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**RAPPORTEUR'S REPORT**  
**ON**  
**IDENTIFICATION, APPRAISAL AND EVALUATION OF**  
**AGRICULTURAL PROJECTS**

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The purpose of the session, as indicated in the Guidelines, is to discuss the peculiarities of agricultural development projects and the special problems which they give rise to in the identification, formulation and appraisal of such projects. The intention was to organize the discussion around studies of concrete projects and programmes. In all, 33 papers have been accepted for discussion and the large majority of them deal with specific projects of very different types ranging from farmers' training and regulated markets to major irrigation projects. For purposes of this report, they have been discussed under four broad themes: (i) Special Characteristics of Agricultural Projects; (ii) Processes of Project Formulation and Appraisal; (iii) Case Studies in Project Evaluation and (iv) *Ex Post* Evaluation. It needs to be noted, however, that the papers do not fall neatly into these categories. Since many of them fall into more than one category, there is necessarily some arbitrariness in the grouping.

I

SPECIAL CHARACTERISTICS OF AGRICULTURAL PROJECTS

K. M. B. Rahim and Katar Singh, M. D. Borkatky and A. K. Neog, and Sreelekha Basu highlight some of the features of agricultural projects which mark them out from projects in other sectors. Rahim and Singh draw attention, with concrete illustrations, to the greater importance of externalities, the fact that facilities provided by public sector agricultural projects are more often in the nature of public goods, the higher degree of risks and uncertainty associated with agricultural projects, and the importance of intangible benefits. Some of these peculiarities are also touched by authors of several papers dealing with specific projects under categories (ii) and (iv) but only in passing. Few of them spell out their implications for project formulation and appraisal.

Agricultural projects are technically more complex. Moreover, the effect of any particular project (as usually conceived) on output depends on factors external to the project itself to a far greater degree than in the case of typical industrial, energy or transport projects. For instance, even if an irrigation project is technically sound, the realisation of the output potential created by it is contingent on the existence of local institutions for making

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proper use of the facilities, on the actual working of these institutions, and on the speed of farmers' response in learning and adopting changes in farming techniques and practices necessary to get the potential output.

Secondly, there is a much more direct and immediate connection between project design and the distribution of benefits among potential beneficiaries in the case of agricultural projects than in most other sectors. For instance, an irrigation project can be designed to maximize the area benefited or to maximize the output per unit of water. The former course implies the widest possible diffusion of the benefit of irrigation as the overriding aim, while the latter implies a desire to get the largest possible increment to production from the given public investment. Since water is severely limited in relation to land, the two approaches involve very different designs and almost always a conflict of choice between equity and efficiency considerations. An explicit consideration of alternatives and their implications for the two objectives thus becomes imperative. However, the problem is complicated because the project concept can, and frequently does, get modified by the working of institutions at the local level, where the realities of differences in the power and influence of different groups of beneficiaries in determining actual allocation of water become decisive.

Third, in some agricultural projects (notably soil conservation in catchment areas, forest plantations and land improvement in low rainfall/drought-prone areas), the full benefits, many of which are quite indirect, are realised only after a long time, often as long as a decade or two. Such projects also interfere with the ecological system and generate considerable side effects (beneficial and adverse) which again take a long time to manifest and whose nature and magnitude are not always obvious. The example of Kuttanad project discussed by K. P. Kannan is an excellent case in point. To capture and evaluate these long-term consequences in project formulation and appraisal is therefore a far more important problem in agricultural projects than in most other cases.

Fourth, partly due to the influence of weather conditions which vary from year to year and partly because the outcomes of the project are determined by circumstances (farmers' response, institutions, efficiency of extension and input supply organizations, price variations, etc.) outside its immediate scope, estimates of costs of and returns from agricultural projects are subject to much wider margins of uncertainty. All these peculiarities have an important bearing on the formulation and appraisal of agricultural projects.

## II

### PROCESSES OF PROJECT FORMULATION AND APPRAISAL

A number of contributors have attempted a critical assessment of the existing practices of formulation and appraisal of different categories of agricultural projects. S. A. Radhakrishnan provides a good discussion of the technical problems of, and the information requirements for, formulating a

sound programme for development of well irrigation in Tamil Nadu. But he makes no attempt to relate this to the actual planning practice.

