his attention on the central problem of 'Incentives', the lack or weakness of which, according to him, largely explains the poor performance of co-operative farming in India.

In India the Co-operative Farming Societies have been classified into four types. Deshpande has devoted his book to an exposition of the problems of a Worker-Producers Co-operative Joint Farming Society, in which the members pool together not only their land and capital resources but also their labour. In practice, the pooling of labour means that the members claim a right to employment on the farm. Thus the obligation to offer employment to its members becomes a special structural feature of this type of society. According to the author, this feature becomes a hurdle to the growth of such co-operatives as it leads to "the rigidity in the downward adjustment in the supply of labour" (which tantamounts to a partial restriction on labour market) unlike on the capitalistic farms. If all members exercise their right, it is argued, the *available* work on the farm will have to be shared by all members *equally*. As a result, the larger holders among the prospective members who had more work prior to co-operativization stand to lose a part of their employment (and income from it) to those who had smaller land holdings. This explains the weak response from medium and large holders to this programme. Another negative incentive in organizing a co-operative farm arises because every member has a right to withdraw at his discretion or a member can be expelled by the management. This may be accompanied by withdrawal of his pooled assets, which may result in the farm suffering not only economically but physically.

Assuming that after overcoming the above types of initial difficulties with mutual understanding, Deshpande has drawn attention to the problems of relative valuation of different kinds of jobs on the farm which may bring in dissatisfaction and sloth amongst members resulting in low production and productivity. In the initial stages, it is presumed that because of the subsistence nature of farming practised by most of the farmers, the wages will be at levels lower than the prevalent market rates and the distribution of the total income on the farm will have to be so done that each member will get a (fluctuating) share in the total income at the end of the year depending on what the farm has produced. In this situation the wage differentials in remuneration cease to have any connection with the labour market and become a matter to be consciously decided by the co-operative farming society. This presents a new kind of problem because of the conflicting pulls in the opposite direction of efficiency and distributive justice. Because of the skilled workers being in a minority, it is feared, efficiency is likely to receive less weightage.

Another difficulty pointed out by Deshpande will be the temptation to seek employment outside the farm on those days when the wages outside the co-operative farm are higher than the average daily earnings on it. This may seriously disorganize the work on the farm, unless minimum number of work days per member is prescribed and enforced.

Citing illustrations from the U.S.S.R. and China, Deshpande has pointed out the difficulties which arise in the payment of piece rates rather than time rates in order to get over the tendency towards 'sloth' and encourage high work output. If the farms are large and the number of crops cultivated and enterprises undertaken on the farm are many, the types of work/skills required will be large in number. To make such a system work hundreds of norms will have to be worked out theoretically and to check, supervise and account over the work performance will require a large administrative machinery which will eat into the profits of the society.

The assignment of work and the remuneration to the member workers is another aspect analysed by the author. There are two ways in which workers can be paid: (1) according to their specialisation and (2) according to the work they actually do whatever be their specialisation. In the former system the worker will be graded, whereas in the latter the work will be graded, creating an artificial dichotomy between the worker and the work. The problem arises because there may not be enough work of specialisation to provide for all such specialised workers for equal number of days as non-specialised workers. They may thus be forced to work in non-specialised grades on other days. To maintain a correspondence between the specialisation of the worker and the work of his specialisation will be a difficult task, resulting in some workers remaining dissatisfied or in the tendency to 'padding and favouritism', as in Soviet Kolkhozes. The essence of the incentive problem of co-operative farming will thus be seen to lie in the fact that organizationally it partakes the structural features of the family in the downward rigidity of the supply of labour without compensating family ethic which dissolves the work assignment and incentive problems.

Attention has also been drawn to the problems arising in the allocation of the work and its supervision by the manager who is either a paid employee or a member elected. In the former case, he being an employee and a boss simultaneously, "a certain uneasy equilibrium might develop in relationship between the manager and the members. In the latter case, the relationship between the members *inter se* may not be without friction. Both of these situations will have adverse effects on discipline and work efficiency." Following the same analytical method, he concludes that such experiments may not succeed even in respect of worker-producers co-operative farming societies of small Indian farmers.

Deshpande's analysis in Chapter 2 assumes that the available work will be shared among the members. But the question arises, in such a situation, why the land holders should proceed ahead with the proposal to have a co-operative joint farm when no benefits are visualised? But in Chapter 6 the author had stated that "Another source of diversification of jobs arises in the shape of diversification of crop enterprises and this is a distinct possibility *after* co-operativization even if the members practised mono-culture before it. Non-farm subsidiary enterprises, if added to the farm's repertoire, will contribute their own quota to the existing variety of skills" (p. 76). If these prospects are assumed for analysis of problems relating to work assignment and income distribution, how can there be no increase in employment on the farm be assumed in Chapter 2? In developing his argument he has drawn on the experience in the U.S.S.R. and China. But considering the manner in which these farms were set up, the political system under which they have been working and the real centres of decision-making being located outside the farm, can these be theoretically comparable with voluntarily established worker-producers co-operative farms in Indian villages?

The main conclusion of this book is that the organizational structure of the worker-producers co-operative farming societies is not of a kind that satisfies the test of efficiency. In the first place there are certain positive disincentives in the initial effects of co-operativization. If they come into existence they are likely to be ridden with dissatisfaction, discord and indiscipline. Thus such farms wherever they exist will tend to disintegrate leading to division of land on a family basis. Thus this approach cannot provide a solution to the general agrarian problem.

The author has devoted a chapter to a critical examination of 'individual farming on co-operative lines' advocated by Otto M. Schiller as an alternative to co-operative farming. In his scheme there is no pooling of land or no joint cultivation. Many activities relating to production may be secured co-operatively. After discussing the problems which may arise in the implementation of 'common cropping scheme' and the adoption of 'vertical and horizontal crop rotations' and 'rational layout of farms', Deshpande concludes that though it is an attractive idea, it is not easy of adoption in general but some of its features can be accommodated in the new settlements.

This book is a good research contribution to the discussion on co-operative farming, particularly when a rigorous group farming theory or a coherent

analytical framework for the subject is lacking. It takes the analysis further from the point where earlier discussions stopped because intricacies started cropping up. But the reader finishes reading of the book in a mood of despondency because after an incisive analysis, no constructive alternative solution to the most pressing problem has been proposed.

V. M. Jakhade

Economic Consequences of the New Rice Technology, International Rice Research Institute, Los Banos, Philippines, 1978. Pp. ix + 402.

