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## BOOK REVIEWS

*Idle Labour in Village India*, Kanta Ahuja, Manohar Publications, New Delhi-2, 1978. Pp. xv+160. Rs. 50.00.

Agriculture in India has reached a stage of development, where it is being looked upon not merely as an activity supplying food for increasing population but also as a potential source for generating productive employment for the increasing labour force. As a result, the problem of labour utilization in agriculture has been engaging the attention of many research workers in recent years. Any study on the labour time disposition in agriculture, therefore, has a great timely significance for the purposes of devising the strategies for employment generation. In this context, the book under review which is based on an intensive labour time disposition survey conducted by the author in five villages of Rajasthan during 1971-72, is a welcome addition to the existing literature on the subject. It attempts to study (i) the conceptual problems of measurement of unemployment and surplus labour; (ii) the various forms of under-utilization of labour; and (iii) the size of unemployment and factors determining it among households.

Reviewing the various estimates of surplus labour based on poverty, time and availability for work criteria, the author brings out meticulously as to how the estimates of surplus labour differ from one criterion to another. Taking the income level of Rs. 30 per capita per month as the poverty line, about 13 to 47 per cent of workers among the selected villages belong to this category. The percentage of population below the poverty line is found to be even higher, *i.e.*, 22 to 50 per cent, indicating thereby a high ratio of dependents to earners among poor households. On this basis, it has been inferred that "the poverty and employment dimensions be kept apart both analytically as well as for purposes of policy formulation" (p. 11.) Since employment dimensions are referred in relation to poverty, which could be reduced by generating more employment, one gets the impression from the above statement that poverty and unemployment are not coterminus. But the evidence elsewhere has shown otherwise. On the basis of NSS data from 25th and 27th Rounds, it has been observed that a low standard of living goes with a high rate of unemployment. This observation to a certain extent could be further supported from Table 3.3 of the book, which indicates that out of four in two villages, the unemployment rate of male workers happens to be higher in the lowest per capita income group, *i.e.*, below Rs. 360 per annum. In the case of another village the differences in unemployment rates among income groups are quite small, being 31 to 38 per cent. Only one village provides an exception, where unemployment is found to be higher at 18 per cent among the highest income group, *i.e.*, above Rs. 720 and at 12 per cent among the lowest income group. It may, however, be pointed out that for regions having low standard of living with high unemployment, merely the programmes of employment generation would not solve the problem, what is required is higher investment to raise the productivity of labour as well as wages and, income levels.



Coming back to the estimates of labour, when the persons working less than 48 hours a week are categorised as under-employed (time criterion), such persons have been found in a quite substantial number in all the villages. However, on the basis of average hours of work according to usual activity, large number of workers had work for more than the norm of 48 hours in one week throughout the year, indicating thereby that there does not appear to be much of under-employment. Further, on the basis of number of days worked for all the quarters, 18 to 53 per cent of male workers and 5 to 30 per cent of female workers are fully employed in different villages, whereas 20 to 40 and 23 to 69 per cent of male and female workers respectively have been under-employed. If the non-availability of work in this situation is taken as unemployment, it turned out to be very low; less than 4 and 5 per cent for males and females respectively. But the persons with usual activity status of workers have shown higher unemployment rates due to non-availability of work ranging from 0 to 29 per cent in different villages. These estimates clearly show that the unemployment and under-employment rates differ quite substantially by changing the criterion of measurement.

Having shown the variations in unemployment estimates, an attempt has been made to explain the differences in unemployment (measured as idle time in relation to a full time norm) with the help of selected variables, which have been broadly classified as resource availability, type of activity and composition of labour supply. Based on different sets of regression estimates, it has been observed that the resource availability, larger activity of any kind, and labour hired out reduce unemployment. Further, along with the type of activity, the mobility variables improve the explanatory power of the models. The results appear to be quite all right at a first look. But after giving a closer scrutiny to the regression estimates presented in Tables 3.10, 3.11, 3.13 and 3.14, it becomes rather difficult to accept them for the obvious reason that among the estimated equations, half have very low explanatory power ranging from 1 to 23 per cent. Further, the variations in the values of  $R^2$  have been so wide that it is difficult to draw any meaningful inference. For instance, in the case of Somalsar village, in the regression estimated with eleven variables the  $R^2$  turned out to be as high as 0.87 but no variable was found significant (Table 3.10). In the case of estimate based on three variables with one variable (value of asset per unit of labour) significant, the  $R^2$  increased to 0.99 (Table 3.11). But in another two equations with five and seven variables of which four variables have been found significant, the values of  $R^2$  turned out to be very low, being 0.06 and 0.10 (Tables 3.13 and 3.14). More or less similar is the case with the regression estimates for Lakhana and Naya Khajpur villages, though the variations in the values of  $R^2$  in different estimated equations have been lower. In the case of Netra, the situation is slightly different in the sense that the estimated equation with eleven, three and five variables have given the values of  $R^2$  only from 0.01 to 0.23. But when outward mobility has been added the  $R^2$  increased to 0.79 (Table 3.14). In Govindpura, in all the equations, the values of  $R^2$  have been quite low, ranging from 0.20 to 0.56. In view of the wide fluctuations and overall



low explanatory power of the models, it is difficult to draw any definite inference. It seems that only one type of unemployment estimate (which is indeed difficult to estimate particularly in view of the wide variations in unemployment estimates based on different criteria) aggregated at household level is difficult to explain with the variables chosen in the study. Something more systematic would have probably emerged had an attempt been made to explain the unemployment estimates based on each criterion separately with the help of selected variables.

In Chapter 4, the production function analysis has been attempted with possible refinement in the measurement of labour variable with a view to testing the zero marginal productivity hypothesis, so as to get an idea of surplus labour. Its existence in agriculture has been supported on the basis of regression estimate with the labour committed to farming defined by male and female workers in the households. The other measure of under-employment, which has been worked out by estimating the productivity of labour in a situation of equal distribution of land and resources, and finding the quantum of labour required to produce the existing level of output, has shown that only in two villages there has been substantial under-employment. In one village there is only a marginal surplus.

Districtwise estimates of surplus labour have been made by comparing the availability of labour with its requirement derived through the norms of labour use per hectare for each crop, based on Farm Management Studies. These norms have been applied to given size, intensity and cropping pattern of land cultivated in each district, so as to have the quantum of labour requirement and hence unemployment. The inter-district differentials in unemployment so estimated have been explained with the help of variables such as percentage of irrigated area, density of population, livestock per person, average rainfall and percentage of total cultivated land under *khari* crops. It may be mentioned here that the factors which could be important for explaining unemployment are, to a certain extent, already used for estimating it. Therefore, conceptually it does not stand to logic to use them again to explain unemployment.

In the last chapter the rural employment programmes such as the Crash Scheme for Rural Employment, Pilot Intensive Rural Employment Project, Drought-Prone Area Programme, Small Farmers' Development Agency, and Agency for Marginal Farmers and Agricultural Labourers have been very well reviewed. In this context, it is stated that rural public works would become important provided they are made an integrated part of rural development strategy. For transformation in rural incomes and employment, the reduction in the profitability of large scale farming and ensuring the productivity and viability of small farmers have been suggested.

An unusual thing about the book is that it does not have a chapter of summary and concluding observations which make the reader difficult to get the central theme discussed in different chapters.

Comments on some of the observations mentioned above in no way detract from the quality of the book. In fact, the study make a significant contri-

bution to the complex phenomenon of surplus labour in Indian agriculture. The other important aspect is that apart from a thorough analysis of the data from various angles, the study has a distinct theoretical framework. As such, the book is highly commendable and would be very useful to policy-makers and researchers.

V. N. MISRA

*Mechanisation of Indian Farming: Obstacles and Prospects*, Theodor Bergmann, Popular Prakashan Pvt. Ltd., Bombay-34, 1978. Pp. xii+132. Rs. 40.00.

Mechanization of agriculture is strongly influenced by a number of social and economic factors. Fortunately vast literature exists in this sphere. Still, the controversy over mechanization exists and we do not feel the earth below our feet. Against farm mechanization, it is argued by many scholars that it would replace labour which is already surplus in developing nations (India in particular). This would disturb the already disturbed, unequal and heavily skewed income distribution. The poor landless agricultural labourers would become poorer and the rich and big landowners would become richer. The argument in favour of mechanization is that it would solve three basic problems in the rural areas, viz., (a) the need for additional total annual employment for landless labourers, as it would help in increasing the crop intensity, (b) the need to reduce seasonal unemployment for those dependent on agriculture, and (c) the need for additional labour at key peak periods (such as planting and harvesting). (a) and (b) if solved would decidedly increase labour income. The book under review is an addition to the literature and hence adds to this controversy.

The book contains seven chapters, besides an epilogue, references, and the index. It is the result of two research tours conducted by the author in India, first in 1962 and second during 1969. The publisher started printing the book in 1972. But it saw the light of the day only in 1978. Whosoever is the defaulter, the ideas spelt out in the book have become 'matters of the past'. The author says that "the machines are designed for... large holdings... The farmers (are) quite wealthy and free from feudal bonds... Owner cultivation prevails... collective farming and State farms are typical for land tenure..." (p. 2). From this it can be inferred that if the ceiling on holding is to be imposed (as in India), some different machinery (other than what is available) is to be designed or this policy of ceilings on holdings is to be modified. Unless this is done we cannot make any headway in adopting the machines to our advantage.

In some pockets of the country (e.g., Punjab, Haryana) not only heavy operations of cultivation (reclamation, ploughing, levelling, etc.) but other operations such as sowing, spreading fertilizers, spraying insecticides, irrigation, harvesting, threshing, etc., have also been performed by machines.

Experiments in almost all countries (e.g., Philippines, Taiwan, India) which have adopted and which are adopting machines suggest that in the



initial stages machinery adoption and human labour employment have complementary relation, in that as the intensity of machine use increases on the farm, the intensity of labour use will also increase. With timely operations which are possible through machines, the yields have gone up and the intensity of cropping has increased; this has led to the higher demand for human labour (as tractor driver, casual labour and various increased farm operations, etc.). With the present mode of technology it is hoped that human labour demanded would further increase which is a healthier sign for economies like India (the Punjab model is in view for this argument).

The Planning Commission favours small tractors (p. 20). It is a must because the political policy of fixing ceiling on land holdings and the land to the landless policy are decidedly favouring smaller horse-power tractors. Even hand propelled, two wheelers might be more acceptable to such small farmers who may own around two hectares of land, provided this machine is made more versatile and elastic, in the sense that it might be used for all agricultural tasks. Such machines then would be more helpful in bringing about more area under double cropping and hence increasing the productivity of land and labour.

