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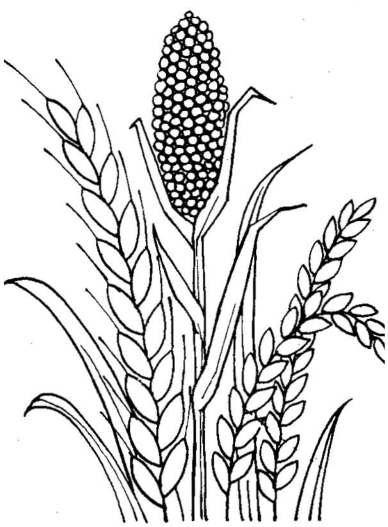

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BOOK REVIEWS

Some Economic Aspects of the Bhakhra Nangal Project: A Preliminary Analysis in terms of Selected Investment Criteria, K. N. Raj, Asia Publishing House, Bombay, 1960. Pp. xii + 140. Rs. 11.25.

Originally proposed as an investigation into the employment potential of the Bhakhra Nangal Project this study was extended to become an "exploratory analysis of the more important theoretical and practical issues relevant to the choice and application of investment criteria in relation to projects of this kind." (p. 3). With this extension the emphasis shifted to methodological issues to such an extent as to make the part relating to the Bhakhra Nangal Project only incidental to this study. As Raj remarks in his "Concluding Observations": "It (this study) was not meant to be an exhaustive analysis of the Bhakhra Nangal Project as such. The emphasis has been primarily on the theoretical and methodological issues involved. The facts brought out about the Bhakhra Nangal Project itself are, from this point of view, incidental to the anlysis. "(p. 124). The title of the book therefore, somewhat understates the high-level objectives of the analysis attempted. It is therefore necessary to judge the book in the light of this methodological and theoretical objective rather than with reference to the Bhakhra Nangal Project as such.

Raj begins by observing that in a programme of development a series of decisions have to be made chronologically beginning with the *rate* of investment, the distribution of this investment between different categories like, agriculture, industry, etc., the *location* of investments in each sub-category, the *design* most preferable among possible alternatives and the related problem of *techniques* of construction. Raj is concerned with the last three in this book, *i.e.*, given the investment allocation and alternative technical and locational possibilities, how are alternative projects and project designs to be ranked and selected ? What are, in short, the criteria for such choice ?

Investment projects can be evaluated technically, financially (or economically) and socially. The technical issues involved in the selection of projects cannot be judged *per se* but only as they affect the economic and the social estimates of costs and benefits. Raj rightly insists that the social appraisal should have precedence over the economic in making the final choice.*

Raj discusses theoretically the social costs of employment of unutilised labour, of materials and machinery and equipment, of the time element involved in investment and then the estimation of the social product, in Chapter II. In Chapter III the labour content of the costs of the Bhakhra Nangal Project and the alternative technical variants and the range of choice regarding the direct products of investment are discussed. Problems connected with the employment of labour in the construction of the project are discussed in Chapter V. The next two chapters discuss the targets in respect of irrigation and electricity and the pattern

* The divergence between the private product and the social net product is at least as old as *Pigou's Economics of Welfare*, if not older. Raj unnecessarily gives the impression that this divergence is something of a rather recent discovery and that it is much more relevant in underdeveloped economies than in developed ones.

of their utilisation, etc., respectively. Chapter II and VII contain most of the methodological and theoretical discussion and may be regarded as the core of the book.

For a methodological discussion which Raj aims at, it is necessary to set out briefly the whole field of the economic and social evaluation of an investment project and to indicate the scope, in this broader context, of the discussion attempted. Raj does not do this at any place in the book. But for a proper appreciation of the work, it is necessary to do so. I will try to do this below as briefly as possible to put this study in its proper context.