The International Rice Research Institute (IRRI) is well-known as the pioneer in biological research related to the development of new rice technology. What is less well-known is that IRRI has a small but devoted group of economists who are not content in merely 'maximizing interactions with their colleagues in biological sciences and engineering' but have the necessary expertise and dynamism to play their role as assessors of the socio-economic consequences of the new rice technology. The volume under review is a document of how they have performed in this respect.

The volume contains 14 resource papers that were presented in the conference on "Economic Consequences of the New Rice Technology" held at IRRI between December 13-16, 1976. The materials have been arranged under six subject areas, namely, 'Output and Supply', 'Farm Income Structure', 'Labour and Mechanization', 'Fertilizer and Water', 'Social Benefits' and 'Policy'. Each paper is immediately followed by a critical comment.

One of the major concerns for many is that despite isolated cases of high yields from the modern varieties the national average yields of rice in many Asian countries have continued to remain low. The Herdt-Wickham paper for the first time attempted to explain the gap between potential and actual rice yields in the Philippines. How far they are justified in not treating dry and wet seasons separately in their analysis will be debated by economists who have interest and knowledge about rice production and the new rice technology. In this reviewer's opinion, the suggestion of Ahsan that the level of potential yield and the yield gap be situation specific in terms of seasonal variation, soil variability and water regimes is worth consideration.

The Ranade-Herdt paper will be of special interest to those who are interested in changes in income distribution as a result of technological change. Their conclusion that there are no radical changes in the share of earnings of various groups as a consequence of technological change may be valid for the Philippine situation but is unlikely to be supported by evidences in other countries. The Ranade-Herdt paper and the paper by Barker and Cordova contend that labour utilization in rice farming in the Philippines has not decreased following wide adoption of the modern varieties. It is possible that the adoption of modern rice varieties may actually lead to an increase in labour use per hectare despite some

degree of mechanization, specially for land preparation, which is more a historical process than an effect of adoption of modern varieties. Yet, as Griffin remarked in his comments on the Barker-Cordova paper, in most Asian countries there has been a deterioration in the real earnings of agricultural labour class during the same period.

The most interesting reading in the 'Fertilizer and Water' section comes not from the two resource papers but from Small's comments on the Wickham-Barker-Rosegrant paper. This is not to imply that the two papers and Desai's comment on the other paper do not make stimulating reading. But to this reviewer Small's treatment of the subject held out greater appeal.

Discussion on returns to research has assumed great importance in recent times. This is because Governments and foundations want to be assured that funds received from them are not wastefully expended. The materials contained in the section on 'Social Benefits' will therefore be of considerable importance to those who wish to involve themselves with such calculations. This reviewer has no such ambition and, also, has no hesitation in making frank admission of his incompetence in the subject. However, he would like to ask whether those who engage in such exercises are making conscious efforts to separate out the effect of developmental expenditure as distinct from research (and extension) expenditure on the shifts in supply especially where large developmental investments have been made independently and much ahead of the research investments. That supply shifts cannot be solely attributed to changes in technology has been pointed out by Pinstrup-Andersen in his comments on the Hayami-Herdt paper.

The section on 'Policy' has three papers. The Kikuchi-Hayami paper has the basic aim to prove that the Philippine Government's decision to develop irrigation in view of increases in the rate of return to investment in irrigation systems reflects that policy decisions are made on a rational basis. This view has invited a strong rebuttal from Siamwalla in his comments on the paper where he has pointed out that in the Philippines the decisions on irrigation constructions, an essentially long-term policy decision, were taken at times of high rice prices which are short-term phenomena. The wisdom of describing long-term policy measure which aims at meeting short-term exigencies is therefore rightly questioned. Barker, Bennagen and Hayami have examined alternative policies for achieving self-sufficiency in rice in the Philippines through a number of policy alternatives such as rice support price for producers, fertilizer price subsidy and investment in irrigation systems. These alternative policies were compared by estimating their effect on producers' income, changes in rice import cost and foreign exchange saving. Even though India is no longer as hard pressed for food as she was a few years ago, the attainment of self-sufficiency has still remained a national objective. The analytical procedures followed in this paper may help in a better understanding of the relative benefits of alternative policies. In the last paper in this section, Ruttan examines the agricultural development process in terms of interaction between technical and institutional change. Valdes's comment on this provides another perspective to the issue.

The volume concludes with two general comments from Hanumantha Rao and Ranis in that order.

As one goes through the pages of the book one is struck by the comprehensiveness with which various aspects of the new rice technology as related to the economic consequences have been dealt. In general these have been examined by analysing data from the Philippines. The analytical procedures can, however, be utilized for any other country with suitable modifications. The usefulness of this volume to professional economists has been greatly enhanced by the comments which have followed each paper.

Central Rice Research Institute, T. K. Pal
Cuttack (Orissa)

Farm-Level Constraints to High Rice Yields in Asia: 1974-77, International Rice Research Institute, Los Banos, Philippines, 1979. Pp. x + 411.

Even in areas where modern varieties are used, farmers' yields are frequently lower than they could be. The constraints studies reported in this volume have attempted to determine why rice farmers are continuing to produce less than the known potential. A network of co-operating researchers from Thailand, Indonesia, Sri Lanka, Bangladesh, Taiwan and IRRI was organized to jointly plan and conduct co-ordinated studies of constraints that keep rice yields on farmers' fields low. The volume under review reports the results of individual studies with a lead paper by Randolph Barker explaining the concepts and the methodology adopted in the co-ordinated studies.

This review is confined to the 'Overview' of the constraints as reported by R. W. Herdt, and as such does not reflect the richness and diversity of research material contained in country studies. Likewise it misses the cogent discussion of concepts and methodology in Barker's lead paper, which incidentally also reviews the changes taking place in the adoption of new rice technology, production, and yield. Serious students of the subject would be well advised not to skip likewise.

Herdt begins by clarifying that the project did not attempt to explain or identify the constraints to rice production imposed by circumstances beyond the control of farmers—the policies of Government, weather, soil conditions, irrigation facilities, etc. The 'narrow focus', in fact, heightens the significance of the research findings inasmuch as it reveals the gap between the potential and the actual which the farmers can conceivably close on their own. If they are not attempting to do so, what are the constraints?

Four hundred ten trials conducted (1975-1977) in ten locations under wet season conditions showed an average yield of 3.6 tonnes per hectare (t/ha.) using farmers' inputs and 4.5 t/ha. using high inputs, thereby demonstrating an average yield gap of 0.9 t/ha. There was, however, considerable variation in the yield gap between locations, ranging from 0.4 to 1.8 t/ha. There were similar locational variations between farmers' yields as well as between the potentials. The point to

note is: "the correlation between the level of the farmers' yield and the yield gap was zero." The dry season trials revealed a higher average yield gap of 1.3 t/ha., with corresponding higher farmers' yields and potential compared to the wet season.

