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# INDIAN JOURNAL OF AGRICULTURAL ECONOMICS





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# **BOOK REVIEWS**

Operations Research Methods for Agricultural Decisions, R. C. Agrawal and Earl O. Heady, The Iowa State University Press, Ames, Iowa, U.S.A., 1973. Pp. x + 303. \$ 10.95.

In the past few years, the theory of Operations Research has been considerably enriched by many significant technical breakthroughs. Applications of these techniques are many and varied in different industries. New OR techniques continue to be evolved. However, there are few relevant books on OR techniques presently available to students of agriculture. The book by Agrawal and Heady makes a sincere attempt to fill this gap.

This book is a systematic treatise on OR techniques applied to agricultural decision-making. The book has 13 chapters. The first seven chapters are devoted to mathematical programming and game theory. These topics as others like inventory models, queueing, and network analysis covered in the remainder of six chapters are presented in a capsule form, but the treatment given is sufficiently deep. Topics on non-linear programming are not adequately covered, while transportation models and assignments problems are altogether ignored. The game theory is discussed at length. The last two chapters on Linear Functional Fractional Programming and Simulation are very short and do not provide adequate insights into these topics.

There can be little guarrel with the theoretical correctness of the OR techniques presented in the book. The book makes a unique attempt to illustrate the application of OR techniques to agricultural situations and identifies problem areas where their application is feasible. The illustrations are drawn from altogether different agricultural situations, viz., the US and Indian agriculture. This has, however, limited the usefulness of the book as the illustrations are often mixed with the presentaion and the switch-over from one situation to another, with differing units of measurements, is too rapid and confusing. In identifying problem areas amenable to the application of OR techniques, the authors have not properly underscored the need for an improved information gathering system and managerial judgement in operationalizing policies stemming from optimal results obtained from the application of these models. Further, the discussions on agricultural applications are not complete perhaps because applications of OR techniques except programming models are limited. To this reviewer, therefore, the utility of this book is limited to agricultural students and researchers for they may find it easier to understand OR techniques by examples drawn from agricultural situations. Otherwise, techniques as such are discussed in a

much simpler and straight-forward manner in Heady and Candler,<sup>1</sup> Hillier and Lieberman,<sup>2</sup> and Kwak.<sup>3</sup>

Depsite the authors' claim in the Preface that the level of mathematical treatment assumed in the text is low, considerable mathematical maturity is necessary to follow the text. In terms of mathematical rigour, this reviewer would place the book above Heady and Candler, Hillier and Lieberman, and Kwak. These three books continue to dominate the market. However, this book is likely to prove a good reference-cum-review reader for those who have been exposed to OR techniques in an earlier introductory course. The book is well organized, logical, and free from notational errors. It has excellent cross referencing and a comprehensive appendix on mathematical review.

V. N. Asopa

Agrarian Reform and Agrarian Reformism: Studies of Peru, Chile, China and India, Edited by David Lehmann, Faber & Faber, London, 1974. Pp. 320. £1.80.

Land Reforms in India: Trends and Perspectives, P. C. Joshi, Studies in Economic Growth, No. 19, Institute of Economic Growth, Delhi, Allied Publishers Pvt. Ltd., New Delhi, 1975. Pp. xiii + 181. Rs. 15.00.

"When men who otherwise disagree on fundamental political values agree on an issue of importance, they are probably using crucial terms in widely differing senses," remarks Lehmann in his Introduction to the first book under review. Indeed land reforms have covered a variety of policy schemes and their appraisal is strongly influenced by the ideological viewpoints. What appears now to be universally accepted, whatever may be the particular political predelictions that shape the policies, is that no developing country can escape the formulation of some kinds of land reforms. The objectives may vary from that of obtaining political control, increasing 'productive efficiency,' assuring rapid industrialisation or furthering social equity. Whether consciously recognized or not, the objectives, the contents and the implementation of the programme cannot escape revealing the class interests at play, both of policy-framers and within the agrarian economy subject to the reforms. The first book brings together experience of Peru, Chile, India and China in the The essay on agrarian reform and military reformism in Peru by Ramon Zalvidar and agrarian reforms in Chile 1965-72 by David Lehmann are interesting to Indian readers for their review of the chronological political

<sup>1.</sup> E. O. Heady and Wilfred Candler: Linear Programming Methods, The Iowa State University Press, Ames, Iowa, U.S.A., 1958.