The economic evaluation of a project is of primary importance in this connection because social evaluation is a further refinement of this basic calculation. In economic evaluation it is customary to calculate the economic costs and benefits of an investment, to put them on a comparable basis (usually annual) and to evolve a cost-benefits ratio on the basis of which different investment projects can be compared. The calculation of economic costs and benefits really begins when the phase of construction of a project is complete. The expenditure incurred in construction is taken to represent the fixed capital costs of the project, there being no economic benefits accruing to the investor during this phase. When the capital work begins to be operated, benefits and costs at the primary, secondary, tertiary, etc., stages are calculated. The costs relating to fixed capital (interest on capital at charge, depreciation, etc.) are reduced to an annual basis and to them are added the annual current or operating costs and the annual associated costs at the primary, secondary, tertiary, etc., stages. The gross benefits are also similarly reduced to an annual basis and then a benefits-costs ratio is calculated. If this exceeds unity the project is economically considered a sound proposition. However, projects cannot be selected merely by the excess of benefits over costs on an annual basis in all cases. The calculation of an internal rate of return from this becomes necessary for final selection from among different projects.

On the basis of these calculations the social costs and benefits can be estimated. One important difference in this estimation is that the calculation of social costs and benefits begins with the beginning of the construction of a project. The effects of the capital expenditure such as expansion in employment, etc., have socially beneficial effects that go to reduce social costs of construction. On the other hand social costs can be greater for some items than their actual economic costs, such as, for example, the rate of interest on capital or foreign exchange component of construction expenditures, etc. In the operation phase the problem is largely one of converting economic costs and benefits into social ones. The benefit-cost ratios in social terms can be also calculated broadly along similar lines and so too can be tackled the further problem of choosing between projects.

Raj's discussion is concerned solely with social costs and benefits during the phase of construction. The operation phase receives very perfunctory attention at his hands. Obviously, therefore, Raj is concentrating on a narrow section of the whole field and is not discussing or even touching upon many other matters without which the final selection of projects cannot be made. The narrowness of the sector covered by Raj need not be complained about. After all an author is perfectly free to choose his own sector and to delimit it as he pleases. But it is necessary, particularly in a methodological discussion such as Raj emphasises he is engaged in, to indicate in the context of the broad problem that is being discussed the particular sector that is being chosen for the discourse and to indicate the weight it carries in regard to the ultimate decisions in the whole field. Raj does not do this. This is likely to be easily misunderstood and should have been avoided in a methodological discussion.

Within the narrow field that he covers Raj discusses, as noted before, the social cost of unutilised labour, materials, machinery and equipment and the time element in investment. He also discusses the estimation of the social product. This discussion is done with the usual flair that one associates with Raj and is quite competent. But it is far from original or new or even adequate from the methodological point of view. To mention only one among several other lacunae, Raj does not make clear the non-exclusive character of the elements of social costs and benefits he separately discusses. He discusses the social benefits resulting from employment and emphasises that the method or design that uses more labour than machinery would have lower social costs or higher social benefits. In the discussion of the time factor he discusses social costs that are involved in designs that have long gestation periods as against those that have short ones, the problem arising mainly because the former are often more productive than the latter. (p. 25). There is therefore the possibility of some of the gains on labour intensive designs being negatived by the increased costs of time if there is a lengthening of the gestation period because of the choice of labour intensive techniques of construction. Raj does not bring this out. Again, if the same design of a project can be executed with more labour over a longer period, say, 15 years, as compared to its construction with the aid of mechanical equipment in a shorter time, say 10 years, the cost of time here presents a different problem. Here again the social benefits flowing from larger employment are offset by the higher social costs involved in the lengthening of the construction period without any difference being made to the ultimate productivity of the project.

Leaving these alone, and supposing that all these problems are adequately solved and all the social costs and benefits of a project are calculated, what should be the criterion of final selection from among possible projects. Raj does not explicitly indicate this but it appears implied in the discussion that projects should be ranked according to the excess of social benefits over social costs and those showing the highest excess, should be chosen within the total investment constraint. Raj does not seem to be aware that this criterion does not work infallibly in all cases.

Precise demarcation of the scope of discussion in the context of the total problem, importance of the issues discussed in the decisions in the total field, a thorough treatment of all the problems arising in the field chosen, and a good aquaintance with at least important previous discussions in the field are very essential for a good methodological discussion. Raj's discussion does not meet this test and in consequence the methodological discussion is unsatisfying.

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