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BOOK REVIEWS

Economics of a Multi-Purpose River Dam: Report of an Inquiry into the Economic Benefits of the Hirakud Dam, N. V. Sovani and Nilakanth Rath, Gokhale Institute of Politics and Economics, Poona, Asia Publishing House, Bombay, 1960. Pp. xvi + 389. Rs. 20.00.

This study, undertaken by the Gokhale Institute of Politics and Economics at the instance of the Government of Orissa, presents the results of an inquiry into the economic benefits of the Hirakud Dam. According to the terms of reference laid down, the Institute was to carry out "a comprehensive socio-economic survey of the area affected by the dam to collect benchmark data for comparison with the future" and attempt an appraisal of the benefits of the project "both in the short and the long period."

The benchmark data relating to the area covered by the project are a very useful part of the report, particularly for those who might undertake studies in this region in the future. The commanded areas of the dam have been subjected to a detailed sample survey, and information collected on occupational pattern, land holdings, agricultural output and costs of production, income of households engaged in non-farm occupations, net value added in industries, income from trade and services, remittances from outside the region, etc. On the basis of the data so collected, an attempt has also been made to estimate the total net income, in 1954-55, of the region covered by the dam.

The more interesting problems arise, however, when one turns to the concepts underlying the projections of the future. Some of them are very crucial to an evaluation of the results. The report draws a distinction initially, between " short-term" and "long-term" benefits, on the following basis :

> "Even after a dam is completed it requires a certain time for the tract affected to adapt itself to new conditions. The farmers have to adopt new methods of farming, new crops, etc. and to make the necessary investment. It is the same with new users of electricity. Roughly speaking, most of the primary benefits would begin to flow fairly fully *at the end of five years*[1] after completion of the project. The benefits flowing at the end of five years after completion might be termed the short-term benefits and estimated accordingly. In the period that follows, primary benefits will attain their peak and secondary, tertiary, etc. benefits will also progressively appear. The system as a whole might be expected to reach its stage of maturity at the end of 25 years after completion. The long-term estimate of benefits will cover the benefits arising at this point of time." (pp. 16-17).

The "primary" benefits, it may be pointed out, are taken to cover the increase in agricultural production resulting from irrigation (p. 15), but the increase in industrial production which the provision of electricity makes possible is regarded as a "secondary" benefit (p. 203).

1. Italics mine.

Both irrigation and electricity are intermediate goods, and why the increase in output resulting from one is taken as a "primary" benefit and that from another as a "secondary" benefit may appear a little puzzling. An explanation can, however, be found in the statement that the distinction between "primary" and "secondary" benefits "rests mainly on the chronological sequence in which the benefits arise and the closeness of their connection with the investment whose benefits are being studied" (p. 15). Since utilization of irrigation for increasing agricultural production requires supplementary investments in the same way as utilization of electricity for increasing industrial production, the closeness of the connection with the investment whose benefits are being studied is obviously much the same. The implication is, therefore, that the difference in treatment of the two is based on a presumed chronological sequence, namely that the increase in agricultural production resulting from provision of irrigation is necessarily realized earlier than increase in industrial production resulting from greater availability of power. This appears somewhat questionable.

As the work on the Inquiry proceeded, some further thought seems to have been given to the definition of the "short term" and also to the time sequence of the effects of irrigation on agricultural production. Short term benefits are later re-defined (p. 137) as those flowing "*at the end of ten years*[2] after the completion of the dam or ten years after the irrigation waters are made available," though no awareness is shown here in the report that the period fixed earlier was five years and that in making it ten years there was involved a change of some significance. Secondly, a distinction was made between "irrigated farming with the least cost and adjustment" and irrigated farming "at its full potential" (p. 137). It was only the former that was expected to be realized in ten years, and in fact it is only the increase in agricultural production and income corresponding to this that has been estimated in the report.