<sup>2.</sup> F. S. Hillier and G. J. Lieberman: Introduction to Operations Research, Holden-Day, Inc., San Francisco, 1973.

<sup>Inc., San Francisco, 1973.
3. N. K. Kwak: Mathematical Programming with Business Applications, McGraw-Hill, New York, 1973.</sup> 

developments and their impact on policy-making in these two countries which have seen political upheavals. They provide useful information, although analysis is not their strong point. The article by Shillinglaw focusses on a certain early phase (1947-50) of land reform—termed 'capitalist' by the editor in the Introduction, 'liberating productive forces and human beings from the extra-economic constraints exercised by landlords'-in Southern China. It is a detailed and meticulous account of things as they happened and gives insights into the process of changes attempted and attained but by itself covers neither the most significant phase nor the most crucial problems in the Chinese experiments. It is on India that the book lays relatively greater emphasis. D. P. Chaudhuri's discussion of new technologies and income distribution in agriculture relies upon neo-classical tools to analyse income distributional effects of the new technologies. While not based on any original work, it attempts assimilating results of a wide range of studies on green revolution to highlight the tendencies towards increasing income differentials. The essay presents no fresh insights nor new tools of analysis. Clive Bell's discussion of the ideology and class interests in Indian reforms is an attempt to analyse the class structure of the urban and rural sectors, the potential conflicts in the interests of the urban bourgeoisie and the landlord and Kulak classes, the diverse objectives of land reforms and their mutual compatability, etc. The essay suggests a number of hypotheses with illustrative references to actual developments but remains unfortunately at much too an abstract and speculative level. While thus proposing a number of potential developments in terms of class conflicts and alliances, the essay neither exhaustively treats historical material nor systematically follows actual developments. The two articles that stimulate controversy mutually by taking strong positions are by Byres on the implications of the land reform programme as a generator of marketable surplus pre-conditioning industrialisation and by Michael Lipton on a theory of land reform. Byre's essay goes intensively into the question of marketable surplus—its farm sizewise distribution and implications of a land distributional strategy for the generation of marketable surplus. He examines the possible effects of ceiling legislations, tenancy legislations, co-operativization on the marketable surplus. As of actual developments he sees "the most important contradiction in the Indian socio-economic system in coming decades is that posed by an urban bourgeoisie intent upon industrialization but frustrated by a strong and increasingly powerful class of rich peasants and small and medium landlords, on their way to becoming capitalists and exercising political power." The alliance between bourgeois-landlord was bound to face inherent conflicts of interest. The issue of marketable surplus, Byre feels, has been relatively neglected in the discussions of Indian land reforms. Lipton advocates with considerable passion the case of land redistribution, both in the interest of efficiency and equity. He believes that, considering that small farms have been found to possess greater productivity of land, given further the possibility of using new technologies and innovations even on small and medium farms, provided the institutional factors favouring the big landlords in the use of credit, scarce

inputs, irrigation facilities are taken care of, there is no reason why such a redistribution should affect output or marketable surplus adversely. Lipton's discussion is even more hypothetical in the sense that he does not draw out fully either the empirical implications of the redistributional scheme and discuss the operativeness of the programmes to aid small/medium farms nor does he elaborate on the historical validity of his premises or the operational feasibility of his proposals. Japan and Taiwan, the cases he quotes, are certainly special cases and he does not indicate the distinctiveness of these examples. The articles on India in this book thus remain much too on a theoretical plane in contrast to those on Chile, Peru and China and none gives a thorough account of what has happened of the land reforms in actual operation.