The main hurdle in the adoption of such diversified and easy to handle machines appears to be the tenurial system. If the tenant is operating, he may not be interested in handling such machines. In fact, many studies have shown that the use of improved inputs (including improved implements) is very much below the optimum level on tenant operated holdings—especially when the owners do not share the costs. Other factors like differences between regions, climate, soils, crops, etc., are of very minor importance in deciding the type, size and time of acquiring machines (tractors). Wherever tractors are uneconomical on farms, the tractor owners use them for such operations as transportation of agricultural produce from the village to the market place, ploughing fields of others on contract basis, etc. These practices help the owners to augment their income and make the tractor an economic proposition. It is also not rare to find in Punjab that the electric (or diesel) pumps for lifting water are owned jointly by a group (may be two or more) of small farmers. This is in no way due to the effort of service co-operatives. It is entirely because of economic compulsions which have forced them to 'go' that way.

The author's observation (p. 29) that "All the (tractor producing) firms are far from their licensed capacity or even their installed capacity" is true not only for tractor firms but for almost all big industries—especially operating in the public sector. The reasons for this might be lack of good management, low investment, lack of finance and aversion to risks. Once a decision is put off for a later date, it is a clear indication of incompetence, because the quality of a good manager is 'not to delay decisions'. Timely and correct decisions carry a firm out of troubles.

Production below capacity has led to a shortage of supply, whereas the demand for tractors, with the adoption of new HYVs-fertilizer-irrigation



technology has increased many fold. This situation has created black market condition for tractors. The big farmers have been able to pay the inflationary prices whereas the ordinary (medium) farmers are hard hit. Another recent factor which is responsible for creating bottlenecks in the adoption of machines is the petroleum price hike, necessitated by the embargo put by OPEC. All the developing nations have to impose heavy taxation to check the excessive unproductive use of petroleum and also to pay the raised price.

Farm income ( $Y$ ) is a function of the price of petroleum, diesel and other lubricants ( $P_f$ ), i.e.,  $Y=f(P_f)$ . With the prices of almost all the major crops fixed by the Central Government, which do not vary substantially over time, when  $P_f$  is changing continuously in the upward direction, *ceteris paribus*,  $Y$  cannot remain stable. With any increase in  $P_f$ , there should be a matching increase in  $Y$  and if  $Y$  is held constant, then the profit margin of the cultivators has to go down. This may compel them to curtail (or dispose off) the use of machinery. Even if the electric motors are used for lifting water, the situation appears to be the same, as electricity is also not available during crucial periods and to avoid a total crop failure the farmers have to opt for diesel engine. Thus a farmer is operating under a vicious circle of shortages of power. This situation calls for *de-mechanization* of farms and reverting to traditional technology. An alternative to this situation may be to explore more intensively the petroleum wealth of our country or find out other sources of energy.

The author has also made some calculations about tractor demand and feels that the long run policy for India should be to meet its own demand of tractors and we should not depend upon foreign help. A word of caution is also given by the author that policy-making in India on agricultural mechanization is very slow moving and weak to meet the challenge of agricultural development.

The price of the book appears to be on the higher side, when considering its 'literature value'.

PARKASH MEHTA

*Technological Change and Employment: A Study of Plantations*, I. Z. Bhatti, International Labour Organisation, Geneva; The Macmillan Company of India Ltd., New Delhi-28, 1978. Pp. xi+221. Rs. 75.00.

Very few books have been written on plantations especially on their economic aspects. Technological change and employment, a study prepared for the International Labour Office within the framework of the World Employment Programme is a welcome addition to the scarce source of material on plantations.

The study is undertaken to evaluate the impact of technological change on employment in the field operations of tea and coffee plantations in India. The increase in unemployment in recent years in the developing countries or

less developed countries has often been interpreted as a consequence of changes in technology which have favoured greater capital intensity in production techniques and have gone against the very objective of maximizing employment. Plantation employs a large labour force and the employment trend in this sector is studied here.

The present study covers only field operations of plantations (tea and coffee), and examines the technological changes and their impact on employment. The author has collected information regarding the technological changes in field operations regarding coffee and tea from Tea Board, Coffee Board and UPASI (United Planters Association of South India) and discussed the details about the selection of sample with these organizations. He has referred to the discussions and observations he had with these organizations at different places. The basic objective of the author is to empirically examine the change in technology in tea and coffee plantations in India on the basis of a cross-section analysis and to assess it in terms of efficiency criterion (*i.e.*, whether the change is from a less efficient to a more efficient technology) and then to examine the employment implication of the observed change. This has been done for coffee and tea separately.

The author correctly distinguishes between mechanical and biological technology. Both in the case of tea and coffee, biological technology is being applied and the change has been in biological processes. The application of biological technology has resulted in an improvement in plant production due to the intake of nutrients by plants. The principal intermediate inputs through which biological innovations are applied are improved seeds, fertilizers, drainage and irrigation and chemicals for plant protection.

The author has first summarised the major findings and also quoted the general conclusions of a survey of all plantations in South India (UPASI).

The author has analysed the change in technology by the coefficient, gross value of output/labour (O/L). The plantations selected for the study were divided into three categories on the basis of variations in O/L, with somewhat arbitrary inter-level partition. The three levels of technology were  $T_1$ ,  $T_2$ ,  $T_3$  in order of rising O/L. Four important factors, *viz.*, land, labour intermediate material inputs and fixed capital were taken for analysis of variance and regression analysis. An attempt was also made to estimate the indirect employment also generated due to change in technology. The study was based on a sample of 91 plantations—49 tea plantations and 42 coffee plantations. Out of 49 tea plantations, 28 plantations are located in North India.

Coffee plantations located in South India are comparatively smaller in size than the tea plantations. The author has discussed in detail the cultivation operations of coffee plantations in Chapter 2. As the processing of coffee seeds is also more or less a simple operation, this has also been discussed in brief. A brief reference is made to marketing and price of coffee. The analysis of data regarding 42 coffee plantations included in the study is for the period July 1972 to June 1973. The author has given a brief account of land, labour and capital factors and their impact on output.



Chapter 3 discusses the impact of change in technology and employment on coffee plantations. For the purpose of analysis, as noted earlier, the coefficient of gross value of output divided by man-days of labour input (O/L) is used as an indicator of technology. The three levels of technology are based on three ranges of O/L. Statement 3.2 presents the input utilization and the value of output at different levels of technology. Subsequently, the average input factors per Rs. 100 of output have been worked out and presented for different levels of technology. The analysis of variance and regression analysis are attempted based on the input data.

The author summarises the statistical inferences and points out that the shift in the production function associated with each level of change is characterized by reduced input of each factor for the same coffee output and factors significantly associated with the change in technology are intermediate material inputs, labour and managerial knowledge (MK). Further, it is observed that the relative proportion of expenditure on the components of intermediate material inputs, *viz.*, fertilizers, other chemicals, fuel and power and other intermediate inputs is approximately the same at  $T_1$  and  $T_3$  levels, it is radically different at  $T_2$  level. In the case of plant protection measures, the increase in the value of intermediate material inputs per hectare at  $T_2$  level is 49 per cent as compared to  $T_1$ , but it leads to a 90 per cent increase in the value of coffee output, the corresponding input and output increase between  $T_2$  and  $T_3$  levels is 12 per cent and 48 per cent. The author attributes this increase to more efficient MK. The cost of labour per unit of land increases with a change in the technology level, *i.e.*,  $T_1$ ,  $T_2$  and  $T_3$ , which is attributed to a rise in the unit cost of labour (wages).

As labour is not uniformly organized in all regions, the planters who have to pay higher wages tend to reduce labour inputs per hectare (L/D) and increase intermediate material inputs per hectare (I/D), thus substituting intermediate material inputs for labour. Such a conclusion seems to be confusing, and the author himself admits this on p. 70. The introduction of fertilizers or pest control measures would hardly cause the reduction of labour force.

The application of chemical weed control measures is highly correlated with levels of technology and this change from manual weed control measures has displaced labour with the advancement of technology. The author observes that the labour input increases with the increase in coffee output as more labour force is required for picking. Setting the decline against the increase, the net decline is reduced considerably.

The net effect of intermediate material inputs on employment being either negligible or positive, improvement in organization appears to be a major reason for the overall decline in labour input. More efficient use of labour force in each operation through rationalisation and better supervision and also with better reallocation of labour among different operations would very much depend upon MK.

The author correctly observes that at lower level of technology labour tends to be employed in excess of optimal requirements. Due to low level



of MK, the system of employing labour under task or contract systems is a clear indication of weak management at  $T_1$  level. The author concludes that the  $T_3$  level of technology represents a phase of consolidation in which factor proportions are brought closer to the optimum.

The author has discussed the workers' earnings and their capacity to work in coffee plantations. The capacity to work varies to a great extent due to the physique of the workers. The factors responsible for maintaining sound health are briefly described.

Based on average daily earnings of the workers, men and women and the total earnings of the workers in plantations of all size classes at three levels of technology  $T_1$ ,  $T_2$  and  $T_3$ , the average per capita monthly income of a family of workers is estimated at Rs. 41 at  $T_1$  level and Rs. 65 at  $T_3$  level. It is observed that workers in plantations at the  $T_3$  level of technology would be more capable of sustained hard work than workers at the  $T_1$  level.

From Statement 3.11, it is seen that the proportion of value added to gross value of output progressively rises as one moves from  $T_1$ ,  $T_2$  to  $T_3$  levels of technology. But it is of very little significance in the field of biological innovations which applies to coffee plantations as there is no evidence of capital intensification with an advance in technology and any assumption which attempts to link the share of physical capital with other inputs in non-wage share of value added is clearly untenable.

The effect of higher level of technology  $T_3$  compared with the  $T_1$  level is found to have resulted in a reduction of 31 man-days per hectare for the production of coffee and supplementary crops and 40 man-days per hectare for coffee alone.

Brief references are made to additional income-saving/investment-employment, additional income-consumption-employment due to a change in technology.

The fourth chapter of the book deals with tea plantations in India. It starts with location, area, production, size and age of plantations, organizational structure and employment in tea industry. On p. 94 the author has presented the production figures of tea in India. It is noted that 78 per cent of tea is produced in North India. But it is unfortunate that the author depended wholly on the R & D information from UPASI which is not applicable to North India. He could have obtained R & D results from Tocklai Experimental Station of Tea Research Association, which caters to R & D requirements of tea estates in North India. This would have helped him to assess the North Indian situation better. For instance, the author mentions on p. 95 that the productive life of tea bush is between 10 and 40 years, after which there is a decline in productivity. I am afraid that the author has ignored the effect of the type of plant, light leaf or dark leaf, its inherent characters that determine the productive life of the bush. Well planted dark leaf of 80 to 100 years old bushes are still yielding 20 to 25 quintals in North-East India while the badly planted bushes of light leaf type of ages between 20 to 40 years have declined in productivity.

Discussing the functions of Tea Board and the marketing system in tea, the author states on p. 103 that clones are developed and raised on experimental stations maintained by Tea Board and clones are not available from these stations in a large enough quantity. This statement is incorrect so far as development is concerned. Twenty-three clones and other biclonal and polyclonal stocks have been released by Tocklai Experimental Station, Tea Research Association (TRA). I don't agree with the author's contention that the clones are not available in adequate quantity. Tocklai has been providing enough quantity of nucleus cuttings of clones and stocks to the TRA member estates and the estates are having their own propagating plan. A survey conducted about two years back had shown that 85 per cent of the area covered under tea extension and replantation during the last twenty years is planted or replanted with clones in North-East India, of which about 75 per cent is under Tocklai released clones only. Even in the Darjeeling area, ten clones have been released by TRA; on the whole, there is very little shortage of planting material in North-East India.