This concept of "irrigated farming with the least cost and adjustment" is an interesting one, on which much else in the report turns. What the authors mean by the concept will be evident from the following extract :

> "The basic assumption of the estimate attempted here is that in the ten years that will elapse after the irrigation waters begin to flow to the fields, the area will just settle down to irrigated agriculture with the least possible change in technique or capital investment or crops or seeds, etc. The peasants will grow more than one crop where they were growing one before but the crops will be such as they know of and the methods will be the same as they at present practise. The costs will be about the same as they incur today in respect of the different crops under present irrigated conditions." (p. 137).

How is one to determine the crop pattern and yields that can be expected to emerge in the newly irrigated areas with "the least possible change in techniques or capital investment or crops or seeds"? The least possible change could correspond, it might seem, to the case where there is no change at all in the crop pattern. Obviously, that is not what is meant. The crop pattern involving "the least possible change" is identified with the crop pattern in adjacent irrigated areas in the region, with comparable soil and climatic conditions.

2. Italics mine.

Difficulties still remain. First, if it takes 25 years for the full benefits of irrigation to mature in any area, is it consistent to assume at the same time that the pattern obtaining in areas which may have had irrigation for 25 years or more will be realized in newly-irrigated areas in 10 years ? Second, what is one to do if, as in the Sambalpur area covered by the Hirakud project, existing irrigated farming is limited to a very small proportion of the total cultivated area, and thus can offer no firm basis for any kind of projection of the pattern that might emerge in the newly irrigated areas ?

Since the whole thing thus becomes to a considerable extent an exercise in determining the nature and extent of inertia among cultivators in relation to new opportunities, the projections of the future are inevitably based on a number of arbitrary assumptions. This is conceded in the report itself.

> ".....there are still an almost infinite number of crops, combinations of their distributions and their rotations that can be technically feasible and can be suggested. Many of these, it is quite possible, will be as good as any other and there will be hardly any criteria decisive enough to choose between them. The fun of the situation is that any or none of them may be actually realized in practice because what will develop in the field will depend very much on what the peasants will actually do and how they will react to the whole situation. In the circumstances, it is obvious that we can only choose a certain crop pattern which, in our judgement based on the information available to us and within our technical competence, appears to us the best. In the final analysis, the choice will be necessarily arbitrary." (p. 139).

It is not clear what precisely is meant here by "the best." No economic criteria have been indicated for determining the best of the technically feasible alternatives; indeed it is implied that no criteria may be decisive enough to form the basis of choice. Nor is "the best" claimed to be that which the cultivators are, in fact, likely to adopt. Thus the estimate of short term benefits given in the report is not a forecast of what is *likely* to be realized in ten years of the completion of the project; and, since it is assumed that there will take place during this period only "the least possible change in techniques or capital investment or crops or seeds," it does not correspond either to what may be realized if the *really best* among the technically feasible alternatives is adopted in the region. It is a kind of cross between the two, reflecting in part the attempt to mix sociology with economics for a purpose for which neither is quite suited.

This raises the question whether it is the function of the economist to do this kind of forecasting of benefits. Economics is supposed to be concerned primarily with problems of choice. The decision to embark on a multi-purpose project of this kind does not depend usually on forecasts of this kind. Once the decision has been taken to embark on such a project, the next thing to consider is, what the areas are in which there is still scope for choice and on what considerations the economist will recommend one or the other of the alternatives open. But if the whole question of alternatives is, in effect, side-stepped, and only one alternative is considered on grounds of social inertia, what remains except to impute

the net value added in the case of each product and total it all up ? In other words, can the economics of a project of this kind be reduced simply to forecasting benefits on the basis of a fairly rigid set of assumptions ?

There is an alternative view possible of the functions of an economist. He can use his tools of analysis for indicating which among the technically feasible alternatives indicated to him is likely to maximize output or profit, given certain assumptions regarding the size of holdings, rents payable by tenants, availability of credit, prices of inputs and outputs, etc. He may perhaps also be able to indicate how the size of holdings, rents payable, etc., should be changed if a particular alternative that is preferred is to be adopted on a specified scale. His help will be particularly valuable if he is further able to show how the imputation of shadow prices on certain relevant considerations will affect the choice between alternatives ; and how, when the choice is in the hands of private agencies, the actual market prices might be changed in order to bring about the desired result. If he is doing any of these, he will be functioning well within his field of competence.