The book by P. C. Joshi is a useful guide to a researcher as it provides an exhaustive list of references to literature. In Part I, Joshi gives an account of agrarian studies carried out before and after Independence. He focusses mainly on the methodological aspects and points out in greater details the shortcomings in approaches and the major lacunae in fields of study. refrain of his complaints seems to be that the available studies, especially after agrarian studies got professionalised in the post-Independence period, tend to transplant alien methodology, concepts and assumptions into the Indian context; that they often tend to ignore the regional variety; that they tend to be narrowly uni-disciplined not sufficiently integrating sociological, anthropological, political and economic dimensions. Unfortunately, Joshi's criticisms remain at a rather abstract level and while the negative features are highlighted, one remains unclear as to the constructive aspects of his suggestion. (For example, how does one take account of cultural aspects in class-based analysis?) Also even though the major references to literature are exhaustively dealt with, the reader gets a very sparse idea about the results of these studies, the contents of controversies, the major contributions that have held the field. In this, his section I on agrarian studies before Independence scores better.

K. B.

Report of the Study Team on Overdues of Co-operative Credit Institutions, Agricultural Credit Department, Reserve Bank of India, Bombay, July 1974. Pp. 360.

Accumulation of overdues can be considered to constitute a major problem afflicting credit institutions, particularly the co-operative societies. They have already touched a dangerous level, a little less than half the amount of outstanding loans represents overdues. If allowed to accumulate further the very activity of credit for financing agriculture will slow down or halt. That the inevitable has not happened is no excuse to overlook or consider the problem lightly.

Datey's Team has studied the problem of overdues from all angles. The Team has asked questions such as: (i) whether the natural calamity was responsible for accumulation of overdues, (ii) whether a high proportion of area under irrigation promoted more regular payments, (iii) whether commercialisation of agriculture, as represented by the extent of area under commercial crops, encouraged better behaviour of borrowers, (iv) whether small size of holding of the borrowing members was responsible for the poor repayment performance and (v) whether the size of the society and existence of full time paid secretary kept low the proportion of overdues. These questions have been examined by the Team both for the Central Co-operative Banks and the Co-operative Credit Societies. It has come to the conclusion that except the last factor, viz., the small size of the society and the absence of full time paid secretary, none other could explain convincingly the accumulation of overdues. In other words, the economic factors and the factors like natural calamity are less relevant but the organizational weaknesses like the non-viable size of the society and the absence of full time paid secretary are responsible for the near catastrophe like situation in the co-operative sector. This is well taken. Several Committees in the past have expressed this view.

The Team has devoted a good deal of thought for evolving suggestions for measures to meet the situation. The measures carry in them the maturity and wisdom accumulated over years of administration. The measures if carried out faithfully will provide relief and rehabilitation to non-wilful defaulters and punish those who indulge in wilful default and thus harm the cause of co-operation. While the Report reflects the detailed work undertaken by the Team both regarding analysis and formulation of remedial measures, both may fall short in satisfying either the research workers or credit administrators. Research workers would have expected the exercise regarding the analysis of the causes of overdues to be more rigorous. Credit administrators may want the measures to be based on analysis so that they have new content with more meaning.

Taking individual factors like irrigation, or crop failures, it has been shown that they were not associated with accumulation of overdues. The exercise is reinforced by illustrations from individual States, districts and Central banks. Is it not likely that where crop failures are frequent, where creditworthiness is low, where cash crops cover smaller area, there the societies have low turnover, their ability to pay for full time secretaries is low? All these factors therefore may be inter-related. Similarly, better performance may be due to better economic conditions of farmers which may be due to irrigation. The individual factors that either fail to explain or that seem to explain may together throw light as to their explanatory power. Unless a rigorous exercise is carried out to isolate the influence of each factor and to measure the overall explanatory power of factors taken into account—in a regression exercise—, no research worker will be convinced about the worth of the insight into the problem provided by the broad exercise. The Datey Team's work is com-

mendable in that it goes farther than many such reports have done in the past, but unfortunately despite elaborate exercise little tangible gain in knowledge obtains.