While discussing the different operations in the field like pruning, irrigation, fertilizer applications and plant protection, the author mentions on p. 107 that North India uses lower dose of fertilizer than the South. The author quotes Venkata Ram that mostly 90 kg. nitrogen per hectare is used in the North as against the recommended dose of 90 kg. to 135 kg. nitrogen per hectare. This is a misleading statement. A survey in 1975 had shown that nitrogen application increased over time and it averages 117 kg. nitrogen per hectare (three-year average). Tocklai after long-term experiments, some of them are being carried on for 40 years, has proved that higher dose of fertilizer is detrimental to the productivity of tea in North-East India and it adversely affects productivity after two to three years of application. Consequently, Tocklai has recommended that no more than 135 kg. nitrogen be used. The tendency to use higher levels of nitrogen following recommendations elsewhere has been effectively curbed and the level of nitrogen cut-back in North-East India has averaged to about 130 kg. nitrogen per hectare. It is interesting to note that East African countries, Sri Lanka and South India have lowered their nitrogen levels also gradually. This clearly indicates that Tocklai's recommendation for fertilizer use was judicious.

The author mentions on p. 107 that split applications of fertilizer give better results. Tocklai recommends single dose at the beginning of the season March/April, depending upon the start of the rain and suggests that there is no advantage of splitting nitrogen application.

The author discusses in detail the plant protection measures—pests, diseases and weeds. He states on p. 111 that "North Indian plantations are relatively inefficient... the principle of blister blight protection has not been grasped in North-East India (Venkata Ram, 1973)." This statement is not correct; the plant protection measures are as efficient as in the South, if not more. As a matter of fact, it is a measure of the efficacy of pesticide use that only one-fourth as much pesticides is used per acre to achieve the same level of control as in the South with four times the quantity.



For studying the impact of technology and employment on tea plantation (Chapter 5), the author has selected a sample of 49 tea plantations—28 from North and 21 from South India. This sample size is too small for sound economic analysis. In the North-East India, *e.g.*, out of about 1,100 tea estates even less than 3 per cent sample has been used, which is too small and is bound to provide less reliable results.

The price of green leaf of 60 paise to Rs. 2.50 per kg. mentioned by the author may be correct for 1972-73 but is almost double in 1978-79.

The author discusses in detail land, labour and intermediate material inputs. He mentions on p. 117 about the training given to women workers. To the best of my knowledge, there is at present no training programme for women workers in tea plantations.

The author does not include fringe benefits which are paid with the wages in North-East India (though not in South India). Fringe benefits in 1978-79 formed 90 to 105 per cent of the wage cost depending upon the rate of bonus paid to the workers and form part of the wage agreement.

The author has estimated the cost of intermediate inputs; according to him, fertilizers and chemicals (pesticides, insecticides, fungicides and weedicides) accounted for about 90 per cent of the total expenditure on intermediate material inputs, which is very much on the higher side. This should not exceed 50 to 60 per cent of the total expenditure on material inputs in the garden.

The analysis for tea is based on the computation of coefficient  $O/L$  (gross value of output divided by man-days of labour input). The plantations are divided into three categories where the output per man-day is upto Rs. 7, between Rs. 7 and 14 and between 14 and 21. These ranges are also used to define the three levels of technology  $T_1$ ,  $T_2$  and  $T_3$ . It is observed on p. 122 that the  $T_1$  level includes only one medium size plantation of the North, which indicates that the observations regarding lower levels of technology are based on only a few plantation units of the North. There are comparatively lesser numbers of small tea plantation units in North India. This may also indicate that plantations in North-East India are comparatively at a higher level of technology.

The analysis shows that there is an increase in the use of intermediate inputs per unit of land with the improvement in technology which is very closely related to the sophisticated level of cultural practices associated with their use (MK). Intermediate material inputs substitute land, raise  $O/L$  by raising the productivity of land ( $O/D$ ) or tea plants growing on land. Of course, advancement in MK reduces  $L/O$  (labour per unit of output) as discussed earlier.

In order to assess the relative importance of different factors to change in technology, an analysis of variance is used. The scale of operation in A is taken for each input per unit of land. At different levels of technology, the variables taken under A are (a) man-days of labour per hectare ( $L/D$ ), (b) intermediate material inputs per hectare ( $I/D$ ) and (c) capital flow services per hectare ( $K/D$ )



In B the significance of the scale factor is tested. The variables taken are (a) size of plantation and (b) the number of tea bushes per hectare.

It is observed that man-days of labour input per unit of land do not change while I/D and K/D change significantly with the change in technology. In coffee it was found that man-days of labour per unit of land decline significantly with improvement in technology. Variations with size of plantations in technological changes is significant. It is quite correct to take into account only plantation units having processing facilities for K/D analysis.

The author follows the regression analysis for testing the significance of MK in tea. Intermediate material inputs per unit of land increase at low or high level of technology in all tea plantations except in the South where they decline between the  $T_2$  and  $T_3$  levels of technology. The author states on p. 131: "The decline in fertilizer input per hectare between the  $T_2$  and  $T_3$  levels of technology in the South could be due to an advance in cultural practices..." I don't agree with this argument. This is exactly opposite to what was said earlier; rather I believe that the plantation at the  $T_3$  level realises better cost-benefit ratio from fertilizer use due to high MK, *i.e.*, the rational use of fertilizers and reduce their dosage of nitrogen which at higher levels would have had deleterious effect in the long run. Even plantations at the  $T_2$  level of technology may follow this pattern in due course of time. UPASI, Sri Lanka and East African research institutes with the sole exception of Tocklai have advocated the use of higher dose of fertilizers and has, by inference, been working for plantations with higher level of technology utilization. As mentioned earlier, they started recommending reduction of nitrogen fertilizer doses during the last few years. The author further refers to the increase of labour input with fertilizer application from 12.7 man-days in  $T_2$  to 20.5 man-days in  $T_3$  per hectare per year. This is somewhat strange unless the number of split doses are increased.

I agree with the author that the labour cost per hectare goes down with an advance in technology both in the North and the South but I don't agree with the author that the labour cost per hectare in the South is much higher than in the North. If all the fixed and variable fringe benefits which are paid to the workers are included, the total wages paid to the workers are slightly higher than the South. As per Tea Statistics 1976-77, the output of made tea per man-day in the North is lower than in the South—2.35 kg. per man-day in the North against 2.55 kg. per man-day in the South. This is rather paradoxical as perennial plucking (throughout the season) in the South also reduces the employment of seasonal workers who are required in the North due to seasonal plucking which lasts only for about nine months in a year. It should reduce the labour requirement in the South rather than in the North.

Another conclusion of the study is that the labour cost per hectare increased by 70.4 per cent and 6.7 per cent under  $T_2$  and  $T_3$  over  $T_1$  respectively with a corresponding increase in labour input of 5.7 per cent and 5.9 per cent. The increase in the labour cost per hectare in the North is estimated at 18.8 per cent between  $T_1$  and  $T_2$  and 9 per cent between  $T_2$  and  $T_3$  levels of technology. It is observed that the labour input per hectare increases by 21.9

per cent between  $T_1$  and  $T_2$  but declines by 19.8 per cent between  $T_2$  and  $T_3$ . The decline in labour input per hectare with improved technology is confusing. There can be marginal difference in the wage structure between  $T_2$  and  $T_3$ , *i.e.*, at the  $T_3$  level of technology, the fringe benefits may be slightly higher but if the labour cost per hectare is higher, the labour input per hectare should not decline unless the average productivity per hectare of  $T_3$  level of technology plantations is much higher than that of  $T_2$ . In that case the per hectare utilization of labour under plucking will be higher due to higher productivity. Of course, the author has further investigated the factors for this change in labour input per hectare of land.

The author further discusses the direct displacement of labour. He correctly points out the reason to be the introduction of chemical weed control both in the North and South. This has resulted in some decline in labour utilization for controlling weeds. One would agree that chemical weed control is still not adopted by all the plantations in the whole area; even now a substantial portion is being left to be covered under manual weed control. The significant benefit of chemical weed control in subsequent years and the corresponding reduction in costs, along with the indirect benefits like improvement in plucking efficiency and better absorption of nutrients in the soil have attracted wider application of this method.

The author finds a negative impact of intermediate material inputs on labour input. He further states that between the  $T_1$  and  $T_2$  levels of technology, the labour input in plucking rises both in the North and the South. Even at the  $T_3$  level of technology, the fall in labour input in plucking may be due to rationalisation of labour which may be adopted to offset the shortage of labour which has been experienced by a large number of plantations during the busy season in the North.

The author has given a good account of the impact of organizational improvements on utilization of labour. He discusses on p. 143 the different levels of input of fertilizers per man-day and mentions the system of split application which is not applicable to the North. Split doses of fertilizers are not applied in the North.

From Statement 5.10 on p. 144, one can see that the selection of sample plantations could have been better had the author thought of selecting from the North large plantation units under  $T_3$  level of technology on an average yielding 1,800 kg. to 2,500 kg. per hectare in 1972-73. The selection of not only a very small sample but also not a representative one has resulted in drawing inferences about the plantations in the North, which do not appear to be valid.

The author refers on p. 145 to the workers' earnings and capacity to work. He finds that the average per capita monthly income of permanent workers in the North varies between Rs. 44 and Rs. 60 including subsidy on cereals and between Rs. 40 and Rs. 75 in the South. It may be a correct estimate for the South but the total average monthly family earnings in the North would certainly be higher than what is estimated.



The author has brought out well the share of value added to the gross value of output. He finds that it is higher in tea than in coffee. Of course, it declines with an advance in technology at each successive level in tea plantations both in the North and the South. I feel that the share is much higher as the per hectare manpower utilization is almost double in tea than in coffee.

The author briefly deals with the direct and indirect employment effect of the change in technology from  $T_1$  to  $T_3$  levels in tea. He admits that an estimation of the indirect employment effect of the observed change in technology in tea plantation is not feasible. However, direct employment increases from  $T_1$  level to  $T_3$  level by 30.7 man-days.

The additional income, consumption and employment created at the  $T_2$  level of technology over  $T_1$  are also presented. These are rather approximate estimations.

The fifth chapter includes a discussion on the manufacture and distribution of additional non-labour inputs in tea plantations. The figures in the table given on p. 152 seem to be confusing as the average for all-India is much higher than the average for the North and the South in the case of additional expenditure per hectare and additional employment in man-days.

It is found that the net effect on employment of a change in technology in tea plantations in India, measured at any point of time, is positive as technology improves from  $T_1$  level to  $T_3$  level. As the change in technology in tea plantations is accompanied with a rise in plantation wages, its effect on employment is not only positive but it also adds to the welfare of the workers.