Analysis of constraints is divided into two components: (*a*) biophysical and (*b*) socioeconomic. In the study of biophysical constraints, a limited number (2 to 4) of test factors were chosen to determine the component of the gap which could be separately attributed to them. For the wet season, a higher dose of fertilizer, higher insect control and high weed control could have bridged the gap on an average by 0.4, 0.4 and 0.1 t/ha. respectively. In the dry season, the respective contribution of the three variable test factors would have been 0.9, 0.6 and 0.2 t/ha.

The study of socioeconomic constraints attempts to explain why the farmers are not taking advantage of the biophysical potential increase in yield. Where additions to output are small—as in the case of weed control—farmers would very likely forgo the option, even without considering the relative cost and benefit. All the same, the data from a subset of 239 wet season and 205 dry season trials were analysed by budgeting method to determine how economically attractive the high input levels were. The analysis showed that in four locations, the use of high inputs in the wet season, on the average, resulted in a *reduction* of net benefits to farmers. In the remaining six locations high inputs increased the profits, resulting in a net benefit of $ 0.50 for each extra dollar invested. In the dry season, in nine out of ten locations returns from high inputs were positive, the average net benefit was $ 0.80 for each extra dollar invested. Where the data permitted, costs and benefits of each of the separate inputs were evaluated. The exercise showed that for the wet season the high level of insect control added more to costs than it did to returns in six out of ten locations. The high level of fertilizers decreased net returns in three out of ten locations, but gave an average benefit-cost ratio of 1.7:1. In the dry season, the returns were more favourable. The net return for insect control was negative in six out of ten locations, but the benefit-cost ratio was 1.2:1. For fertilizers the net return was negative only in one location and the benefit-cost ratio was 2.6:1.

While the importance of institutional factors such as tenure, credit institutions (cost of credit) in the decision-making of farmers is recognized, in the economic analysis reported above their impact was not considered. The study however examines the effect of the ratio of price of rice and price of fertilizers (*i.e.*, price of fertilizers in real terms) on the yield gap attributable to fertilizers. The correlation is low ($r = .04$) for the wet season but fairly high ($r = .65$) for the dry season. Finally, the study draws attention to the disincentive effect of high cost of private credit and inferior tenure status on the higher use of modern inputs.

At the cost of repetition, it may be worthwhile to quote the concluding observation in Herdt's paper: "The overall weight of the evidence examined suggests that it is relatively easy to account for the dramatic gap between what is technically possible and what has been achieved: what is technically possible is

more modest than most observers admit; the economics of substantially higher yields is not attractive; the costs associated with the credit and tenure arrangements that often prevail in developing countries make high input use totally unattractive for some farmers. Thus, the available technology is being used to its potential. If further growth is to be realised, continued development of technology must be combined with institutional reforms that make current technology more attractive to users."

M. L. Dantwala

Poverty, Planning and Social Transformation, Alternatives in Development: Planning, C. T. Kurien, Indian Council of Social Science Research; Allied Publishers Pvt. Ltd., New Delhi-2, 1978. Pp. ix + 174. Rs. 30.00.

This is both an important and a difficult book to review—important because of its subject and the challenge offered to familiar thinking, difficult because of the analytical frame through which well accepted propositions are sought to be expressed. On a theme so pervasive as the relationship between poverty, planning and social transformation, knowing our failures in the past, one looks eagerly for new insights and approaches. Kurien has done well to point to the limitations of the implicit assumptions of courses of policy advocated during the seventies. Describing poverty as the socio-economic phenomenon whereby resources available to a society are used to satisfy the wants of the few while the many do not have even their basic needs met, Kurien makes short work of the growth and 'growth plus' strategies and of the best known political slogan behind eradication of poverty. Therefore, he insists that poverty should be seen, not merely as a state of affairs, but as a process, as a result of the interaction between the 'structure' of the economy, that is, the manner in which resources, specially non-human resources or property, are owned and controlled, and the 'working' of the economy, or the organization of economic activity and the use of resources within the structure.

The substance of several of the principal conclusions reached by Kurien will command wide acceptance. Thus, the existing economic system produces both 'poverty' and 'growth', pushing some towards and below the poverty line, pulling others into prosperity and influence. There was considerable inequality within the technologically stagnant traditional economy which is yet different from that observed under conditions of change and growth and steady widening of the market economy and the use of money. The economic transition of the nineteenth and the early twentieth centuries deepened the poverty of large numbers of people so that, even in the past, poverty was closely linked to a certain development process. Landlessness was and is the essence of rural poverty, and much of the so-called unorganized sector constitutes the poverty belt of the economy. The problem of poverty demands a societal and systematic approach. Mass poverty in India cannot be resolved without a radical restructuring of the economic system. The first charge on society's resources must be to meet the basic needs of

the entire population. This cannot be through a system based on private capitalist accumulation. The basic economic strategy must be to activate the human potential of the economy through the participation of all persons in the economic process and production to meet common minimum needs, to reconstruct existing economic institutions, and to accelerate the processes of social transformation by arousing consciousness among the have-nots and putting power into the hands of the people.

These and like propositions stand on their own merit and can be derived directly from all that we know and have learnt through study and observation about the socio-economic and political realities of India, especially of rural India. The analysis and the solutions proposed go together. The central difficulty of Kurien's book is that he relates his factual and policy conclusions to what is presented as a new 'frame of analysis'. Fundamentally, this is based on a distinction between 'needs' and 'wants', between 'need-based' and 'want-based' economic activity. In summarising in a few words an elaborate argument that has been presented with much skill and learning, there is an obvious risk of doing injustice. All the more so when, having pondered over the thesis, one finds it hard to go along with it.