As pointed out, the estimate of future benefits presented in this report is not really meant to be a *forecast.* Nor can it be given the status of a *target* because there is obviously no reason why, under conditions of planned development, the authorities should limit themselves to what can be achieved with "the least possible change". This is what makes the whole effort seem so very unworthwhile.

Professor Gadgil shows a clear appreciation of these limitations in his very penetrating observations in the Foreword to the report.

> "What I want, in effect, to emphasize is that work such as that undertaken by the Institute in relation to this project is neither of great academic importance nor of much practical value. As a result, especially of the experience of this survey, I am convinced that the only way of dealing with problems of future operation and estimation is to set up teams of experts to evolve concrete programmes of development. As soon as any large work of irrigation goes under construction, joint teams of engineers, agronomists, economists and other experts should be put into the field to prepare expeditiously, integrated and properly phased programmes of all-sided development of the area under command *to be achieved within the least possible time*[3] . . . . . In such a concrete programme, the economist will have a valuable role to play, because he will be subjecting all alternatives in the programme to his processes of analysis and measurement and would be suggesting optimum arrangements and combinations from his point of view. The work will require the exercise of his technique at the highest level but it will be carried out with some assurance that the work would bear concrete fruit." (p. vii).

Professor Gadgil is over-critical of the results when he says that the work is of no great academic importance or practical value ; the conclusion arrived at as a result of the experience of this survey, namely that investigations of this kind are not of much value, is itself of considerable importance.

3. Italics mine.

The way in which the results of the investigation have been analysed and presented in the report reflects not only the systematic and thorough work that has been put in but the objectivity and detachment that have been preserved throughout by those associated with the project. Even negative conclusions, reached so scrupulously, can be of great value.

There appears to be incidentally, an error in the calculations on pp. 212 and 213 of the report. While Professor Tinbergen's suggestion has been incorporated, that a rate of interest of 10 per cent is more appropriate to the conditions in countries with capital shortage, no allowance seems to have been made for the period of ten years which is assumed to lapse before the estimated short-term benefits emerge. One of the main reasons for using a higher shadow rate of interest is to weight the scales more heavily against projects with long gestation periods; this is not served if the cost of the time involved in gestation is not evaluated at the higher rate. It will be found, when this is done, that the total capital cost of the project will be more than doubled over a period of ten years and that, therefore, the benefit-cost ratios will be less favourable than indicated in the report.

K. N. RAJ

Development Through Food: A Strategy for Surplus Utilization, Food and Agriculture Organization of the United Nations, Rome, 1961. Pp. viii+122.

The booklet explains in broad outline the case for utilizing the surplus food available in certain countries, particularly the U.S.A., for the development of underdeveloped countries particularly those suffering from food shortages. The chapter heads are as follows: Food as Aid; National Programmes requiring Food Aid; Requirements for an Expanded Programme of Food Aid to Economic Development; International Emergency Food Relief; Multilateral Functions and Arrangements; A Five-Year Programme; Conclusion. In an appendix is given the report of an Expert Group on the subject appointed by the Director General of FAO. The salient points, now well-known, are as follows: Food aid should be integrated in the overall development programmes of the receiving countries. The extent to which food aid could be utilized would depend upon the availability of other resources. The receiving countries should take special care to see that the food aid does not depress their own agriculture. There are three distinct ways of utilizing food aid for development purposes: It might be used in much the same way as commercial imports. It could then have a counter-inflationary effect and could avoid either cutting down the investment programme or cutting down food consumption by physical controls. It might be used for establishing national food reserves which would buffer seasonal and emergency fluctuations in the supply of basic foods and would help governments to implement domestic price policies. Finally, it might be used directly to initiate or accelerate certain social development programmes such as feeding of school children. Besides such national uses of the food aid by the developing countries, the surplus food could also be used for giving international emergency food relief. FAO has worked out a detailed plan for the same.

The booklet is of special interest to students of economics in India as it presents the economic rationale of the large food aid this country receives from the