A bigger problem is involved than one analysed by the Team. Is credit not linked with production? 1971-72 and years prior to it witnessed a beginning of an important technological breakthrough in the form of 'Green Revolution.' Between 1961-71, the use of seeds, fertilizers, pesticides and machinery for water lifting expanded rapidly. In some States, like the Punjab, the use of tractors made a commendable progress. Irrigation is the only major input considered by the Team while analysing the factors associated with overdues. Irrigation, as we know, is a vague concept. In many instances irrigation is a stand-by, to supplement rain water when rains fail; in a few other cases it proves only a fair-weather friend, canals dry up when rains also fail. Assured supply of water and irrigation are not synonymous in the statistical records we maintain. Further the repayment capacity will be related to income and income will depend on wise or productive use of credit. Was credit wisely given and effectively used? The use of other vital inputs, and total production level at various levels including individual borrowers may have to be related in an analytical exercise to credit obtained and used.

An important finding of the Team is that in about a decade, while the membership of co-operatives increased from 20 millions to 32 millions, the number of borrowing members remained unchanged, around 10-12 millions. their proportion to the total members declining from 51 per cent to 35.6 per cent. This is a major problem that stares us and the Team in the face for explanation. How has the composition of borrowers changed over the period? Does constant number of borrowers imply an entirely new set, or the same set or mixed set of borrowers at a later date? Do overdues prevent a larger number of borrowers from fresh borrowing and are they replaced by borrowers from newly enrolled members? An analysis of borrowers, their standing as members, their regularity in repayment, would have thrown direct light on the problem of overdues. If overdues have accumulated at a rapid rate and the number of borrowers has remained constant, does it mean that a set of interested borrowers have misused their position to appropriate the funds of The Team concludes: "The conclusion appears to be inescapable that lack of will and discipline among cultivators to repay were the principal factors responsible for the prevalence of overdues in the cooperatives. Defaults were, by and large, wilful. The defective lending policies pursued by the co-operatives, the apathy of the managements in taking quick action against recalcitrant members and above all, the absence of a favourable climate for which the State Governments were found to be responsible to some extent had served as contributory factors." The conclusion is telling but has no quantitative basis. Despite elaborate exercise, we do not get even an estimated number of those from whom loans are overdue.

The remedial measures suggested by the Team are of three types: (i) relief and rehabilitation, (ii) punitive measures and (iii) reorganization. The emphasis has been on automaticity of recovery, rather than increased repaying capacity, better credit utilization, and above all better servicing of the borrowers.

Those who have defaulted because of their inability to repay need help. The Team has suggested various concessions, depending on whether the defaulters have suffered because of continued natural calamity like crop failure. According to the Team's suggestion, a part of the debt can be scaled down, a part can be brought under moratorium and/or converted into medium or longterm loans. The Team has emphasized measures despite their conviction that overdues reflect largely the absence of will to repay. For the latter, those who are found to be wilful defaulters, the Team has prescribed punitive measures, for instance, it suggested they should be charged punitive interest rates. Coercive process prescribed under law can be evoked against them to improve recovery. The Team has recommended that land and implements of defaulters should be auctioned and if buyers are not readily forthcoming State Farming Corporations should be formed to make the threat real and effective. All these measures do not help to change the climate for credit, at best they treat the disease by symptom. Automaticity of recovery has weighed much with the Team. It has recommended that, whether member or nonmember, all those who sell their produce either through a marketing co-operative society or a trader or any other private agency should obtain from the co-operative society 'permission for the transfer/sale of agricultural produce.' Unless this certificate is produced, the Team suggests, no cultivator should be permitted to 'offer his produce for auction/sale in a mandi/regulated market.' All members have to obtain the certificate irrespective of the fact whether they are borrowers or not and whether they have repaid fully the loan borrowed or not. This is a real 'punitive' measure, punishment being more to a large number of non-members and non-borrowing members and also to those who are regular in repaying their loans. This can be concretely illustrated. The total number of cultivators (cultivating families) in 1971 may be placed around 50.4 millions.\* Of them, 32 millions were members of co-operatives and 11 millions borrowed loans. If half of them had not repaid loans (considering that a little less than half of the loan outstanding was overdue, to be exact 44 per cent), those not regular in repaying loans would constitute about 10 per cent of the total cultivators. Year after year, for every transaction entered, 90 per cent of the cultivators will have to produce certificates of co-operative societies, a punishment to them for misdeeds of 10 per cent defaulting cultivators. Besides, the borrowers will get only part payment of their sale proceeds, the rest to be transmitted to credit co-operatives towards loan accounts. The tripartite settlement of accounts involving the society, cultivators and traders/marketing societies, at the end of the year will involve

<sup>\*</sup>Source: All-India Debt and Investment Survey 1971-72, Statistical Tables, Vol. I (All-India and States), Reserve Bank of India, 1975, p. 17.

complicated accounting procedure. The magnitude of complication can be imagined at once if it is admitted that there may be more than one transaction between the same cultivator and the trader and that the same cultivator may have transactions with more than one trader.