A. K. Sinha's *ex post* evaluation of three canal systems in Haryana takes a much broader view of the problem and highlights (a) technical weaknesses in the project (*e.g.*, failure to provide for the link canal to feed these systems, field channels and on-farm development works) as well as failure to work out the optimum water use patterns; (b) the lack of awareness of techniques of cost-benefit analysis among project designers; (c) the failure of irrigation engineers to involve agricultural extension specialists and economists at the design stage to check the validity of assumptions regarding crop pattern, yields and costs; (d) the attempt to justify projects conceived essentially as protective works on the basis of increased production; and (e) the lack of co-ordination between different State agencies involved in agricultural development of the command areas.

Based on case studies of three selected irrigation projects, V. K. Sharma and A. N. Sharma bring out the sensitivity of the benefits in terms of net area irrigated and returns per unit water to the timing and quantum of irrigation (which they call 'irrigation decision rules'), crop patterns and rainfall patterns in the command area. They rightly emphasize that the estimation of returns "on the basis of one particular year's survey, as is usually done, does not take into account weather uncertainties" and that it is necessary to consider the expected value of returns rather than simple returns based on time-series data. They point out, again rightly, that whether or not to evaluate a project on the basis of optimum crop patterns cannot be decided independently of whether or not the conditions required to enforce them will in fact be met. Also well taken is their observation that the distribution of water is not uniform to all sizes of farms, which fact is hardly ever taken into account in project appraisal. Finally, they explicitly recognize the problems of valuation, especially of costs, in a situation where prices and time schedules of construction change in the course of implementation. All these points are so pertinent and important that one wishes the authors had dealt with them in greater detail.

Ravindra H. Dholakia and Sudarshan Iyengar have critically reviewed the planning and appraisal of minor irrigation projects in Panchmahals district, Gujarat. Based on a study of 28 minor irrigation tanks reported to be completed between 1970 and 1977 [some of which were undertaken as part of the normal programmes and others under the Drought Prone Area Programme (DPAP)], the study describes, briefly, the manner in which projects are identified and subsequently processed for clearance. The procedure, though apparently elaborate at least in the sense of submitting each proposal to scrutiny at several levels, does not, however, ensure that the projects are properly prepared or evaluated. Failure to provide for the development of area to be benefited by the tanks (land levelling, consolidation, drainage, and distribution network) and the lack of co-ordinated effort on the part of concerned technical departments to help farmers realise the potential are cited as major weaknesses. Moreover, out of the 28 projects studied, there

was no irrigation at all in the areas covered by 10, all of them being works executed under the DPAP.. Altogether, only 8 per cent of the area estimated to be potentially irrigable by the DPAP schemes is in fact irrigated. In the remaining projects, the ratio is only 25 per cent. Interestingly, the utilization is quite close to estimates for *rabi*; practically the entire gap is in the *kharif* season. The authors make no comment on this significant fact! Benefit-cost ratios (even of the crude variety as illustrated in Appendix I of the paper) were not calculated in respect of 12 projects. They draw pointed attention to some major defects in the appraisal procedure, and the information base on which it rests. These defects, which incidentally are typical of most irrigation projects, deserve special attention. So do their comments on the kinds of reactions which the beneficiaries have to the project.

Vishwa Nath's paper on formulation and appraisal of rural electrification projects gives a description of the manner in which they are formulated and highlights its weaknesses. He draws pointed attention to the poor base of technical information on which the projects rest; the failure of the project authorities to follow well-defined criteria to determine where and on what scale electrification is to be taken up; and their tendency to rely uncritically on the flow of information from the State Electricity Board in making their decisions. However, the procedure would seem to provide at least some correctives at a subsequent stage when the project proposals are supposed to be scrutinised for techno-economic and financial viability by specialists drawn from various departments. The reader is left wondering whether these detailed appraisals succeed, to any significant extent, in remedying the deficiencies listed above; if not, why not? Nor does the paper say precisely what kind of selection criteria are applied in approving projects. Are any projects rejected as a result of detailed appraisal? Or do the project estimates simply get recast to pass the tests?