The 'want-based economy' of Kurien's conception appears to correspond to the typical competitive economy studied by economists in which scarce resources are sought to be put by all the operational units to the most profitable uses. The urge for maximizing profits becomes the driving force for expanding economic activity. In the 'need-based economy', economic activity is geared to production of commodities or services for use, not for exchange. The want-based economy is dominated by the forces of the market; on the other hand, in the need-based economy, decisions affecting producion, use and distribution are essentially societal decisions, derived perhaps from custom, tradition or deliberate policy, and exogenous to the system. Transfers and activities corresponding to the need-based economy are described as the N-Circuit, those corresponding to the want-based economy as the W-Circuit. The traditional rural economy had within its N-Circuit a lower circuit corresponding to the needs of the mass of the population—N-Circuit (L) —and a higher circuit based on surpluses extracted from the activities of the lower circuit—N-Circuit (H). The two circuits functioned more or less independently. The economic transtions of the nineteenth century disturbed the equilibrium of the traditional system and gradually the N-Circuit (H) became converted into a W-Circuit related to a want-based economic system. As the W-Circuit reached out to the N-Circuit, a cross-circuit between the two—C-Circuit for short—began to develop. These processes proceeded cumulatively, first largely outside agriculture and the rural areas and eventually encompassing them as well and leading to concentration of land in fewer hands and to large scale landlessness. The N-Circuit became fragmented and disintegrated, yet it was not fully incorporated into the W-Circuit. Units which had surpluses could become part of the W-Circuit, but a large part of the household sector was driven into penury and a losing struggle for bare survival. This is at the heart of increased poverty and absence of any kind of balance in the Indian economy as it has been shaped

through the economic plans of the post-Independence period. The plans failed to grasp the basic problem and instead accentuated old contradictions and created new ones.

In seeking an alternative policy frame for tackling the deep-rooted problems of poverty, Kurien therefore seeks to create a modified need-based economy built around the needs of the poor and dispossessed and especially of the weakest units of the household sector. This involves deliberate separation of the N-Circuit and the W-Circuit and cutting off the C-Circuit that links them. Collective farm units, co-operatives and other organizations of the poor, functioning under the special care of the state, then become a new S-Circuit (Social Circuit) which insulates them from the influence of the W-Circuit. Such an approach has to be followed through and adapted to the conditions of each locality and social situation. The argument, in brief, is that the W-Circuit should be contained, a large part of its surpluses transferred to the S-Circuit, and state power should be employed primarily for releasing those organized into the N-Circuit from the 'expansionist domination' of the W-Circuit.

This statement of the argument is perhaps too bare to pass as fair. However, the considerations which come to one's mind in commenting on Kurien's approach are of a broader kind. Certainly, the problem of poverty demands wide-ranging social transformation and deeper and more penetrating planning strategies than those followed in practice since Independence. The economy and society have to be seen as a whole while, at the same time, special organizations of the weaker and the poorer groups and new kinds of primary units based on community use of community resources are created. In place of the present dichotomy between the organized and the unorganized parts of the economy (or need-based and want-based economic activities), a unified, composite economy has to be created at the regional and national levels, bringing together agriculture and industry and large and small units. The problem of poverty has to be approached simultaneously in terms of a series of strategies, including economic, social, organizational, technological, educational and others. The distinction between needs and wants itself seems somewhat simplistic and fragile to serve as the foundation for a whole system of analysis of the economic and social processes which have been under way in the changing, complex national and regional economies of a country such as India. Adam Smith had long ago distinguished *necessaries* from *luxuries*, meaning by the former "commodities which are indispensably necessary for the support of life". In discussing necessaries, comforts and luxuries, Marshall had offered the criterion that the income of any class is below its *necessary* level when any increase in their income would in the course of time produce a more than proportionate increase in their efficiency. He regarded any stinting of necessaries as wasteful.

All of Kurien's substantive propositions can be advanced without recourse to his particular form of analysis of the nature of the economic process as it occurred before and since the beginning of planning. Parts of the economy can be less and less insulated from one another. On the other hand, new and more just linkages have to be created, which take due account of size, resources, tech-

nology, region, and character of different socio-economic groups. There are gradations of needs to be met, some directly through the operation of the principle of effective demand, some through enlargement of purchasing power (as through fuller and more productive employment), some through expansion of social consumption and the responsibility of society as a whole. Whatever the limitations of planning thus far, India has now the means and the capacities to resolve the problems of mass poverty within a measurable period. The social, political and organizational constraints are clear enough and these have to be overcome on their own terms, so that the strategies of institutional and structural change, the massive resource transfers needed, and the basic policies for putting the available human resources to effective use can be brought to coverage on the key problems of change and organization within every region and in relation to each socio-economic group in the country.

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Tarlok Singh

An Introduction to Agricultural Extension, A. T. Mosher, Agricultural Development Council, New York, U.S.A., 1978. Pp. 114.

The book instantly earns a reader. The reviewer fell a victim of this attribute. When it was in queue on my desk for review the extension men visiting the room at once picked up the book, glanced through it and borrowed it. This resulted in my receiving several reminders from the editor.

The book is a collection of lectures delivered as a part of the introductory undergraduate course in agricultural extension at the University of Sri Lanka in 1974 and repeated in 1975.

It is not a 'scissor-paste' type book but an outcome of serious thinking and rich cross-cultural experience spread over decades. Mosher has been associated with Extension since his childhood. Hardly a few in India know that his father was the county agent of first batch. The county agents then, did not drive a cadillac but rode through the unmetalled roads. The first research project in Extension in India was planned and initiated by Mosher. One finds the reflection of all these in the book.

The book starts with an interesting question of an actual life situation and proceeds to answer it analytically. This style has been maintained throughout the book and this is what makes it a book with a difference.

One finds several information in this book not easily found elsewhere. Illustrative to it is the story of Prof. Holden and other elements of the oral history of the Co-operative Extension Service. This also says most interestingly the danger in emulating the U.S. Extension model. The U.S. situation at the birth of Extension was very different from the situation extension encounters on 'its first cry' in the several developing countries of the world. "Extension was introduced in the U.S. into an agriculture that was already modern; largely commercial. Farmers were already using purchased inputs. Credit agencies al-

ready existed. Almost all farmers were within about seven miles of a town where there were hardware and implement dealers, feed stores and grain merchants. Every farm almost without exception touched on a public road." The differential situation makes the need for native thinking all the more important not even to depend on what Mosher says in this book.

The book lists the various roles of Extension and pleads to choose one depending on the needs of time and place. In Chapter 2, the book lists five kinds of understanding needed by extension workers, but surprisingly the "Understanding of the process of planned change" which is a must for any change agent, does not figure here.

The remaining chapters cover extension methods, preliminary principles of effective extension, the adoption and diffusion process, the role of the extension agents, promoting organized group action and supporting activities for extension.

While discussing group action there is a capsule description of the farmers' organizations in Taiwan, Malaysia and Farm Bureau of U.S.A. Towards the end of the chapter are valuable lessons from the farmers' organizations.

Towards the end of the book the author discusses the conflict between extension and research. To this reviewer it seems too dry a subject for an undergraduate to get interested in.

The language is clear and crisp and well within the grasp of undergraduate students in India. Related concepts like 'adoption' and 'diffusion' where most undergraduates often confuse, has been very well clarified in limited words.

The book would be equally useful to the students and teachers of extension, the change agents and administrators. The book should be immediately translated in Hindi for wider reach in India and should be rendered commercially available both in English and Hindi.