The study on the whole is a welcome addition to the literature on the subject but suffers seriously from inferences drawn about North Indian tea which accounts for about 80 per cent of the country's total production. We hope that these defects will be rectified in the next edition of the book or by issuing a suitable addendum.

R. C. AWASTHI

*Rural Money Markets in India*, Subrata Ghatak, The Macmillan Company of India Ltd., New Delhi-2, 1976. Pp. vii+230. Rs. 58.00.

The book presents the findings of an analytical study of the various aspects of the working of the rural money market in India, which is characterized by a duality with its organized and unorganized sectors having different business practices and rates of interest. The feature which distinguishes this study from some of the recent additions to the books on Indian rural credit system is the use of statistical tools to analyse the available data on the problems like the factors affecting the demand side of agricultural credit, etc.

In Chapter 2, the nature and composition of the dual rural money markets are described in detail, bringing out the difference in their activities and a low degree of contact between them. Spotlighting the continued pre-dominance of the private agencies nearly twenty years after the beginning



of the Plan era, the author prepares the background for the analysis of the working of the organized agencies in the chapters to follow.

In Chapter 3 the author examines the demand side of agricultural credit and has attempted to test some hypotheses about the factors affecting it. Some estimates of the relative changes in the significance of some of the explanatory variables are examined statistically. The important conclusion drawn is that it is capital rather than family expenditure which is the more significant explanatory variable affecting the demand side during the reference period. The author has used data from the two Reserve Bank Surveys, namely, Rural Credit Survey, 1951-52 and All-India Rural Debt and Investment Survey, 1961-62 for this regression exercise. A perusal of this chapter shows that in the discussion relating to the year 1951-52 the data for 55 districts are used in the regression exercise on borrowings. But some of these districts were not covered in the exercise on indebtedness nor any explanation given for the exclusion of those districts. While analysing the figures of indebtedness, loans outstanding for one year or less have been considered. Obviously, these data reflect only partial indebtedness of households. (Incidentally, the researcher should have found out the reason for segregating these loans in an agricultural economy in which there are two crop cultivation seasons, *i.e.*, *kharif* and *rabi* and data were as at the end of the reference period). In the 1961-62 data exercise, the aggregates for borrowings and indebtedness have been used and not the per family figures (used in the 1951-52 data.) The use of such aggregates could affect the results in certain situations. Also the comparability between the two points of time is lost to an extent. Apart from this, the data on indebtedness covered all cash loans outstanding as on June 1962 (and not only those loans which were outstanding for less than one year). It may be pointed out that per family and per reporting family figures are readily available in the same publications in which the figures on aggregates are given.

The data on dependent variables and the explanatory variables used in the regression analysis are available as identities. It is, therefore, not correct to term the individual components of the identities as 'factors'. In regression studies of this type carried out by other researchers, borrowings/indebtedness was expressed in the regression model as a linear function of total capital expenditure, family expenditure, etc., (and not as a function of borrowings for capital expenditure, borrowings for family expenditure, etc., used in this book). The entire regression analysis could, therefore, be valid under the assumption that the components of borrowings/indebtedness are proxy-variables for their respective aggregates.

It may be pointed out that the most significant variable coming out in a regression analysis does not always mean that it is the most significantly contributing variable to the value of the dependent variable. The conclusion that comes out of any regression analysis is that such significant variables have large predictive value as far as the dependent variable is concerned. Even a cursory glance at the data on borrowings and indebtedness would show that the borrowings for family expenditure is the single largest com-

ponent of the total borrowings. In fact, such a cross-check on data would have served as a cautionary signal to the author in his concluding that the results of the regression analysis refuted the widely held hypothesis. It is quite probable that the high significance of capital expenditure in farm business in the regression exercise on borrowings/indebtedness is due to relatively less number of households reporting borrowings for this purpose and the consequent less variability between these data.

In Chapter 4 an attempt has been made to develop a simple model to explain the causes of high interest rates in the Indian rural economy. In this context the reader comes across a statement on p. 83: "It follows that with a 70 per cent chance of recovery, the moneylender may be justified to charge 50 per cent interest rate. If the moneylender's administrative cost is added to this, the rate could be higher than 50 per cent and even such rates may not contain elements of monopoly profit" (Bank rate assumed at 5 per cent). For want of space, it is not proposed to critically examine this 'simple theory' propounded or its serious policy implications.

In Chapter 5 the working of the co-operative credit system is discussed and its weakness pointed out. In Chapter 6 the major problem of promoting integration between the two markets is discussed and an attempt has been made to quantify the links between the two sectors. The author advocates linking of commercial banks with primary agricultural credit societies and development of agricultural bill market for investment of funds thus released into non-credit societies. His other suggestions are standardisation of indigenous bills of exchange and raising of deposit rates to attract more savings. He suggests that the indigenous bankers be integrated with the organized markets. Though he has pointed out that these bankers have shown reluctance to abide by the minimum conditions laid down by the Reserve Bank, he suggests that this discipline be relaxed initially for some years. Knowing well the types of non-banking business in which they are engaged and the size of financial bills traded by them, on the one hand, and the expansion of commercial and co-operative banks branch network over large areas in the country and purposeful efforts made by them to reach the small business, industry and agriculturists, on the other, the recommendation does not appear desirable to the reviewer.

The printing and get-up are good but the price appears to be rather on the high side for the Indian readers.

V. M. JAKHADE

*Impact of Harvest Combines on Labour Use, Crop Pattern and Productivity—Interim Report on Rabi Survey (1977-78)*, D. P. Gupta, P. Rangaswamy and R.P.S. Malik, Research Study No. 78/8, Agricultural Economics Research Centre, University of Delhi, Delhi-7, 1978. Pp. 68.

The debate on the impact of mechanization in agriculture has continued unabated since the early fifties. The last decade has added more to this



controversy and issues have become further complicated by the interacting and confounding effects of biological and mechanical innovations. It is, therefore, not surprising that apart from massive amount of research work by individuals, there have been frequent requests from policy formulating bodies to undertake further specific studies in this area. The report under review is based on such a diagnostic study conducted at the instance of the Planning Commission, Government of India, with the main objective of estimating the extent of saving in time and labour through harvest combine technology as compared to intermediate technology (where harvesting is done manually and threshing is done with a mechanical thresher) and its effects on crop pattern, crop productivity and labour use.

This interim report is based on a sample of 176 households—89 users and 87 non-users of harvest combines—in the district of Ludhiana, Karnal and Ganganagar and relates to the *rabi* season of 1977-78 and *kharif* season of 1978. The scope of the study is further restricted because of choice of farmers who are not consistent in the use or non-use of harvest combines for wheat and paddy crops over a reasonable period of time. This is a serious limitation as the study specifically desired a clear-cut distinction of users and non-users over time. Secondly, the comparison between users and non-users can be meaningful only if they come from the same farm size and asset structure groups. This, though originally contemplated, has not been rigidly followed while selecting the sample. The study has also ignored the differences between users and non-users with respect to use of tractors, tubewells, etc.

At the outset, the authors present the crop pattern adopted by the users and non-users during *rabi* and *kharif* seasons and the productivity of crop in the *rabi* season. They try to emphasize on a 2.81 per cent higher cropping intensity for users as compared to non-users but no attempt is made to test this difference statistically. This is a serious lapse particularly in view of the marginal magnitude of this difference on the average. The conclusion, apparently without any statistical test, indicating non-significant cropping pattern differences between these two categories of farmers has to be carefully weighed in the context of uncertainty about the availability of harvest combines. In the farmer's report the authors do find support to crop pattern changes. The overall conclusion on higher yields per acre for users is not convincing. The table on p. 22 does not demonstrate a uniform pattern in yield figures on different farm size-groups and also no attempt is made to explain such patterns in the text. However, the authors promise to analyse and present the causes of productivity differences in a final report. In the concluding para of Chapter 3, the integrity of yield data is questioned by the authors themselves giving readers no alternative but to take the results lightly.

In addition, there is a possibility of some economies of such mechanization in time required for harvesting and threshing which in turn determines the sowing time of the next crop. Firstly, the question is relevant in this study as there is a very little time gap available between the harvesting of *kharif* paddy and sowing of the following wheat crop with the result that a little delay in

the harvesting of paddy has repercussions on the sowing of wheat. Secondly, it is also important as the frequent occurrence of thunderstorms in April-May which often results in fairly widespread loss of wheat crop at the time of its harvest. The problem is investigated in two parts, *viz.*, (i) impact of paddy harvest on wheat sowing, and (ii) impact of wheat harvest on sowing of succeeding crops. The observations in the first part are made on user and non-user fields in respect of completion of paddy harvesting, start of ploughing operations and initiation of sowing operations for wheat. The observations in the second part are made only in respect of completion of wheat harvesting and initiation of ploughing operations. In spite of the fact that many other factors are responsible for variations in the commencement and completion of these operations and the effects are likely to be confounded, the data show significant differences in the dates of completion of wheat harvest and initiation of ploughing between user and non-user fields. However, on aggregate it is concluded that the use of harvest combine has not resulted in any advancement of sowing dates.

The comparatively early completion of ploughing operation on user farms is not solely because of harvest combine, but as indicated by the authors, it must also be attributed to the use of tractors and improved asset structures on such farms. Besides, many other factors need to be considered and their effect isolated before one visualizes the harvest combine's contribution. The whole result once again has to be viewed in the situation of inadequacy of harvest combine time mainly due to excess demand over supply. Apparently, the conclusion does not show much potential of such technology in respect of its contribution to advancement of date of sowing and in turn its effects on the yield of the subsequent crop.

The productivity differentials mainly arise from (i) delays in harvesting operation resulting in grain shedding and weight loss, and (ii) the variation in levels of other inputs and management decisions, etc., on different farms. Hence, the yield comparisons on user and non-user farms do not exclusively reflect the effect of use of harvest combine. Yield differentials on the same farms under two technologies, *viz.*, harvest combine and intermediate technology may, however, be more appropriate in this context. The results on this seem to be very weak and in case of at least one district (Karnal) the grain yield is more in the case of intermediate technology. One wonders, under the above explained difficulties, how the authors boldly attempt to state the existence of significantly higher yields of wheat grain under harvest combine than under intermediate technology.

The comparison of total value product between these two technologies on the same farms clearly shows that the total value is more in the case of intermediate technology use. However, no statement regarding this appears in the concluding para of this section. This would have been more relevant as the farmers will ultimately be concerned with the total value of output and minimum loss of straw in harvesting process. The loss estimates presented in Table 5 on the basis of farmer's report are very crude.



The estimate of human labour displacement due to the use of harvest combine in relation to the use of intermediate technology for *rabi* wheat crop is at the rate of 9.13 man-days per acre, the rate is higher on the small farms. In general, the casual labour is affected most at the rate of 5.85 labour days per acre; the local labour is displaced by 3.07 days and migratory labour by 2.76 days per acre which is almost eliminated under harvest combine use. The efforts of the authors in providing such estimates which have immediate policy implications need to be appreciated.