D. P. Apte's discussion of the formulation of the Small Farmers' Development Agency (SFDA) programmes again focuses on the weaknesses in the bureaucratic machinery. Though on paper a machinery exists to bring together the concerned departments and non-official agencies in formulating the programme, and also elaborate guidelines are supplied for preparation and implementation of schemes, they do not work in practice. The multiplicity of agencies involved, the excessive burdens placed on the co-ordinating officers (who have to deal with several other programmes besides SFDA), the lack of any systematic assessment of 'felt needs' of the intended beneficiaries or of the technical possibilities are cited as contributing factors. Why is it that the importance attached to SFDA in official pronouncements gets so diluted at the operational level? Is it because the scale of expenditure on the SFDA is small in relation to the other programmes? What is the relation of the SFDA schemes to those of other programmes? Since the components of the former, in a functional sense, overlap with those of the latter to a considerable degree, is it better to use a system of earmarking a certain proportion of overall development funds exclusively for small or marginal farmers, rather than having a nominally separate programme for the latter? Why

is it that the potential beneficiaries do not exert effective pressure to make the programme more effective? Who are the non-official representatives on the governing body of the SFDA and what role do they play?

Kannan's study of Kuttanad project experience is a rich illustration of the wide ramifications of an agricultural development project. It highlights the dangers of taking a narrow concept of costs and benefits of a project which interferes with a complex ecological system and generates considerable adverse consequences of the people of the region. The need to take a broad view of costs and benefits, involving a careful assessment of the 'externalities' is underscored by this analysis. More importantly, it provides some insights into the manner in which various local interests interact on the conception and implementation of the project as well as on how they shift in the face of experience.

### III

#### CASE STUDIES IN PROJECT EVALUATION

The papers in this category, which form the largest group, are a very mixed bag in terms of the types of projects studied, the perspective from which the evaluation is done, and the quality of analysis. The majority deal with irrigation projects; there is one paper each on forestry and tree crops. A few evaluate costs and benefits generally using *ex post* data. In general, the technical quality of analysis leaves much to be desired. With some exceptions, the papers take a rather narrow and restricted view of project costs and benefits. They present only analysis of (not always properly done) financial returns and hardly anyone goes into the question of social cost-benefit analysis. The problems involved in the determination of efficiency prices or shadow prices for evaluation of the project from the social viewpoint are not discussed. Also missing is a critical discussion of the quality of estimates of costs and benefits, the manner in which the required information is obtained, the extent of systematic biases in such estimates, and the reasons therefor.

#### *Studies of Irrigation Projects*

Most of the papers of this group are in the nature of *ex post* evaluations. S. S. Pal *et al.*, comparing the relative costs and benefits of shallow and deep tubewells (STW and DTW) based on a sample survey of farms served by these two sources, find that though the capital cost of STW per hectare is higher, they are superior in terms of additional output and employment generated, as well as of benefit-cost ratio, internal rate of return or net present value. The analysis seems to be wholly in terms of market prices without any connection to reflect social as distinct from private valuation. It is suggested in passing that the relatively poor returns to DTWs may be due to the deterioration in management but no evidence is cited to support the proposition. Is it a matter of deterioration or is it due to the greater difficulties (mostly institutional) of ensuring efficient use of water from these wells (which are



generally publicly owned) compared to the STWs (which as a rule are small enough to be owned and operated by individual farmers)? It is also suggested that the gestation period of the DTW may be a major factor: Again, there is no supporting evidence, much less a discussion of sources of delays. Finally, Table VI suggests that the increase in cropping intensity in STW areas is much larger than in DTW, essentially because the unirrigated cropping intensities in the former are much lower to begin with: This may mean that the soil, rainfall-water table conditions in the areas served by these two categories of project are different, in which case attributing superior programme of STW wholly to the source of water is questionable. Finally, the author does not indicate whether the project areas are served only by the tubewells or whether they benefit from other irrigation sources as well.

The appraisal of the impact of the Command Area Development scheme (under the Ramganga Irrigation Project) by R. I. Singh *et al.* is flawed on several counts: To attribute changes in the cropping intensity, crop pattern and yields within a space of three years to the command area programme alone is questionable because of the difficulties of isolating changes due to such factors as weather and prices from those due to the project. Moreover, the project itself started only in 1973, was still in the process of implementation and at the very least one must be sure that the data on benefits relate to the part of the command area where the project had been implemented. And the incremental gross output per rupee of annual cost on other farm development work is hardly a satisfactory measure of the economic returns to the project.

The appraisal of the effects of the tubewells by M. P. Azad *et al.* is even less satisfactory. Though the results of the survey of 30 farms before and after introduction of tubewells is interesting, they raise several questions: Did these farms have access to any other irrigation source before the installation of tubewell? Were any other sources added after the installation of tubewell? Do all farms surveyed make use of the tubewell or combination of different sources to the same degree? The returns to irrigation are computed solely in terms of increased output and net incomes: Are costs and benefits evaluated at comparable prices? Clearly, if they are at current prices, the returns are likely to be exaggerated. In any case, this way of measuring returns to investment is open to serious question.