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New Delhi

Y. P. Singh

Socialist Agricultural Price Policy: A Case Study of GDR, M. V. Nadkarni, People's Publishing House, New Delhi, 1979. Pp. xvi + 215. Rs. 35.00.

This monograph endeavours to acquaint the students, policy makers and others interested in the principles and problems of price policy in general and agricultural price policy in a socialist setting in particular. It shows how socialist pricing derives its genesis from the Marxian law of value according to which the value of a commodity is determined by labour time socially necessary for its production. It also emphasizes how a system of optimal relative prices emerges where they are proportional to differential or marginal socially necessary costs.

The study has highlighted the achievements of the German Democratic Republic (GDR) with special reference to the transformation of GDR agriculture particularly the trend towards declining rural-urban and inter-personal disparities. It distinguishes between three forms of co-operative property in agriculture, which

differ in the degree of socialisation and hence in the system of wages and incentives. The study also shows how the economic reforms in the sixties replaced the highly centralised, bureaucratic way of decision-making of the fifties by democratic centralism which allowed greater scope for local initiative without diluting the role of central direction of the planned development of the economy.

It notes three stages in the development of the price system of GDR. During the first stage known as 'stop prices' the immediate concern of the authorities after the war was to stop galloping inflation. Due to private trading which was still prevalent during this stage, prices widely varied from place to place and also from time to time. So the fluctuating and uncertain free market prices were replaced during the second stage by a system of 'unitary fixed prices' which were the same for a given product for the country as a whole. During the third stage, an attempt was made to further integrate the price system with economic planning through dynamic prices which took into account the technological changes taking place in the economy. Now, a more flexible price policy has been evolved as a result of which different price forms for various types of commodities have been developed. The first form, fixed prices, holds for mass consumption goods significant from the point of the national economy. To allow for adequate flexibility in the price system, goods which are subject to rapid technological changes are brought under the second price form where only changes below a maximum limit are allowed. Further, the individual enterprises have been playing an increasingly significant role in the price forming process lending greater flexibility and dynamism to the price system. Negotiated prices and prices fixed by enterprises on their own responsibility have now become a prominent feature of the new price system.

But the question arises: What have these reforms achieved? It is argued that "not only in agriculture but also in the whole economy, growth rates had reached their lowest in the early sixties, but from 1965 onwards, economic growth judged in terms of net national production picked up and has been maintained at over 5 per cent per annum particularly in industry. Even in agriculture, growth of NNP and production of important commodities has been accelerated." However, a casual look at Appendix Table II (col. 6) suggests that there is just a marginal and rather fitful increase rather than any acceleration in NNP from agriculture and forestry. Further, as has been pointed out by the author, even retail prices of luxury goods have continued to be fixed by the central authorities rather than being left to be determined by the free forces of demand and supply. There have been no significant changes in retail prices, except for downward revisions in several manufactured articles. Although it appears paradoxical in the presence of unsatisfied demand for several non-basic consumer goods, it is necessary to appreciate that socialist countries have a long history of lower production of and higher priced non-basic goods (owing to greater emphasis on providing basic necessities at a low price or free of charge), compared to capitalist countries. It is further argued that since the average wage levels in the GDR are said to be higher than in other socialist countries, a market determination of prices can also mean a much higher price rise here at least in the short run. So it is admit-

ted that the extension of market mechanism specially for consumer goods is a little slower in GDR in spite of its early start, than in some other socialist countries. This failure of the GDR to formulate an appropriate integrated incomes-wages-price policy also looks like a virtue in the eyes of the author as "the relatively higher prices of non-basic goods have long functioned towards absorbing the excess purchasing power of the people." Further, the author questions the belief that the principle of consumer sovereignty is not respected in socialist countries. Such a view, he argues, is based on self-deception. "If consumer sovereignty means greater priority accorded to the provision of mass consumption goods, we find this in a socialist state rather than in non-socialist states." But any student of economics would know that consumer sovereignty hardly means what the author implies but the freedom of the consumer to guide production according to his effective purchasing power. If the government wishes to fulfil its social welfare function of providing basic consumption goods to the masses, it can use the instruments of taxes, subsidies, etc., to do that but the restriction or lowering of prices of goods having a large pent-up demand is a disregard of the price system which introduces distortions in product mix and results in the sacrifice of consumer sovereignty. That the prices of many manufactured consumer goods are administered by monopolies even in the so-called market economies and are not flexible in the sense that they continuously equalise the free forces of demand and supply, is no justification for the neglect of the market mechanism. Further, because the so-called equilibrium prices do not operate even in the market economies, it does hardly mean that the market system should be thrown overboard. But it does imply that the artificial barriers in the smooth functioning of the system should be removed.

Further, the study reveals that the average proceeds had considerably improved for most of the commodities over the period 1955-66. However, in the period 1966-74, the average proceeds from all agricultural products increased at a slightly lower rate than during 1955-63. The increase in the average proceeds therefore can be said to have tapered off which is interpreted to mean that there has been no tendency for cost of production per unit of output to rise in recent years. Further, the behaviour of the average proceeds in recent years is also construed to suggest that the stage of relying on quantitative increase in production is almost over and that the emphasis now is on increased efficiency reflected in reduced costs. It also attempts to compare the changes in the average proceeds to farms with the changes in other price series like the delivery prices of manufactured goods and retail prices. On the whole, the increase in the average proceeds from agricultural products was found to be much greater than the increase in other price series. The average proceeds have been increasing in face of stable consumer prices. Dandekar in his Foreword to this book has therefore rightly argued that "there is thus an important lesson in the experience of the GDR for all those who believe that, for economic development, a certain amount of inflation is inevitable, if not necessary." Further, it can also be inferred from this that economic development process can be accelerated without artificially distorting the terms of trade against agriculture.

Taxes and support measures are emphasized as a complement of price policy. On the one hand, taxation promotes the desired level of accumulation indirectly controlling consumption and, on the other, it helps absorb the differential rent thus levelling down the inter-farm differences in personal incomes. Support measures are intended to provide inputs and necessary services at reasonable cost. These measures "help farm enterprises to have facilities of a sound infrastructure which is beyond the resources of individual enterprises to build out of their own savings" (p. 155).