The 'disease' of overdues is real and formidable. It has to be fought. But punitive measures may not be sufficient deterrents, it may create more problems than it might solve. From this point the organizational measures suggested by the Team are commendable. They do not, however, go far enough. Probably experience, maturity and involvement with the co-operative movement have persuaded the Team to proceed with caution. relevant and necessary that the size of the society should be large enough to permit employment of paid staff on full time basis. But the present structure cannot bear that weight. One of the three tiers of the organization has to be dropped if efficiency has to improve. Since the primary unit has failed in its function and allowed the problem of overdue to grow unchecked and since co-operation means no more than a label to a majority of the primary societies, it is the dead weight of the non-functioning, inefficient, lowest tier that may have to be dropped. With improved communications the credit outlets need not be at the door step of the peasant, it should be only easily accessible. However the programme for collapsing tiers may be phased.

The Team did consider 'cash credit' system to be adopted but showed reluctance in recommending it. To the Team the lowest tier seems important. The primary society cannot obviously bear the weight of the 'banking operations' of cash credit type. But can progress in the adoption of 'banking operations' for credit management be postponed for long?

The Report of the Study Team is commendable. The analysis surely could have been more sophisticated but even in its present form the Report provides a wealth of information. The recommendations of the Team are not bold, but they do contain a lot of wisdom borne out of experience. Some of them would mean hardship to a large number of cultivators if implemented but others if implemented in good faith will certainly improve the credit administration. The reading of the Report would convince that there is need for paying increased attention to the problem of overdues in understanding its causes, its deeper malady through further analysis and in adopting more radical measures that will root out the basic problem of agricultural finance rather than its symptom.

C. H. Shah

Resurvey of Matar Taluka, Vimal Shah and C. H. Shah, Vora & Co., Publishers Private Ltd., Bombay-2, 1974. Pp. xviii + 336. Rs. 40.00.

Although the importance of surveys and resurveys has been recognized in India for understanding and interpreting the content and direction of change taking place in the rural areas, this type of research has not received the attention it deserves from the senior cadre of professional economists in the country. Such work is often treated as second class research to be handled by relatively junior research workers. That this type of work, to be worthwhile, really needs the talent and maturity of senior professionals is amply demonstrated by the publication of Resurvey of Matar Taluka. This book provides an outstanding example of how some really worthwhile and meaningful results can be derived through the painstaking efforts of distinguished and experienced research workers.

The bench-mark survey of Matar taluka in the Kaira district of Gujarat was carried out by J. C. Kumarappa, a noted Gandhian economist. This study, sponsored by the Gujarat Vidyapeeth, was primarily undertaken with a view to assessing the burden of land taxation in relation to the prevailing economic conditions of the farmers. The reference year for the first survey was 1929-30. The resurvey of Matar taluka, prepared by Vimal Shah and C. H. Shah, was sponsored by the Research Programmes Committee of the Planning Commission with a view to find out the changes in the level and pattern of development and to identify the main sources of development in the taluka. The reference year for the resurvey was 1965-66. Both the surveys are based on a fairly large sample, the benchmark survey covering 1,112 households and the resurvey 998 households. The resurvey report has been divided into 17 chapters. A wealth of statistical information has been provided through 101 tables in the text and 29 tables in the Appendix. The resurvey report is thus fairly comprehensive and throws useful light on the numerous aspects of the changing rural economy such as demographic features, structure of land holdings, cropping pattern, resource base, production and disposal of output, structure of assets, debt burden and levels of living.