Ashok K. Mitra and S. W. Muranjan have analysed the financial and economic returns to a lift irrigation project. Their framework of evaluation is again much too narrow: they consider only the returns to the project authority. In their 'economic' analysis the social cost of electrification is equated to the costs incurred by the State Electricity Board in the generation, transmission and distribution of power, without any discussion of how these costs are determined. The social benefits, on the other hand, are defined in terms of the cost of the most economic alternative sources of energy for the purpose on hand. Is it the assumption that all alternatives produce the same benefit streams? If so, they could have as well directly computed the social cost-benefit ratio, internal rate of return, etc., for each alternative and rank



them on that basis. What exactly is being done by their procedure, and how it is done, remains quite opaque. There is the further problem that since different techniques use different sets of inputs with varying scarcity values for the economy, the use of market prices for evaluation is highly questionable. And finally, do figures in Table II relate to the cost of supplying the same amount of water with the same seasonal distribution by different techniques? What about the extra investment and operation costs of the *mhot* technique in deeper wells?

J. S. Sisodia's paper on Chambal is again mostly a straightforward narration of the differences in cropping intensity, crop patterns and yields between command and non-command areas. The 'cost-benefit ratios' are computed on the basis of annual benefits to annual costs without any discounting or allowances for difference between private and social values. One interesting finding of the survey is that the output in the non-command area is much more variable than any farms benefiting from the project. Can this be taken as an index of the greater assurance of output as a result of irrigation? If so, should this not be counted as a benefit? and how? The author unfortunately does not address himself to these questions.

The papers by K. C. Dhawan and A. S. Kahlon, and Baldev Singh fall in a somewhat different category. Both these papers deal with irrigation, but are concerned with working out, in a linear programming framework, the optimum resource use, and the costs and returns associated with it, as a result of the introduction of irrigation. Dhawan and Kahlon are concerned with comparing the returns to tubewell water for small farmers with and without purchase/sale of water. Their formulation raises several questions: Does the model explicitly take into account the situation of the farmer in respect of water supply prior to the introduction of the tubewell? How small is a small farm? Is a 5 HP engine too large to be utilized fully on own farm? Unless this is true (or alternatively, it is demonstrated that there are strong decreasing returns to use of water over the relevant range), sale of water as an option does not seem to make much sense. Why are the returns under optimal plan with a small tubewell greater than that obtained by purchasing water? Is it because there is not enough water to buy? Or because the cost of purchased water is much higher than it could be if the farmer were to have his own tubewell, even if it were under-utilized? If the latter were the case, the appraisal should allow for the fact that the own tubewell option involves a sizeable initial capital outlay. This aspect cannot be captured without some form of discounting of time flows of costs and returns which seems precluded by the model.

Baldev Singh's programming model for Surendranagar district gives some very odd results indeed! He finds that (a) as the percentage of irrigation increases, the rate of income rise falls; in fact non-farm employment and income fall in absolute terms; (b) the incremental output due to irrigation is inversely related to farm size. These are certainly novel and quite contrary to commonsense expectations. One would have expected the author to explore whether these are simply the result of the way he has speci-

fied the underlying relations (which we have no way judging from the paper) or whether they have a 'rational' explanation. Again, if (b) is true, would it not be desirable to reserve all the water for the small farmers in order to maximize regional income which is the criterion function of the model? The author mentions the importance of the protective role of irrigation, but has hardly anything to say about how this benefit is captured in the optimization exercise. Indeed, as V. N. Saksena points out, any model which simply compares average outputs before and after irrigation without taking into account the frequency and amplitude of year-to-year fluctuations cannot fully capture this effect. This is a major defect of most evaluations of irrigation projects.

The importance of risks and uncertainty in agricultural projects is stressed by Saksena whose paper is devoted to outlining a method for Statistical Risk Analysis (SRA). He suggests, as a first step, sensitivity analyses based on 'most optimistic' and 'most pessimistic' estimates of inputs and outputs to get an idea of the variables to which the rates of returns are particularly sensitive. This, together with information on the extent of inter-correlations between variables, helps to reduce the number of variables to be considered for SRA. The range of values for each selected variable is given probability ratings and the probability distribution of returns is then obtained by simulation. This method, as the author recognizes, is more demanding in terms of the range of variables to be included and requires a great deal of informed judgement. Though the latter may seem subjective, it is not any more so than in the usual methods of appraisal. On the other hand, it has the distinct advantage of focusing on the critical variables and forcing project authorities to articulate their judgement in respect of each.