Further, it is argued that the provision of basic goods at as low a cost as possible is a fundamental policy of a socialist state, even if it necessitates the use of subsidies. But subsidies cannot be allowed to degenerate into a cover for complacency and have to be minimized. If an economy wants to support the continuously increasing wage levels without creating an inflationary situation, it has to constantly strive for a downward sloping long run supply curve. The cost reductions have to be substantial enough to absorb the current subsidies on food articles and continuous enough to absorb wage increases. But are the costs declining? Again, it is admitted that the evidence is not clear as the cost figures can be misleading when inputs and services to agriculture are subsidised, the extent of subsidy varying from year to year. Besides, in traditionally organized farms, several inputs were raised on the farms themselves whose costs were under-stated or were not properly accounted. But in the industry-type organized farms, many inputs are purchased and all costs are accounted. So it has been rightly argued that costs in terms of scarce resources of land and labour are more meaningful if comparisons over time have to be attempted. In spite of certain limitations, the study has shown that co-operativization of farms has enabled the GDR to achieve reduction in costs, particularly in terms of scarce resources and that steps to organize agriculture on industry-type basis have further accelerated this trend.

On the whole, this book is a welcome addition to the relatively scarce literature on socialist agriculture in the GDR wtih particular focus on the role of price policy. Although, it is mainly a descriptive account of the socialist transformation of the GDR agriculture, yet it does contain sparks of logical reasoning at several places, to establish how price policy and its complements of taxes and subsidies are wielded to promote growth, equity and mass welfare in a socialist setting. However, the author who hails from India and has based his book mainly on the knowledge gained from his visit to the GDR could have done well to present a comparative account of the GDR and Indian agriculture to spell out the policy implications for this country.

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The Impact of Irrigation on Rural Development: A Case Study, M. P. Pandey, Concept Publishing Company, New Delhi-15, 1979. Pp. 191. Rs. 40.00.

Irrigation is the key to increasing agricultural output per hectare and per unit of farm labour in developing nations. The demand for irrigation water generated by modern agricultural techniques is different from those that arise from traditional methods of cultivation. Irrigation systems built for the older technologies of traditional farming are not usually suitable for modern and high-output agriculture. Irrigation as it has developed in India has been found to be suffering because of factors like faulty head-works, the silting up of reservoirs, seepage from canals and water courses, improper and inadequate drainage and field channels, etc. Some of the new projects are suffering from wrong and improper designing of canal alignments, untimely and inadequate supply of water, under-utilization of potentials created, rise in social conflict as a result of political and sociological factors, and adverse effect on income distribution.

Pandey has studied the politico-socio-economic questions that usually arise later when an irrigation scheme is completed. This book presents the data relating to the socio-economic conditions in the Kiul-Badua-Chandan Command Area and to gather such information relating to the same as was important in formulating various schemes of development in the area. The study is based on the data collected from the fields. The book is divided into nine chapters. Chapter 1 of the study describes the features of Kiul-Badua-Chandan project and a brief profile of the command area. Chapter 2 describes the objectives of the study and the sampling design adopted for the survey, while Chapter 3 gives the general description with regard to communication, population, occupation, irrigation conditions and public and financial institutions of six villages which were surveyed. Chapters 4 to 8 present the results of the survey covering a total number of 605 households distributed in six sample villages. These chapters deal with the household and land holding characteristics in addition to cropping patterns and the general conditions prevailing in the villages with regard to irrigation. A chapter further examines the nature and extent of employment obtaining in the households, especially in respect of the agricultural households. Chapter 9 gives the summary and conclusions of the case study. The author has pointed out that the extension of irrigation facilities can never be too much emphasized. The full benefit of land reforms can be enjoyed by the farmers only after water is provided to each plot of land.

The merit of the study lies in obtaining fairly reliable information for a bench-mark survey of the areas which were going to receive irrigation benefits so that through later surveys the benefits flowing from the irrigation systems could be measured. The selection of irrigated and unirrigated villages has not been properly done. As a result of this the data do not reflect the true picture of irrigated or unirrigated villages. Pandey has highlighted the infrastructural weaknesses in the area which retard the development processes in the command area. For want of suitable field channels and distributories the water flowing in the canal does not reach the fields. It has been emphasized how in Halsi, Jogdiha and Belhar farmers are not getting due benefits from the existing canal although it passes very close to the village. Apart from the improvement in the

alignment of field channels and distribution, there is need for their proper upkeep and maintenance. The author's observations have deep significance for Indian planners and for those who are assigned with the responsibilities to guide the implementation of the nation's future agricultural development.

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Economic Efficiency in Indian Agriculture: Theory and Measurement, R. K. Sampath, The Macmillan Company of India Limited, New Delhi-28, 1979. Pp. xi + 191. Rs. 40.00.

The economic rationality of farmers in developing countries has been a matter of debate for quite sometime. Professor Schultz was the first to adopt a most systematic theoretical approach to examine the allocative efficiency of farmers in traditional agriculture* with a view to establishing their economic rationality and drawing conclusions about how best to transform it into a modern agriculture. After the publication of Professor Schultz's book, quite a few studies have appeared for different regions of India, most of which supported the hypothesis of allocative efficiency of the farmer.

The book under review examines the economic efficiency of farmers by splitting it into technical efficiency and allocative efficiency. The linear programming technique has been used for the purpose. The study covers a sample of farmers in Deoria district (eastern Uttar Pradesh) and the data used for it pertain to the year 1967-68. The analysis for the sample as a whole indicates that the extent of economic inefficiency (measured in terms of the difference between perfect economic efficiency optimal output and actual output) is of the order of 36.53 per cent, of which only about one-third is attributed to the allocative inefficiency of farmers, and the rest to the inefficiency in the system (technological inefficiency and lack of immobility of factors of production). Similarly, the analysis for different size-groups of farms also indicates more than 35 per cent economic inefficiency for all the size-groups except the size-group III for which it is about 29 per cent. Except for the first (smallest) size-group, the extent of allocative inefficiency is generally much lower than the technological inefficiency. It needs to be mentioned that the extent of economic inefficiency could have been smaller had the author been able to construct a model which could have taken into account risk and uncertainties arising from market, weather and technology. Further, as the year of study was most possibly the second year of adoption of new technology of rice and wheat, it is quite understandable that the new adoptors could not have been able to exploit the full potential of the new technology and to maximize their profits. In spite of ignoring the effects of these factors on the crop output, the calculated allocative inefficiency of farmers turns out to be fairly small, implying that the farmers have been fairly

* Theodore W. Schultz, *Transforming Traditional Agriculture*, Yale University Press, New Haven, 1964.

rational in the use of their factors of production. The larger extent of inefficiency exists at the system level which is mostly beyond the control of individual farmers, and for which outside agencies will have to play an important role. The policy implication of these results appears to be that in spite of the existence of factors that could have disturbed the established resource allocation equilibrium of traditional agriculture, the prospects of increasing production by improving the allocative efficiency of farmers is not large; it is the improvement in the choice of production function, mobility of factors and development and dissemination of technological knowledge which would play a greater role in increasing the crop output of the region to which the study relates. Thus, logically one hardly finds a major conflict between the above conclusion and that of Professor Schultz. The author has however stated at many places in his book that his conclusion contradicts Schultz's hypothesis of traditional farmers being "poor but efficient". Even if his contention is accepted, the agriculture with which he has dealt does not conform to the type of traditional agriculture with which Schultz was concerned, as more than one-third of the sample farmers had adopted high-yielding varieties of rice and wheat and most of them had been using chemical fertilizers. Instead of defining traditional agriculture anywhere in the book, the author seems to be confusing the words traditional farmer with subsistence and small farmers and had used them interchangeably. Similarly, he has used commercial farmer, capitalist farmer and large farmer as synonymous.