It would be impossible to narrate in this short review the numerous interesting results provided by the resurvey report. However, some of the important conclusions emanating from the study may be recapitulated. a noteworthy conclusion emerging from the study has been that the structure and size of holding have remained unchanged in spite of the substantial rise in population (100 per cent) and labour force (around 60 per cent) between 1929-30 and 1965-66. Secondly, the general level of prosperity in the taluka has gone up over a period of 35 years. Both the improved terms of trade for farm produce and a higher level of production have helped in achieving an impressive increase in income. The available evidence, both quantitative and qualitative, suggests significant improvement in the level and pattern of consumption. Conclusive evidence has also been cited to prove that though much has been achieved, much more remains to be achieved. Thirdly, the report confirms the historical experience of widening inter-group and interregional inequalities with economic development. The farming group has benefited more than the non-farming group. Among the non-farming occupations, the agricultural labourers have benefited the least, while others

have gained moderately. In the farming group, the big farmers have benefited more than the small farmers. Fourthly, though the area under cultivation and yield per acre have increased perceptibly, the agricultural development till 1965-66 was, by and large, on the traditional lines notwithstanding "small but significant changes" reported in the production techniques and the development of "production oriented outlook." Finally, the authors have identified irrigation as the most important force of change. This is clearly reflected in the fact that among the three regions of the taluka, the Navagam region, which benefited the most from the extension of irrigation, reported the highest rates of growth in production, income, investment and consumption. The impressive progress of education and co-operation and development of transport and electrification have been identified as the other important growth contributing factors in the region.

There are two distinct features of this report which deserve to be noted. Firstly, such surveys are usually carried out by selecting normal reference periods so as to permit comparison. The present report is unique in the sense that both the benchmark (1929-30) and resurvey (1965-66) years were abnormal. The comparability of data would therefore depend upon the nature and extent to which the taluka economy was adversely affected during the given reference periods. Secondly, the methodology adopted in the benchmark survey can hardly be regarded as perfect by modern standard. The "meticulous care" of the author and the "excellent rapport" with the people can not compensate fully for the lack of appropriate methodology, especially when a large amount of quantitative data had to be used for building up a comparative picture. The authors of the present report have faced here a tremendous challenge in weighting the available evidence and selecting the relevant data from primary and secondary sources.

A study such as this covering a fairly long period is bound to throw up some posers which can not be easily explained. For example, a decline in the percentage of total produce sold with an increase in the size of holding reported for the year 1929-30 (Table 9.2, p. 128) is difficult to explain. Similarly, an important conclusion highlighted in the report regarding the increasing inequalities with development may have to be accepted with caution. While the available evidence regarding the consumption pattern appears consistent and generally supports the above conclusion, the income data can not be regarded as equally firm. One has to keep in view two important points while comparing the pattern of income distribution over the given period. Firstly, the focus of the benchmark survey was primarily on the farm households and, therefore, information collected about the non-farm households was limited. Even among the farm households, the representation of medium and large cultivators was relatively much larger than would be warranted by their proportion in the total (p. 40). Secondly, the increase in per capita real income (measured in terms of kg. of paddy) over the period of 35 years shows extreme variations among various occupation groups such as cultivators

(592 per cent), agricultural labourers (16 per cent) and other non-farm families (105 per cent) which can not be easily explained (Table 12.5, p. 168). haps the big jump in the cultivation income may be due to some under-reporting by the medium and large farmers in the bench-mark survey. authors have provided some explanations for the variations in income levels of farm families in 1965-66 over 1929-30 (p. 254). However, what is not explained is the wide variation in incomes among various farm size-groups The prevalence of famine conditions in 1929-30 cannot explain the wide variations in per capita real income reported for the small farmers with 0 to 5 acres (+122 in terms of kg. of paddy), medium farmers with 15 to 25 acres (+68) and big farmers with holdings above 35 acres (-44) (see Appendix Table 29). If, in spite of several such limitations, we are getting the best out of the available data, the credit rightly belongs to the painstaking efforts and ingenuity of the authors. The authors have made a valuable contribution to the limited literature available on the subject.

MAHESH T. PATHAK

## ARTHA VIJNANA

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