While presenting cost calculations on such technologies they come out with a figure of Rs. 39/acre by which the harvest combine is cheaper than intermediate technology on user farms while it is cheaper only by Rs. 22/acre when harvest combine on user farms is compared with intermediate technology on non-user farms.

Throughout the report one remains convinced of its limited use in the absence of any comprehensive look at various related aspects of such technology. The diagnostic study like this, because of its poor sampling design, neither serves the purpose for which it is conducted nor adds much to the literature on impact of agricultural mechanization.

R. D. GHODAKE

*A Comparative Study of Cotton Marketing Systems in India*, IMC Economic Research & Training Foundation, Sir Purushotamdas Thakurdas Research Wing, Indian Merchants Chamber, Bombay-20, 1978. Pp. viii+198. Rs. 30.00.

Marketing of cotton, which is a major cash crop grown over different States in India and which involves a number of stages from assembling to the final delivery of lint in pressed bales to textile mills, has been traditionally dominated by private agencies. With a view to helping the cotton growers to receive a larger share of the consumer's rupee, the formation of co-operative marketing societies was encouraged. In order to ensure stable prices to cotton growers so as to provide them an incentive to expand their cotton production, the Government of India constituted the Cotton Corporation of India (CCI). Recently, the Maharashtra State Government has taken a radical step by the socialisation of cotton marketing in the State by enforcing the cotton monopoly procurement scheme, which has given a severe jolt to the private cotton trade. Due to the emergence of these factors, it was very necessary to study the cotton marketing systems in a comparative way.

The impact of different marketing systems on the cotton economy is dealt with in this book. IMC Economic Research and Training Foundation undertook this project with the prime objective of making a comparative study of the prevailing cotton marketing systems in the four important cotton growing States, namely, Gujarat, Maharashtra, Karnataka and Andhra Pradesh. It has been pointed out that this study which was undertaken under the able guidance of V. M. Jakhade, suffered from manpower and

financial constraints. As a sequel to these constraints, it largely depended on the secondary published data instead of primary data by way of field investigations. However, four field studies were made in two districts of Maharashtra and one each in Karnataka and Andhra Pradesh which have been presented as case studies. No doubt, the whole study sheds light on the important issues concerning the cotton economy like expansion of cotton production, employment at the production and marketing stages, development of agro-processing industries and availability of raw material for production of cotton textiles which is one of the basic necessities next to food articles.

The report begins with a brief presentation of the macro level salient features like the growth of production, area, yield, government policies under the various Plan periods as well as the marketing sides of cotton economy at the all-India level during the last decade. The depiction of macro level picture serves as a background to discussions at the individual State's level which follow in the subsequent chapters.

Chapter 3 deals with the cotton economy in Maharashtra State. Maharashtra producing nearly 30 per cent of the total output of cotton and having about the same percentage of area under cotton, becomes an important and very vital part of the all-India cotton economy. Hence, policy measures regarding cotton in this State can have both short- and long-term effects on the cotton economy of the country as a whole.

The hypothesis whether or not the change in the cotton marketing system (from private trading to State monopoly trading) can favourably affect the area under cotton and its output in Maharashtra State tested with the help of regression models for both acreage and output, is discussed in Chapter 4. This regression analysis suffers from inadequate data due to lack of continuity of the State monopoly procurement scheme for a sufficient number of years. The conclusions drawn have been subject to this limitation.

The controversial Maharashtra State cotton monopoly procurement scheme is X-rayed in detail in Chapter 5. The pros and cons of different aspects like guaranteed prices, recovery of co-operative dues, cost of marketing cotton, inter-State smuggling of cotton under the monopoly procurement scheme are thoroughly discussed in this chapter. The experience of the scheme shows that much larger responsibility was undertaken with limited financial, technical and administrative manpower resources and without adequate time for preparation of groundwork.

Chapter 6 deals with the findings of field investigations which were carried out in Jalgaon district. It was felt that Jalgaon district being one of the major cotton growing districts, the impact of monopoly procurement scheme could be well reflected in that district. The geographical location of Jalgaon district also made it possible to study the alleged illegal inter-State movement of cotton. The sample study of 100 cotton growers suggests that a majority of cotton growers were dissatisfied about fixation of guaranteed price which was at par with the price recommended by the Agricultural



Prices Commission and had not taken into account the demand and supply conditions at that time. Farmers also indicated that grading was not done properly and corruption was rampant at all levels.

Various aspects of the cotton economy in Gujarat are discussed in Chapter 7. Gujarat has been the pioneer in the co-operative marketing of cotton in the country. The first co-operative sales society to market cotton was organized as early as in 1920. Cotton marketing in Gujarat is a bi-sectoral model of freely competing (i) private traders and (ii) co-operative cotton marketing societies. The organizational structure of co-operative marketing, spinning and weaving societies is outlined in this chapter. It also includes an interesting case study of three co-operative societies in South Gujarat. The experience of co-operatives in Gujarat reveals that if persistent efforts are made under the able leadership and with willing participation of growers, such agencies can develop into financially sound and viable institutions, and backed up with professional management can be strong enough to compete effectively with the private traders.

To know the full impact of different cotton marketing systems, it was recognized that the views of textile mills, the final link in the chain of cotton marketing, should also be included. Specially designed questionnaires sent to 52 textile mills in Maharashtra and 54 in Gujarat throw light on the efficacy of monopoly procurement scheme especially the timelines, and adequacy of supplies of lint of required varieties. This discussion is encompassed in Chapter 8.

Chapter 9 covers a case study of Bijapur district in Karnataka where the private trade is still predominant. Co-operative cotton marketing has also been initiated there but it has yet to gain significance.

The last chapter contains the summary and conclusions of the study. The author rightly concludes that limited government resources can be used in a planned manner to foster the growth of co-operatives in a phased fashion. So in the long run they can become effective competitors to the private trade. The inclusion of discussion on the domestic operations of the CCI would have made this study complete, which being a large buyer of cotton offers a good competition to the private trade.

The Government of Maharashtra has re-introduced the monopoly procurement of cotton from December 1978 on a compulsory basis. The scheme was revised and the earlier errors were corrected and as a result, it is reported that it has been quite successful and unlike the previous years, the farmers have been also satisfied with it. Encouraged by the success of Maharashtra, some of the other major cotton growing States have been considering seriously to introduce similar schemes in their own States. If all the major cotton growing States were to follow the monopoly procurement scheme of Maharashtra, the all-India cotton economy will face the danger of fragmentation. If the cotton economy should get divided, then, each State will try to maximize gains for its cotton growers and as a result, cotton prices may become abnormally high and distorted and in turn the consumers of cotton cloth may end up paying a high price for clothing which is not

desirable in a country where a large mass of people are below the poverty line for obvious reasons.

This book should prove quite useful to students of economics, researchers and even to policy-makers.

RANJANA PENDHARKAR

*Agricultural Finance in Nepal: An Analytical Study*, Kumar Kant Jha, Heritage Publishers, New Delhi-1, 1978. Pp. xvi+241. Rs. 50.00.

The subject of agricultural finance in Nepal as well as a detailed analytical study conducted by Jha has significance since 92 per cent of the population in Nepal depends partly or entirely on agriculture for its livelihood, where the average size of holding is 2.83 acres. This study as a piece of research work based on scientific field investigations confined to six villages in Eastern Terai should provide sufficient evidence to the policy-makers and enable them to use the data as tools for modifying the policy decisions.

This book would be an addition to the historical documents on agricultural finance in Nepal and is an interesting academic exercise. The survey data which relate to only one year—May 1969—may not provide the factual picture of the situation in respect of agricultural credit as it is influenced by many seasonal variations and other factors. Also, the data have not been subjected to statistical analysis and tested at specific level of significance, which therefore do not eliminate the chance errors. Thus, the scope for establishing the degree of variation between various groups of farmers as also the relationship between farmers and various parameters under study is very much restricted. However, it has provided an insight into the subject as it obtained in the year 1969 and it would be worthwhile if a similar study is conducted now to find out the structural and functional changes in agricultural finance in Nepal.

The findings of the present study revealed that the proportion of borrowing families was slightly higher among the big and large cultivators as against the medium and small cultivators. The average borrowing per family decreased with the decline in the size of cultivated holdings. Similarly, the average size of borrowing per borrowing family showed a downward trend. Hence, there was a close relationship between the economic status of a farmer and his borrowings. The proportion of families reporting borrowing for current and capital expenditure on the farm was less. The proportion of those borrowing for family expenditure was more in every group of cultivators. Big and large cultivators borrow more for capital and current expenditure on the farm as well as to pay land tax. A large proportion of families from among the medium and small cultivators borrowed for family expenditure. Borrowings for repayment of debt were insignificant among the large cultivators, while other classes of cultivators had not reported borrowing for this purpose at all.



The findings further revealed that there was an inverse relationship between the rate of interest and the size of cultivated holdings. As the size of cultivated holdings decreased, the rate of interest increased. The rate of interest was very high for the small cultivators, high for the medium and relatively low for the large and big cultivators. A very large part of borrowings of every class of cultivators had been contracted at rates ranging from 21 to 30 per cent. At rates exceeding 25 per cent not a single cultivator belonging to the big class had borrowed. At rates varying between 31 and 40 per cent, the proportion of borrowings to the total decreased from the large to the small cultivators. As soon as the rate of interest exceeded 40 per cent the large cultivators disappeared from the scene of borrowings. The proportion of repayments to borrowings was higher among the big and large cultivators than among the medium and small cultivators. This meant that the big and large cultivators had greater capacity to repay and hence a large proportion of their borrowings was repaid in less than one year's time.

The study revealed that 60 per cent of the farmers borrowed during the year under reference. A major portion of their borrowings was for family expenditure and a sizable portion was used to pay land tax. The amount spent on the improvement of the productive resources and for creating tangible assets was insignificant. As a large part of the debt has been incurred for unproductive purposes and by paying high rate of interest on borrowings, the returns from the farms were static and the repaying capacity of the farmers was practically nil. The high level of family expenditure—litigation, journeys and social ceremonies—constituted a drain upon their limited income which could otherwise be used productively. The author has aptly highlighted the need for educating the farmers, providing the credit in kind and effective supervision of the end-use of credit. The denial of credit for non-productive purposes might drive the farmers to moneylenders with all its adverse consequences. There is, therefore, need for meeting all the legitimate credit needs of farmers subject to their repaying capacity. This study has, therefore, drawn pointed attention of the financing institutions for strengthening their offices with necessary field staff, training them in the scientific loan appraisal/processing techniques, pre- and post-sanction/disbursement scrutiny, simultaneous evaluation studies on the lending procedures, etc.