One of the main criticisms of the author about Cobb-Douglas production function approach is that the results obtained by the method relate to average farmer who represents no one. But he himself uses average data of each size-group of farms and makes strong assumption that all the farms within each size-group are identical or at least similar.

For the purpose of his analysis in Chapter 6, he defines a subsistence farmer on the basis of per capita subsistence requirement which works out to Rs. 420 per annum at 1967-68 prices in Deoria. On the basis of this criterion, he says, an average farmer belonging to the size-group 0-1.04 hectare falls far short of meeting his subsistence requirements and hence is a subsistence farmer. While adopting the same criterion, when net income per farm (Table 3.5 and Table 3.15) is divided by the family size per farm (Table 3.1), it is observed that all the first three size-groups having less than 3.08 hectares of land fall short of the per capita income adopted for defining the subsistence farmer. This is also corroborated by the fact (Table 3.32) that more than 59 per cent of the borrowings of these size-groups have been for the purpose of consumption.

The author has not only appended large number of tables to Chapter 3 without caring for their use in his analysis, but has also repeated the same figures in different tables (see data of Table 3.15 and Table 3.17). Similarly, all except two pages of Chapter 2 seem to be completely reproduced from the Farm Management Survey Report of Deoria district. He refers to certain authors, such as Kadekodi (pp. 76 and 105), and Bardhan (p. 15) whose names are nowhere to be found in the list of references. Chapter 4 is generally referred to as Chapter 5 in the text of the latter. In view of all these, one feels that the author has un-

wittingly justified his opening remark in the Preface: "this study was conceived and completed in six months...".

Chapter 4 contains a fairly good review of the theory and measurement of economic efficiency. The approach that the author has adopted for examining economic efficiency of farmers could be fruitfully used by other researchers in the field.

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Price Policy for Wheat in India: An Economic Analysis of Production and Marketing Problems, D. S. Sidhu, S. Chand & Co. Ltd., New Delhi-55, 1979. Pp. xii + 127. Rs. 27.50.

Though enough has been written on the subject of Green Revolution in India, this book by Sidhu provides, however, a refreshing insight into the production and marketing problems of wheat in India with special reference to Punjab. The study endeavours to ascertain the factors associated with wheat revolution and an attempt has also been made to quantify the effect of various variables which caused fluctuations in wheat yields. Again, it examines the price policy for wheat during the past decade to evaluate the various approaches with a view to finding out an intervention level of price of wheat.

The second part of the book dwells upon the methodology, assumptions and limitations of the study. The basic data used for the micro level exercises are that collected in the Studies in the Economics of Farm Management in Ferozepur district, Punjab during 1967-68 to 1969-70 and that collected under the Comprehensive Scheme of Cost of Cultivation of Principal Crops in Punjab from 1971-72 to 1973-74. In the analysis pooled data from the above two studies having different sampling designs have been used and that puts certain obvious limitations to the validity of the results obtained. Apart from this, many would not find the adoption of weights for calculating fertilizer price indices on the basis of recommended doses for NPK very convincing.

There were quite a large number of factors which were responsible for the dramatic break-through in wheat prouction in Punjab. Out of these, according to the author, the switch-over to Mexican varieties of wheat coupled with assured remunerative wheat prices, increased consumption of fertilizer and the availability of irrigation facilities were the most important variables. It is concluded that the tremendous progress in wheat production in Punjab was mainly due to the increase in wheat yields. In spite of this progress, the production function analysis of the farm level data indicated that many of the wheat farmers in Punjab were still operating at low levels of input uses and could benefit by their more intensive use. It would have been better had the author tried to explain this low use of inputs on certain farms so that effective steps could be recommended for improving the input use on such farms.

Although many may not agree with the way the marketed surplus has been defined in the study, in Punjab the marketed surplus, which is taken to be equal to market arrivals, as percentage of production increased from 32 per cent during 1964-65 to 1965-66 to 57 per cent during 1971-72 to 1972-73. The production elasticity of marketed surplus was 1.6 per cent on the basis of micro level analysis and the elasticity of marketed surplus of wheat with respect to its price has been estimated at about 0.45 per cent. This, according to the author, clearly demonstrated the positively sloping supply curve for the Punjab farmers. Here, it is important to note that during the period covered in the study both prices of wheat and its production have been almost continuously on the increase. The farmer's consumption function analysis indicated that the price of wheat did not significantly influence the consumption of wheat, though the price and consumption had negative relationship. Chapter 5 deals with the price policy for wheat. The author has tried to find the intervention levels following the cost of production and parity approaches. However, any proper evaluation of the price policy followed in the case of wheat should be made only in the context of overall price policy followed during the period of analysis. The author concludes that the positive price policy of the Government in the mid-sixties stabilised the prices and encouraged farmers to adopt new wheat production technology specially at that time. The author has also made an attempt to discuss the effect of the increased differences between market prices and procurement prices during the years following 1971-72 which adversely affected the procurement drive.

This painstaking and in-depth analysis of wheat production, marketing and the price policy is a welcome addition on the subject of wheat revolution and would prove useful to scholars engaged in research on problems in agricultural marketing and price analysis.

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Rice Marketing System and Compulsory Levies in Andhra Pradesh: A Study of Public Intervention in Foodgrain Marketing, K. Subbarao, Studies in Economic Development and Planning-22, Institute of Economic Growth, Delhi; Allied Publishers Pvt. Ltd., New Delhi-2, 1978. Pp. xvi + 173. Rs. 50.00.

The study sets forth the twin objectives of examining the economic efficiency of the prevailing paddy/rice marketing system in Andhra Pradesh and evaluating the impact of public intervention through compulsory procurement of paddy/rice on the producers as well as processors. It provides a helpful discussion of the factors influencing the competitive marketing system and of the influence of compulsory procurement at lower than open market price on the returns to producers.