### *Forestry Projects*

A. C. Sharma and B. R. Garg have attempted to appraise the financial and economic viability of forestry projects. As an exercise in project appraisal the paper by Sharma and Garg leaves much to be desired. Though they attempt an economic appraisal, they do not really come to grips with the problems of social valuation. Some of the important aspects which could have been discussed are as follows: First, the question of externalities. The paper lists several beneficial effects of forestry projects besides the production of timber, *e.g.*, increasing life of reservoir, reduction of flood, improvement of groundwater recharge, and saving of cowdung which has a good alternate use as manures. It would have been interesting and useful if the authors had examined the problems of quantifying these effects (including any additional costs which their realisation might involve) and of incorporating them in project appraisal. But it does not go beyond an undifferentiated listing of the 'external' effects. Second, even in respect of the direct benefits, namely the yield of timber, the authors could have critically evaluated the basis of the yield estimates and the conditions under which the assumed yields will in fact be realised. If the yield estimates are based on experimental

plots of the Forest Department; the feasibility of achieving similar standards of management under conditions of large scale plantation need to be taken into consideration. And, in so far as the rate of plantation and the quality of management are a function of the willingness of the private landowners to co-operate by giving away their land and to submit to the regulations necessary for optimum production, judgements about these factors also become relevant. This is particularly important for farm forestry projects where the choice of species, lay out of trees, fencing and control of biotic activity by individual farmers are said to be critical. Third, the above considerations argue for a more systematic analysis of the effect of risks and uncertainty in yield on the economics of the project. The question is whether sensitivity analysis of the type done by the authors is really adequate. For one thing, are the values of costs and returns assumed in the sensitivity analysis sufficiently large to capture the probable range? Would it not be better to identify the critical factors affecting costs, returns and their time profiles and get an informed judgement of the contingent probabilities of the expected values being realised? This would also have the advantage of focusing on the policy and management conditions required for project effectiveness.

R. Umakesan and V. Rajagopalan address themselves to evaluation of investment in tree crops. They are concerned with determining the optimum area and age of replanting coffee on the basis of sample survey data for 247 farms in South India. The criterion for optimization is the maintenance of maximum steady output stream. Apart from the fact that the evaluation is from the viewpoint of the planter and not of society, their analysis is flawed because they do not take into account (a) the age composition of the existing stock of coffee plants; (b) the possibilities of increasing yield of the existing stock by better management; and (c) the possible effects of major new technical developments like, *e.g.*, the introduction of superior varieties. In a real world all these are variables.

M. von Oppen has attempted to evolve a method for quantifying the effects of improvements in marketing institutions on productivity. Unfortunately, the copy which came to the Rapporteur had only the first 10 pages and it is therefore not possible to offer comments. S. S. Acharya and N. L. Agarwal's evaluation of regulated markets is much too narrow in scope (being concerned only with the finances of the marketing boards rather than with their impact on prices received by farmers and hence on productivity). Chetty's study of the National Seeds Corporation highlights the differences between target and performance, but could have analysed the reasons for the divergence in greater depth.

#### IV

##### EX POST EVALUATION

*Ex post* evaluation consists in (a) comparing of the actual with expected results in terms of costs, returns and their time profiles; and (b) an objective analysis of the factors responsible for the deviation between the two. Its

purpose is to help the project planners and the executive authorities to incorporate the lessons of experience to improve their performance. The papers in this category deal with projects of a wide diversity covering irrigation, marketing, extension, small farmers programme and rural public works. Although of varying quality, and although most of the papers go far enough in providing a clear analysis of the reasons for deviation from project proposals, they raise many interesting and relevant questions.

The papers by A. S. Charan, and Y. S. Chauhan *et al.* report, without comment or criticism, the results of surveys relating in one case to the situation of sample farms before and after the completion of an irrigation project in Gujarat and in another to a sample of farms with and without irrigation in an area served by a lift irrigation project in Uttar Pradesh. The papers by Sinha, Sharma and Sharma, and Dholakia and Iyengar though in the nature of *ex post* evaluations, were discussed in section II because they raise questions directly relevant to project formulation and appraisal.