While the commercial banks lent only against the security of gold and silver, the co-operatives granted loans including the crop loan (short-term) mainly against the security of land. The mortgage of land usually involved a time consuming procedure and delayed the availment of loans. It also placed a serious limitation on the provision of credit to tenants/share-croppers who constituted the bulk of the agriculturists. Further, this mode of security (mortgage) for short-term loans handicapped the borrower in raising the medium and long-term loans for which mortgage of land as security was generally essential. It may be further observed that this also did not always adequately protect the interest of the lender as the sale of mortgaged land had often proved to be difficult. The subject of lending against mortgage of land as security is highly controversial and much debatable. Even in India, the

emphasis of lending has been on production-oriented activities rather than security-oriented. While this has been the correct approach it may not be forgotten that creation of mortgage as security in favour of banks prohibits the farmers to offer land to moneylenders for securing consumption or additional loans which ultimately jeopardises the repaying capacity of the farmer, which the financing institution has earlier assessed. It is in this connection there has been a need for 'one borrower one financing institution' relationship. This also requires close supervision of the farmers which adds to the operational cost of the financing institution. In any case, the help from the revenue authorities in respect of creation of charge as also mortgages is of a very crucial nature.

The author has observed that the main purpose of organizing co-operatives had been to supply credit to agriculturists so as to provide an effective alternative to private credit agencies. The study, however, showed that the co-operatives played comparatively a minor role as the share of co-operative finance in the total credit requirements was 5.43 per cent only. Thus, it had not become an effective alternative to moneylenders. The co-operatives had been inadequate in three respects, *viz.*, (i) it had not covered a large part of the country. The percentage of the villages covered was 3.84 at the end of the Third Plan. (ii) There were large sections of the population which remained outside its membership. The percentage of the population covered was just 2.70 at the end of the Third Plan. (iii) Even where co-operatives existed, a large bulk of credit requirements of the cultivators was met by sources other than co-operatives. The reasons attributed by the author for these inadequacies were institutional bottlenecks and the low demand for production credit. This points to the fact that the co-operative credit institutions should be adequately strengthened in respect of their organization and financial resources. In India some steps have been taken in this direction by (i) re-organizing the co-operative credit societies in respect of making them viable, providing full time paid secretary, (ii) ceding the primary agricultural credit societies to the commercial banks, (iii) sponsoring the Regional Rural Banks in grey areas. These also require the support of the Government and effective co-ordination between various agencies. Also the demand for credit could only be created if proper environment for favourable growth of agriculture through agricultural research, extension and education is created.

The case study of three multi-purpose societies showed that they were multi-purpose only in name and no attempt was made to systematise their non-credit functions. In fact, the multi-purpose activities expected of them were beyond their financial, intellectual and administrative resources. With a view to building up viable units of co-operative societies, the policy had been to organize large-sized societies. Accordingly, 101 such societies were brought into existence in 1970-71. But the average performance of even those societies remained poor. Functional deficiencies were caused by the fact that only progressive members were eligible to borrow from them. Traditional farmers, who constituted the bulk of agriculturists, were not eligible for loans from the societies. Further only those cultivating economical size of holding were



allowed to borrow from the society. In the absence of a proper definition of economical size of cultivated holdings, the possibility of securing loans from the society depended entirely on the discretion of the officials concerned. While there is urgent need for disbursing the loan facilities to any farmer, tenant, share-cropper, etc., on the basis of his repaying capacity, the farmers should get all their requirements, viz., seeds, fertilizers, pesticides, services, guidance, marketing facilities through the contact point. The Farmers' Service Societies sponsored by the District Central Co-operative Banks as also commercial banks as in India can be set up with local modifications.

In order to expand institutional agricultural credit on a considerable scale, the Government introduced a Compulsory Savings Scheme. However, factors associated with low income, improvidence, social customs which require considerable outlays, traditional system of land tenure, high cost of credit and supplies, low prices of produce, etc., which already transferred a sizable part of farm income contributed to the failure of the Scheme. Of course, the funds may not be a problem for the development of agriculture, if an institution like Agricultural Refinance and Development Corporation is created to provide refinance for all eligible development projects. This as well as an institution like Agricultural Finance Corporation can provide consultancy work in formulating development projects which can be financed by the World Bank, International Development Association as also from the funds of International Fund for Agricultural Development.

A. R. PATEL

*Micro-Macro Links in Planning: The Role of Small Group Action in Indian Agricultural Development and Its Implications for Extension*, P. B. Krishnaswamy, Development Studies Centre Monograph No. 9, Australian National University, Canberra, Australia, 1977. Pp. ix+116. A\$ 6.00.

The study is the result of the author's one year (1974-75) Visiting Fellowship at the Australian National University in the Research School of Pacific Studies. Coming from a civil servant associated for long with food production and rural development in India, the analysis offers a lot of practical guidance in agricultural affairs. Of late, agricultural production, in particular foodgrains production in India has increased appreciably following the introduction of the improved methods of agricultural production, the benefits of which, however, have not accrued to all farmers equally. This, of course, is one of the main causes of the persistent rural poverty. How to make the new technology spread among the small farmers is the main concern of the study. "The study focusses attention on one aspect of the challenge of rural poverty, namely, making the improved techniques of production more broad-based among cultivators" (p. 1). Towards this end, the author suggests that besides augmenting the supplies of scarce agricultural inputs including soil and water, the farmers ought to be organized into small voluntary action groups to carry out the various tasks of agricultural development under the

expertise to be provided by the state. In other words, certain tasks the farmers can individually carry out but certain others they need to carry out in groups. "Certain elements in good soil and water management are within the scope of individual farmer action. Certain others, however, require a unit of action that is beyond the typical farm in Asia. The individual farmer who tries to protect his farm from soil erosion, to improve drainage, or even to provide himself with a tubewell is not likely to go far. He will either have to look to the government to provide such facilities, or to join with his neighbours before he can accomplish any of these tasks" (p. 2). These are the micro-macro links in planning in question.

Three chapters (2-4) out of the nine chapters of the monograph cover the familiar ground of the objectives, the effort and the achievement of the last quarter century of agricultural planning in the country. The well-known objective of agricultural planning throughout has been, with only minor variations in emphasis, agricultural self-sufficiency, commencing with foodgrains, through maximum yields of crops per unit of agricultural land to be brought about by an increasing use of internally produced modern agricultural inputs. Further, no class of the cultivating population is to be left behind the increase. Finding the small and marginal farmers very much lagging behind in the process, they were selected for special assistance and help during the Fifth Plan.

The study discusses (pp. 7-32) the effort at achieving the above objective, consisting of what it terms as strategies, instruments and techniques. The strategy of agricultural development till 1966, according to the author, consisted of increasing the net cultivated area, enhancing the percentage of irrigated area to the total cultivated area and increasing the percentage of purchased inputs and consequently these increased by 18 per cent, 5.8 per cent and 39 per cent respectively between 1951 and 1971. Yet, owing to the neglect of agricultural education and research with irrigation and agricultural infrastructure accounting for almost all of the agricultural investments, yields languished, in spite of the stress on increasing them, even in the IADP areas. Following this, the New Agricultural Strategy was introduced in the mid-sixties. However, its results though laudable initially have petered out of late and what is more important, the small and marginal farmers are left out of the process to a great extent. The 'instruments', meaning 'both organizations and personnel employed in the process of agricultural modernization', reviewed are the Indian Council of Agricultural Research, Agricultural Universities, co-operative societies, *Panchayati Raj*, Community Development (CD) and National Extension Service (NES), 'the most important single agency newly created for purposes of agricultural development since the attainment of Independence', but found unsatisfactory. The techniques of agricultural planning consisting of prescribing some rigid targets and attaining them somehow are found to be highly defective by the author. For, "When planning gets equated with achievements of targets, means become the ends and form takes precedence over substance" (p. 24).

In spite of a 100 per cent rise in output and some 50 to 60 per cent increase in yields, the author notes the state of agriculture in the country to be one of



dissatisfaction (p. 33). This is, in his view, owing to particularly two factors, namely, the deceleration of the new technology of late and its denial of benefits to the small and marginal farmers. So, he proceeds to outline the measures required to permeate the new agricultural technology among the smaller sections of the farming population. The rest of the study is devoted to a discussion of these measures.

But, why group action? It has been found that the farmers seldom use the full dosage of fertilizers prescribed or the complete set of the package of practices recommended. They find the inputs are either in short supply or beyond their reach from the price aspect, resulting in lowering of the yields well below the research farms' level. Small sized farms are said to necessarily call for group action for an ever increasing agricultural production. "And other things being equal, the smaller the operative farm unit, the greater will be the need for group action" (p. 49). Then the study bares the well-known fact of the 'smallness of the Indian farm averaging some 2.60 hectares and fragmented into some five pieces of 0.5 hectare each (pp. 51-52) to statistically reinforce the need for group action in Indian agriculture. Besides, it is beset with credit, supply, storage and marketing problems too which also heighten the importance of group action in the setting.

Chapter 7 is the most important part of the study. It contains four detailed blueprints of group action on seed supply, plant protection, water supply and soil and water management. The farm groups, according to the scheme, will be rendered expert guidance by the agricultural extension agencies. In addition, "a para-technical aide who has access to several experts located at higher levels" is to be appointed at the village level. "There is in this sense a clear need for a 'barefoot-doctor technology' in agricultural planning and implementation in a vast country" (p. 66). The impact of good seed supply, extensive plant protection, augmenting irrigation and scientific soil and water management would be to make the agriculture highly amenable to the new technology. In each one of the four cases, a detailed action plan is suggested. And the author sees no alternative to group action for greatly improving the agricultural environment and farm productivity in view of the great scarcity of agricultural land in the country. For the groups to be compact and economically viable, the study suggests the principle of 'solidarity and scale' (p. 81), meaning thereby that the groups should be small enough to forge the feeling of oneness and large enough to reap the benefits of large scale organization. However, no organizational size is prescribed and it is said to vary from task to task.

Last, the study points to the experiences of China, North Vietnam and Taiwan where such group action has proved to be highly productive. In India too it is expected to greatly enhance the labour intake of agriculture and farm productivity through participation of small farmers also in the transformation. It is noted that there is no dearth of agricultural knowledge developed elsewhere. What is needed is a proper organization to fully benefit from this knowledge. For making the group action succeed, it is suggested to order the recalcitrant through taxes and penalties (pp. 91-92), make the CD bureau-

cracy more flexible and less status conscious and invest the Village Level Worker (VLW), to start with, with the responsibility of starting the change.

It is highly unlikely that any worthwhile group action on the lines indicated by the study can be foisted amidst the glaring inequalities in the ownership of agricultural land. The idea of itinerant agricultural technologists is good, but is quite unlikely to be accepted by the desk-bound bureaucracy. The VLW has been proved quite unequal to the gigantic task of organizing some millions of voluntary agricultural brigades. Yet, new ideas in which the book abounds are always welcome. In addition, the study gives a brief glimpse of the tasks faced by Indian agriculture so far and the great organizational task ahead of it.

J. S. NARAIN RAO

*Land Problems and Land Reforms (A Study with reference to Bihar)*, Gyaneshwar Ojha, Sultan Chand & Sons, New Delhi-2, 1977. Pp. xxiv+327. Rs. 45.00.