The author endeavours to do these two tasks mainly depending upon the primary data collected from a sample of 101 rice producers spread over in five predominantly rice growing villages in West Godavari district, though secondary data are used quite sparingly. It is curious enough that the author could find 26 cultivators from his sample who were having operated holdings below 5 acres each not reporting any marketed surplus at all, and at the time of analysis the data collected from the remaining 75 cultivators were depended upon. It should be noted that under the normal productivity conditions, the farmers having more than 2 acres of rice land produce marketable surplus even in low rice productivity areas like Shimoga and Raichur in Karnataka. In high rice productivity areas like Mandya, the farmers having more than one acre of rice land produce marketable surplus. West Godavari being a high rice productivity district, it would be logical to expect the rice growers there to produce marketable surplus at least at above one acre of rice land, if they are to be on par with Mandya farmers. There could be some special circumstances during the survey year for the sample rice growers from West Godavari not producing marketable surplus upto 5 acres of holding, but the author does not specify such circumstances.

The second important shortcoming of the primary data is the absence of knowledge about the brokers and the wholesalers at the village level. Marketing is a two-way transaction where the producers sell the commodity and the traders directly or through the brokers buy it for further processing before releasing it to the final consumers through the network of retailers. In this respect, quite often the rice millers play a very important role as the super dealers. Some case studies of the brokers and the wholesale dealers at the village level and also the private rice millers who control the commodity after processing would have been of much help in understanding the conditions of rice marketing. It would also be useful to have information regarding the nature of the relationship between the rice producers and the brokers/wholesale dealers with a view to knowing about the fixation of price. It is strange that the author has not collected any information in this respect.

While anatomising the marketing system at the village level the author gives certain narrative information which is insufficient to understand the actual system at operation. Mere figures regarding the number of wholesale dealers and brokers, the distance of the village, the storage capacity available, etc., would not be of much use in understanding the competitive nature of the marketing system. At this stage, the study lacks the research perspective in collecting proper information and putting it in an analytical frame.

However, the author comes out of this deficiency in the second part of his thesis which deals with the impact of public intervention in rice marketing through compulsory procurement of paddy/rice. It has been successfully demonstrated that the producer levy does not involve real income loss. The weighted prices (the open market price as well as the levy price weighted on the basis of quantity sold) realised by the rice growers appear to be not less than the prices that would have prevailed in the absence of levies. The exercise done by the author to prove this is really of high research calibre. In this regard a small arithmetical

error may be pointed out with reference to Table 7 in Chapter 6. The level of price flexibility of coefficient implied if P_0 were to be equal to PW, according to the calculation done by this reviewer, would be 0.107 and not 0.17 as arrived at by the author. This error, if it is real, however does not come in the way of the conclusions arrived at by the author.

Finally, the author arrives at an inevitable conclusion that there is no alternative to compulsory levies on the producers and rice millers at least in the near future. Even when the compulsory levies of rice are fully realised the weighted price realised by the growers would be equal to or more than the prevailing open market price in the absence of levy collection. It would have been more useful for the policy maker if this exercise would have been extended further to arrive at an optimum level of levy to be collected from the rice growers which would have given a weighted price equal to the prevailing open market price in the absence of levy. The present exercise is helpful in justifying the levy burden as it is presently imposed. Regarding the other conclusions like the case for nationalisation of rice millers, opening of new huller mills when the existing mills are under-utilized and the role of co-operative processing societies, etc., are no doubt useful but such conclusions do not require the type of research exercises done in this study.

Some of the comments made above are not intended to detract from the research value of this important study. The comments should be taken as certain minor guidelines helping further modifications. No doubt the study which has been neatly brought out will be of immense use to the students of agricultural marketing as well as the policy makers.

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Energy Resources and Economic Development in India, Wallace E. Tyner, Martinus Nijhoff Social Sciences Division, Leiden, Netherlands, 1978. Pp. xv + 139. Dfl. 40.00.

The book under review is a comprehensive evaluation of India's energy resources and provides a perspective of future development possibilities. Alternative policy options are presented in the analysis of different energy resources. These options provide a set of overall policy suggestions for development of energy supplies in India.

The study is mainly based on existing literature and well-known data. Therefore, it does not provide anything new to the specialists. However, the contribution of the book lies in critical evaluation of available evidence and in giving the reader a perspective on the current status of all possible policy alternatives for meeting the projected energy requirements of the country.

The first three chapters give historical account of energy resource deve-

lopment in various Five-Year Plans and the potential magnitude of energy sources available to the country. This provides the basis of analysing the current and potential future energy supplies and required policies in the next three chapters. Chapter 4 presents a mathematical model for evaluating various offshore leasing arrangements for petroleum development. Using the leasing model developed in the study, the Indian leasing system was compared with the following alternative systems: (1) U.S. bonus bidding system, (2) Annuity capital recovery profit share system, (3) British type profit sharing system, (4) Variable rate royalty system, and (5) Peruvian leasing system. The Indian leasing system has been found superior to other systems in terms of national economic advantages. Although the initial experience of leasing offshore areas to foreign petroleum companies for exploration and drilling has not been very encouraging[1], the analysis presented in Chapter 4 will be of considerable help in future negotiations.

Two important conclusions emerge from the analysis in Chapter 5: (1) The forecasting procedures currently being used in India result in forecasts which under-estimate the demand because they are based on the period when the supply was constrained. (2) To relieve power shortages and assure an adequate reserve supply, the installed generating capacity needs to be increased at a much greater rate than planned. These findings are of utmost importance in deciding about the rate of installation of generating capacity in the light of the targeted rate of industrial growth during the Sixth Plan. In this context, the rate of development of hydro potential in India also needs to be adequately stepped up.

Chapter 6 dealing with bio-gas and other alternative energy sources lacks the required depth of analysis. While the potential of bio-gas and solar energy sources in meeting the needs of rural India in a decentralised way is recognized, the analysis does not include recent developments and data. The potential of social forestry in meeting fuel requirements of the household sector is not at all discussed.

The last chapter lacks proper integration of each resource development with the overall future demand of energy both in the urban industrial and household sectors as well as the rural sector. The policy options have, however, been related with the potential for development of each resource.

These deficiencies in analysis do not, however, mar the value of the book to the scholars and students in the area of natural resources. It should also be of considerable use to policy makers in providing a perspective in energy planning consistent with the targets of industrial and agricultural growth.

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1. Two such deals with foreign oil companies have been abandoned by these companies and the responsibility of oil exploration has gone back to the Oil and Natural Gas Commission. Informed sources indicate that many more such offers are not even forthcoming.