Jagannathrao R. Pawar *et al.* are concerned with the reasons for the shortfall in the utilization of irrigation potential created by the Ghod Project in Maharashtra. This paper shows that the overall shortfall in the irrigated area is mostly in *kharif*, and only marginal in *rabi*. On the other hand, the summer irrigation is nearly 80 per cent more than planned. The actual output in the project area is also less than projected. The reasons for this divergence are, however, not explained: Of course, the mere fact that the area under summer crops was much more than planned would itself reduce the area irrigated by the given amount of water because crop water requirements during summer are much higher. But this does not explain why the crop pattern turned out to be different. It is perfectly possible that the planned crop pattern was not carefully worked out to begin with even in the sense of matching the seasonal pattern of water supply (from rainfall and irrigation) with the requirement of the proposed crop pattern. The project's assumptions about water requirements and conveyance losses may have been wrong. Or it may be that the project authorities could not effectively enforce, either because the instruments were not clearly worked out or because they were not implemented, the planned crop pattern. As for the shortfall in outputs, one must know more about the basis for the original estimates (including the assumption about the rate of adoption of other improvements facilitated by irrigation and the consequent rise in yields) before any conclusions can be drawn. Finally, the use of a single year's figures of actual use can be misleading to the extent the crop pattern, etc., in that year are affected by rainfall conditions and price expectations prevailing at a particular point of time.

Two papers deal with the effectiveness of dairying which is one of the components of the SFDA programme. J. B. Salunkhe and S. B. Singh show that the project reviewed by them has made a statistically significant difference to average productivity per animal and to the net income of the beneficiary farmers, and that the beneficiaries not only produce more milk but also market a large proportion of their output. However, it would seem from Table

2 that the proportion of beneficiaries is relatively higher among the larger farm sizes. The author does not indicate what the average size of farms of the sample is, and how it compares with the overall average for the village.

A. G. Prasad's paper, dealing with a tribal area in Andhra, is more of an evaluation in that it explicitly compares the actual performance with project estimates and finds that the former is invariably less favourable, by all measures, than the latter. They point to the decision to bow to local prejudice against Murrah buffaloes, the low level of concentrates fed to the animals, and weaknesses in marketing as the principal reasons. However, they have nothing to say on whether or not the local prejudice against Murrah buffaloes was well founded. The finding that the farmers choose to sell half their output to private traders even where the State collection system was good and despite higher prices offered by the latter deserves a fuller explanation than is offered in the paper.

N. V. Namboodiri's study of the Pilot Intensive Rural Employment Projects (PIREP) finds that though the idea was to invest in works which would generate continuing employment after construction, in actual fact the bulk of the resources were used for 'infrastructure' especially roads; and in most blocks the programme failed to generate the desired level of employment. A more detailed study of one block in Kerala confirmed the superiority of minor irrigation as a more effective way of creating employment per rupee spent, and also that the actual employment created was less than estimated. He cites defects in the implementation machinery as a major factor, but does not go into the reasons for them. Nor does he discuss the relation of the PIREP to the rural development programmes, the relative priorities attached to the other two in actual implementation and resources devoted, or the extent to which this may have affected the results.

The evaluation of fruit marketing projects by C. S. Raghubanshi *et al.* is concerned primarily with the expected and actual financial performance of the project authority. Though they mentioned a number of economic benefits (*e.g.*, higher production, better prices, lower cost of marketing and smaller storage losses), none of these aspects is examined.

The evaluation of extension services by V. S. Satyapriya and the study of farm management training programmes by Radhey Syam *et al.* are interesting because they deal with projects which are particularly difficult to evaluate. Satyapriya's paper raises several questions: What effect did the place of residence of the extension agent have on the distribution and frequency of demonstrations between blocks? Is there any significant relation between the number and/or frequency of demonstrations and the rate at which the technique/varieties demonstrated were in fact adopted in the area? Does the cropwise distribution of demonstrations bear any relation to the relative importance of different crops in other regions? Is the proportion of area under HYV a sufficient measure of impact? What about other inputs? Was there any calculated strategy in deciding the crops and blockwise distribution of demonstrations? How successful have the demonstrations been in dis-

seminating knowledge of new techniques? What are farmers' reactions? If they have not adopted, or adopted fully, are there other constraints? What are they?