This book is almost the first economic assessment of the implementation of land reforms policy in India. Ojha has demonstrated how gradualism, which is the bane of India's so-called democratic methods in contrast to the authoritarian practices of communist regimes, has been the major source of fiasco in the Indian Government's policy with regard to land reforms. He has treated the subject of land reforms both as an instrument of social and distributive justice and as a measure of raising agricultural output. With these twin objectives in view, Ojha has ably analysed in the light of his case study of Bihar, the misfortunes of land reforms in India and concluded that the ideal type of agrarian system in India is "tenancy with fixed kind rent". To be successful, tenancy, Ojha suggests, must be supplemented with crucial farm inputs like bank credit, technical extension services and proper marketing. This the readers must regard as the most positive contribution of the book to the present-day problem of subsistence cultivation in India as practised by the teeming millions of small and marginal farmers.

Tracing the history of India's agrarian system, the author describes how the British rulers had created the Zamindari system in order to get over political opposition. This system led to the concentration of land in the hands of moneylenders, traders and big landlords; and a process of sub-infeudation set in, leading to an immensely complex revenue system. The zamindars were conscious only of their own interest; they hardly took any trouble for the improvement of land and agriculture. It is generally accepted that the Zamindari system restricted the growth of agriculture in India: it retarded the overall improvements in land and adversely affected the agricultural output.

The abolition of the Zamindari system was the first and foremost task of State Governments after Independence. Bihar became the first State to enact legislation in that direction. Ojha refers to the several loopholes of the land reform legislation and describes how its enforcement in practice was slow and ineffective due largely to the hesitant and halting approach of the ad-



ministration. To sum up, the Government failed in abolishing the rent-receiving class, thereby making little impact on the lot of under-privileged persons in the rural areas. The failure of land reforms in India can be attributed to the dominance of socio-economic forces which obstruct and influence the implementation of law. In the event, Government land reform policies, from an economist's viewpoint, have made more noise than sense.

As a sequel to the *de jure* abolition of Zamindari in India, the Government pursued a policy of a 'ceilings' on land holdings and redistribution of the surplus land amongst the landless labourers and owners of 'uneconomic' holdings. The objective was to achieve distributive justice in agricultural land and to raise agricultural output. Ojha's analysis shows that the holding sizes prescribed under the law were loose and arbitrary, and hence needed revision from time to time. The Government policy of land ceilings has been diluted in the course of implementation, largely due to the lack of political will. As a result, the performance of the Ceilings Acts in various States has been found to be dismal. In effect, the vested interests did not allow the law to succeed; and the position of big land holding families has remained almost unaltered in the rural areas.

In these desperate circumstances, agricultural improvements could have been expected through the consolidation of holdings and prevention of fragmentation. Here also, Ojha has concluded that the progress of consolidation work in Bihar was slow: "With this pace of progress it will take many decades to consolidate all the holdings." In a nutshell, all Government efforts at structural improvements in agriculture were nipped in the bud due to the emergence of rural elite who assumed political dominance in order to preserve their vested interests.

It is noteworthy that all the land reform measures and other structural improvements that the Indian Government has sought to introduce in the country have had little impact on the rural economy. Ojha has vividly described the abysmal spectacle of rural Bihar on the basis of data given in the Population Census and the Agricultural Census 1971. This may be further corroborated here by summarising the findings of the All-India Debt and Investment Survey (AIDIS), 1971 conducted by the Reserve Bank of India.

According to the AIDIS report, the average value of assets per rural households is relatively high in Bihar, and the asset distribution as amongst the rural households more unequal than in other States. In Bihar, 94 per cent of the rural households are directly engaged in agriculture: 80 per cent as cultivators and 14 per cent as agricultural labourers. It is noteworthy that 84 per cent of the cultivator households had small holdings, 28 per cent owning less than half an acre or nil, 37 per cent between 0.50 and 2.50 acres, and 19 per cent between 2.50 and 5 acres. It is also reported that 90 per cent of the agricultural labour households were poor, that is having assets upto Rs. 2,500. These data depict the magnitude of the task which Government must attend to in respect of small cultivators and the vast majority of agricultural labourers who make their scarce living on land. Apart from creating local opportunities of wage employment, what is needed is raising their resource

base through redistribution of land and bank loans so that their economic lot is improved through self-employment.

The most revealing assessment that Ojha makes in the book is that the Government policy of land reform has failed to alter the pattern of land ownership or land operation. On the other hand, it has led to further intensification of the tenancy system, giving birth to a new class of poor farm servants. The author has drawn the reader's attention to the emergence of another adverse factor on the agricultural front, *viz.*, the gradual shift of agricultural landlords to non-agricultural occupations. Ojha suspects that the former absentee landlords are now being replaced by a new class of large farmers-cum-landlords. Moreover, one should imagine that the outgoing landlords had been 'denuding' the soil for several years, following a sort of 'scorched earth' policy, and leaving the land 'sick'.

To meet this situation, Ojha has recommended that the Government should step in at this point and acquire the land from outgoing landlords and redistribute the same amongst small farmers on fixed kind rent basis. Moreover, the tenure reform should be integrated with institutional assistance by way of credit, technical know-how and marketing. This, the present reviewer would like to assert, is an implicit acceptance of his long-cherished view that State is the sole landlord in the country, giving 'long-term' tenancy rights to farmers without permitting sub-letting or transfers. The system of fixed kind rent for the given tenancy term should be made to fulfil also the Government policies of farm produce procurement and revenues.

This reviewer is a sincere advocate of land reforms. That land reform is neutral to agricultural improvements is a myth. Those readers in India who still have faith in the principles of land reform but are disillusioned with the Government handling of land reform should find solace in Wolf Ladejinsky's Selected Papers: Agrarian Reform as Unfinished Business, edited by Louis J. Walinsky. Ladejinsky stressed the stability-inducing consequences of land reform. He recommended land reform with a view to preserving the democratic values; he argued that Western-type democracy could work only if the peasants gained a stake in land. He genuinely favoured distributive justice for the peasants. He argued that when the dispossessed and under-privileged become landowners, they would serve as a sure bulwark against communism. Here is another prescription for direct assault on poverty instead of relying on the *slow* and self-defeating percolation theory of economic development especially in the midst of sharp socio-economic inequalities: a sure step to preserve democratic values. Alas! due to the political dominance of the rural elite and of bureaucrats in the administration, land reforms in India were not framed earnestly and their implementation remained half-hearted throughout. In order to self-preserve and in the absence of an imminent rural threat, they argued that rapid industrialisation would pave the way towards economic development and that agricultural improvements shall follow, land reform or no land reform.

We must understand the shrewd politics that works against all structural



reform, and we must not lose faith in the essential correctness of such reform. We will tend to agree with Norman Macrae's assessment of the Western-type parliamentary system under which the Government has re-generated into a public-sector imperialism. According to him, the decision-taking power is in the hands of two groups, *viz.*, 'Political Bureaucrats' and the 'Official Bureaucrats' who are in league with each other. Public-sector imperialism in democratic countries is not going to be rolled back by the elected MPs; "Monk's don't dissolve Monasteries".

All land belongs to the nation; the Government is its sole owner who should lease it out to actual users. This law applies to all land, rural or urban, farm or non-farm. Individual persons cannot own land. Ojha has put forward a truly economic concept that fixed kind rent should be charged from tenants. This is ample food to provoke further thought and discussion at least in the academic style if a quick and drastic solution is to be found to the appalling lot of Indian peasants. Otherwise, the entire burden of raising the rural masses from the quagmire of rural poverty is going to fall on the banking institutions who in the process, one fears, may go bankrupt.

RAJENDRA KUMAR

*Crop Management Economics*, Allan N. Rae, Granada Publishing Ltd.; Crosby Lockwood Staples, London, 1977. Pp. xi+525. £ 12.50.

The book under review is an attempt to emphasize the economic theories leading to the derivation of economic principles for rational decision-making in crop management. The book consists of 14 chapters. The first four chapters attempt to provide the theoretical framework of elementary production economics. The remainder of the book attempts to deal with the theory of decision-making through time and under uncertainty.

The first chapter deals with the need for management, the nature of crop management, the processes of decision-making and includes an outline of the book. The chapter lacks cohesion of different topics discussed and is full of rambling statements and paragraphs. For example, the second para of p. 3 and the first para of p. 5 could easily be skipped as p. 6 repeats the discussion contained in these pages.

Chapter 2 discusses the production function concepts with relevant theoretical aspects without introducing input-output prices which are discussed in the next chapter. Necessary conditions for profit maximization and cost minimization are discussed. The sufficient conditions for profit maximization and cost minimization are discussed in Chapter 3 but the reader gets piecemeal information in this chapter. This chapter is again devoted to a discussion of the use of production function in economic analyses with the help of hypothetical or actual examples (the decision about actual or hypothetical examples is left for an intelligent guess by the reader). An element of confusion is introduced by the author in presenting the tables of this chapter in monetary terms. Some tables (3.1, 3.2, 3.3) have been

expressed in pound sterling, whereas some tables (3.4, 3.5) have been expressed in dollars (American, Australian, Newzealander?). On the other hand, Table 3.6 has both, that is, pound sterling as well as dollars. By combining Chapters 2 and 3, the author could have been able to present the discussion precisely, thus reducing the size of the book and also avoiding rambling treatment of the subject. This should have also given an opportunity to the author to discuss profit maximizing and cost minimizing concepts clearly and explicitly.

Chapter 4 entitled "Resource Allocation for the Multi-Product Holding" is a well-organized and clearly written chapter. However, the isoquant diagrams presented in Figure 4.12 of this chapter could have been better discussed in Chapter 2 or 3.

Chapter 5 deals with budgeting for planning and control, complete and partial budgeting, the evaluation and specification of alternative plans, monitoring performance for control, parametric and break-even budgeting, costing and selection of machinery and buildings and data collection for budgeting. The treatment given to the discussion on data requirement for budgeting is too elementary and insufficient. In fact, the next Chapter 6 entitled "A Case-Study in Static Budgeting" discusses and illustrates the data requirement for budgeting in greater detail. This chapter is well organized and could have been further improved to avoid duplication by combining it with Chapter 5. Chapter 7 entitled "Planning for Maximum Profits" deals with the elementary concepts of linear programming, parametric linear programming, integer programming and quadratic programming. In fact, this chapter should have been better titled as "Graphical presentation of programming models for profit maximization".

Chapter 8 entitled "Linear Programming Models for Crop Systems" is a further extension of the elementary linear programming concepts developed in Chapter 7. Hence, the redundancy of Chapter 7 is obvious. The use of linear programming model in cost minimizing or to get the least cost combination of factors of production is not discussed in Chapter 8. The discussion is mainly concentrated on the maximization of profit. The author does it because perhaps he believes that "Maximisation of the objective function value would reveal the least-cost factor combination, which is equivalent to minimising the value of the cost equation . . . subject to an output restraint" (p. 213).

Chapter 9 discusses intertemporal choice problem using utility function approach. Formulas for discounting and compounding and other choice criteria such as rate of return on total capital, rate of return on own capital and internal rate of return are also discussed.

Chapter 10 entitled "Intertemporal Budgeting" discusses evaluation of intertemporal cropping alternatives, borrowing and its cost, borrowing and the discounted cash flow (DCF) technique, evaluation of alternatives if DCF is inapplicable, choice of the planning period, replacement of durable inputs and again intertemporal linear programming. The section on inter-



temporal linear programming should have been discussed in Chapter 8 along with linear programming models for crop system. Chapter 11 presents three case-studies in intertemporal budgeting which could have been discussed or combined with Chapter 10.

Chapter 12 is entitled "Management and Non-Certainty" and discusses the influence of non-certainty on decision-making, decision analysis under non-certainty, probability theory, maximization of expected monetary values, utility theory and maximization of expected utility. The discussion on the decision trees analysis and maximization of expected utility seems rather casual. This reviewer would have liked the author to discuss the elements of Bernoulli's Principle as well as the decision trees analysis and their use in the real world decision-making with the help of actual crop management decision problems, illustrating the estimation of certainty equivalent and empirical estimation of the farmer's utility function.

Chapter 13 entitled "Probabilistic Budgeting" discusses the estimation of probabilities, estimation of utilities, mean-variance analysis, intertemporal budgeting and non-certainty, mathematical programming and non-certainty including discrete stochastic programming, quadratic risk programming, simulation and 'economics of problem solving' without any economic content. This reviewer would wish a more serious demonstration of the practical use of different concepts discussed in this chapter for efficient crop management.

Chapter 14 entitled "Marketing Management" deals with marketing process, price determination, competition between marketing firms, determination of the marketing programme and the use of marketing intelligence. At the end of the book, chapterwise references and further reading list are provided. In the Preface to the book, the author claims that "the book is intended for use at both the undergraduate and graduate levels" (p. x). However, the important omission of the book is that it does not contain any laboratory exercises. In fact, in each chapter a couple of laboratory exercises should have been given for use by the interested reader. The price of the book is too high and is certainly beyond the reach of an average Indian student. The book may, however, be used as a reference material by the libraries.

I. J. SINGH

*Mahatma Gandhi on Human Settlements*, Compiled and Edited by S. M. Shah, The Navajivan Trust, Navajivan Publishing House, Navajivan, Ahmedabad-14, 1977. Pp. xiv+62. Rs. 3.00.

S. M. Shah's compilation is very topical. With the popularity of the rural development strategies, it is important to know the earliest thinking on the subject and trace the development of ideas since then. The compilation covers the views of Mahatma Gandhi between 1921 and 1947 on ideal village, village and city civilisations, appropriate industrialisation strategies for making the village self-reliant and employment opportunities for village

populations. The most striking thing is how modern was Mahatma Gandhi even in the early twenties: and it is a pity that we still talk in the same terms that he used, despite lack of implementation.

The immediate proximate cause leading to the compilation and publication has been the Habitat-1976 UN Conference on Human Settlements in Vancouver. The Conference recommended that developing countries should pay greater attention to improving living conditions in the rural areas: Mahatma Gandhi evinced great interest in improving human environment and wanted to develop appropriate patterns of population distribution. That is the relevance of his ideas to current thinking on the subject.

Villages of Mahatma Gandhi's world were not isolated and remote spots. They were to depend upon cities for the markets: the cities were to be clearing houses of village products. By restoring the links between village and city life, and developing a 'rural mindedness', he was advocating equality between town dwellers and villagers in the standard of food, drink, clothing and other living conditions.

Shah has brought out the essentials in Mahatma Gandhi's thinking very well. The contrast between village and city civilisation is in two elements. First, the city civilisation is highly competitive and destructive, the village civilisation is based on co-operative ideas when "circumference will not crush the inner circle" and "no one is to be the first and none the last." Second, industrialisation and mass production, the basis of city civilisation, are of comparatively recent growth and we do not know how far they have contributed to our happiness. On the other hand, the handicrafts civilisation has nurtured us in the past and if the hand and the intellect are correlated, it will not only give joy of work, but also increase our capital thousand times.

Mahatma Gandhi's advocacy of India lives in villages was based on his two convictions: first that education of villagers through handicrafts will spearhead a silent social revolution that will have far-reaching consequences, and second that it will save the towns from the lifelessness into which they are sinking.

Villages, often described as dung-heaps have to be turned into model villages, things of beauty, according to Mahatma Gandhi. They must have perfect sanitation, light and ventilation, they must be free from dust, must have houses of worship, meeting place, common grazing ground, schools and must produce their own grains, vegetables and fruits. The idea of village *Swaraj* is that the village should be a complete republic, independent of its neighbours for its own vital wants and yet inter-dependent for many others in which dependence is a necessity.

Long ago, even before the problems of industrialisation were realised by many, Mahatma Gandhi had said that "my views on national planning differ from the prevailing ones. I do not want it along industrial lines. I want to prevent our villages from catching the infection of industrialisation. . . . Pandit Nehru wants industrialisation, because he thinks that if it is socialised, it would be free from the evils of capitalism. My own view is



that the evils are inherent in industrialism, and no amount of Socialisation can eradicate them." After a generation of the working of the public sector, we are now realising the truth of what Mahatma Gandhi said years ago.

Shah's selections clearly show how Mahatma Gandhi's advocacy of Khadi and village industries rested on different footings. Any other industry may be developed through machinery, but according to Mahatma Gandhi, the supply of cloth to crores of people through mills is an economic blunder of the first magnitude. Further, he adds, there is no better way of industrialising the villages of India than the spinning wheel. Without it India's problem of poverty cannot be solved. Thus the spinning wheel is the sun in the village system of India. On the other hand, the various village industries are like planets revolving round the sun. Without the sun, the planets are nowhere.

Shah has performed a difficult but vital task so well, in bringing together these ideas at one place. After more than a generation of experimentation, we are now coming back to rural development and village industries as conceived by Mahatma Gandhi.

S. G. SHAH

*Bio-Gas Systems in Asia*, S. K. Subramanian, Monograph No. 2, Management Development Institute, New Delhi, 1977. Pp. x+146. Rs. 25.00.

The book is the outcome of a field investigation undertaken by the author of a large number of bio-gas plants (establishments) in different parts of Asia, and of analysis of information and experience gathered from those visits and surveys. Though the emphasis seems to be more on the prevalent system in India, the book also adequately deals with those prevalent in the Republic of Korea, Thailand, Indonesia, Philippines and Japan. In fact, the book has been very appropriately named as "Bio-Gas Systems in Asia", and this is exactly what one learns from Chapter II through Chapter IV of the book. The main objective of the study is to throw light on the considerable diversity in the types of bio-gas systems that have been developed and operated in Asia. The study has been divided into six chapters. The introduction gives a very brief account of the techniques of the bio-gas system in general and its importance as a source of energy and of organic fertilizer. The second chapter deals with the 'State of the Art' of bio-gas system indicating the operation and maintenance of such plants in different parts of Asia. The third chapter gives a fairly detailed account of technological aspects of the plant which would be of interest to the Research and Development Agencies engaged in evolving a design of the plant which is cheap and suitable under local conditions of operation. Social and economic issues and the problems of evaluation are dealt with in Chapters IV and V respectively and this reviewer feels that these two are the most important chapters of the book wherein the author raises a number of crucial

issues involved in economic evaluation of the bio-gas plants both from the individual user's point of view and from the point of view of the society. Chapter VI gives a very brief summary of the main points raised in the entire study.

It is a fact and is also borne out by this study that the use of bio-gas plant is still restricted only to some selected villages particularly and has not yet spread over a wide rural region. This situation arises mainly because of two factors, *viz.*, technical constraints and the economic consideration in the installation of a bio-gas plant. Whatever might be the state of art in different parts of India in particular, and Asia in general, the most crucial technical constraint in commissioning even the smallest size of such plants (which is 2 cu.m. in India) is the minimum head of cattle required; and this turns out to be 3 according to a number of studies made in India. Hence only those households which have 3 or more head of cattle can go for bio-gas plants. The gas produced from the droppings of three cattle would barely meet the cooking requirement of an average household of five members, mainly because of the fact that the cattle, by and large, are not stall fed and consequently only two-thirds of the dung would be available for use in the gas plants.

Secondly, the economic consideration: in some of the studies dealing with the economics of bio-gas plant from the point of view of individual users, it is estimated that the annual cost (capital + interest) of a 3 cu. m. plant works out to about Rs. 380 considering an interest of 10 per cent for a period of 15 years. This is after accounting for a subsidy of 20 per cent of the cost of gas plant. It is obvious that only those households which spend more than this amount annually on fuel for cooking may consider to go for bio-gas plants. Presumably, very few small farmers' households can afford an annual expenditure of such an amount for cooking purposes. Even if a subsidy of 75 per cent of the cost of the plant is offered, hardly any of the household falling in the category of 'weaker section' can afford to keep 3 or 4 head of cattle.

Further, the output of the gas plant, the gas, is used as final consumption good for cooking and/or lighting and there is no tangible return from it. The small farmers' households may be looking at it as a luxury item for which the households are not prepared to commit any capital cost, more so when the alternative source of fuel for cooking (firewood) is available to them either free or at a very nominal cost. In such households there is plenty of free time particularly for the women folk. In other words, the opportunity cost of labour in such households, particularly for the women folk is near zero. In view of this, the extended time spent in collecting the firewood and on cooking is of no consequence to them. This issue has not been raised very pointedly in this book and it merits serious consideration in propagating the utility of such plants.

As mentioned by the author, most of the gas plants in operation are individual plants, the community gas plants are very few in number and in many cases are still in the experimental stage. The operational difficulties



of commissioning community gas plants are many and most of them don't seem to be easily surmountable.

While dealing with the use of gas the author discusses its use mainly for cooking purposes and to a very limited extent for the purpose of operating engines for lifting water or in some industrial uses. Another important sphere of the use of bio-gas is for lighting both domestic and public, which does not get even a passing reference in the present study. It is worthwhile examining the use of gas for domestic and street lighting in the rural areas particularly in the context of rural electrification. In areas where the potentiality of the development of load is very poor, but which still are electrified at considerable costs just to meet the demands of some domestic users and also to meet the demands of village street lighting, the use of bio-gas plants as best economic alternative for the same purposes may be explored.

It is indeed surprising to note that there is less awareness and appreciation of the manurial value of the digested slurry in most other countries of Asia. This may be by and large true of the urban area, but in the rural area with agriculture as the predominant activity, the extra nutrient value of the digested slurry should catch the imagination of the farmers with some demonstration and extension activities. This reviewer feels that in India at least the rural households using bio-gas plants are aware of the additional manurial value of the digested slurry and that acts as an added incentive to install such plants.

While dealing with the problems of evaluation of the social benefits and costs, the author has rightly pointed out the location specificness of the plants which will influence the costs and benefits in a significant way. However, to argue against considering social cost of land for the plant as zero in the rural areas does not seem to be very convincing because most of the studies show that the rural households having bio-gas plants had no alternative use of the very small piece of land required for the gas plant and also to a great extent for the pit. No generalisation on the remunerativeness of the system is possible and desirable, evaluation of the bio-gas system in each region and/or area has to be specific with respect to the conditions prevailing. But it is possible to internalise a large number of externalities in each area in order to bring about a proper evaluation of the system.

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