The study of Radhey Syam *et al.* shows significant changes in the crop pattern, input use and techniques of trainees after completing the course. But can these be attributed wholly to training? Was the programme's objective only to train particular farmers or was it conceived as an instrument for intensive training of a small group who in turn would act as agents for wider dissemination? If the latter, how successful has the project been?

## V

### SOME GENERAL ISSUES

Having commented on the content and analysis of individual authors, it seems useful to focus on some of the general issues relating to formulation, appraisal and evaluation of agricultural projects in order to provide a framework for discussion at the Conference. In formulating the issues we have drawn upon not only the papers presented to the Conference, but also a much larger body of literature on the subject.

#### *Project Formulation*

It is apparent that formulation of agricultural projects suffer from several serious deficiencies. These include inadequacy of basic surveys, major changes in project scope and design after approval; incomplete coverage in the sense that all the ingredients which determine the eventual outcome of the project are not included in the project proposal; the general failure to explicitly evaluate alternative location, designs and use of resources generated by the project before its design is finalised; and the failure to view individual projects in the wider sub-sectoral/regional perspective, keeping in view the needs and possibilities of each sub-sector/region, the constraint of resource availability and the relative priorities attached by the Government to different social objectives.

The obvious question for consideration is why, after nearly three decades of planning, the concerned agencies of the State and Central Governments failed to build up organizations and procedures for eliminating these defects which everyone recognizes to be widespread? Among the possible explanations are: The rapid turnover in the leadership of the bureaucracy and at the political level generally tends to reduce the time horizons of decision-makers. The persistence of a bureaucratic set-up in which the general purpose civil servant holds sway over professionals and specialists has not been conducive to building organizations in which the latter would inevitably play a prominent role. Integrated planning of related activities and programmes, which is particularly important in agriculture, is also the more difficult to achieve because of (a) the fragmentation of planning and decision-making for this sector at the ministerial and civil service levels, and (b) the inherently difficult, and sensitive questions of institutional reform which they involve. There



is also the tendency for political power centres to view and demonstrate their performance in terms of the number of projects they are instrumental in getting approved and started irrespective of whether the projects are sound and irrespective of the number which can be efficiently implemented within the given overall resource constraints. It would be worthwhile discussing the relative importance of these and other factors in relation to the formulation of agricultural projects of different categories and in different areas.

### *Project Appraisal*

At the conceptual level, despite considerable advances in evaluation techniques, the prevailing practices remain crude and highly heterogeneous. There is hardly any systematic institutionalised procedure for *ex ante* project evaluation with proper consideration of alternatives; and estimates of cost and benefits are hardly subject to critical scrutiny on well-defined objective criteria. The Group might focus its attention on (i) the conceptual and estimational problems; and (ii) on the procedures for project appraisal.

On the former, one major question is the scope of benefits and costs to be included in appraising particular projects. Typically, an agricultural project contributes both directly and indirectly to increasing production: For instance, an irrigation or soil conservation project directly increases output without any major changes in other inputs by raising yields of particular crops, by enabling a shift to high value crops and by reducing the fluctuations in output. But they might also enable the farmers to increase yield by enabling larger amounts of other inputs, especially fertilizers, to be applied profitably. Also externalities are frequently a significant phenomenon in agricultural projects. While, typically, indirect benefits are counted in project appraisal (but not externalities), the conditions under which (and the speed with which) they will be realised, and the extra costs involved in realising them, are generally not taken into account. This requires in the first place that the project appraisers take into consideration ingredients (by way of complementary investment and inputs, institutional services as well as changes in organization) which, though beyond the scope of the project as proposed, are nevertheless critical for reaping the expected benefits. Secondly, a much more critical scrutiny of the technical basis for design, the cost estimates and time profiles of implementation is essential. Thirdly, it is to be considered whether the risks and uncertainties inherent in agricultural projects can be adequately taken care of by the usual kind of sensitivity analysis or whether a more refined probabilistic analysis would be superior. Fourth, the distributional consequences of the project, and the assumption underlying the project estimates in this regard merit much closer scrutiny. Finally, the whole question of the data base for benefit estimates need review: Uncritical and arbitrary use of experimental station data is clearly unwarranted. On the other hand, any attempt at realistic estimation raises questions regarding the farmers' response in terms of the speed and efficiency with which the potential created by the project will be exploited. Much greater use of systematic studies of



'with' and 'without' situations in comparable areas where similar projects have operated is one solution. But even here adjustment will have to be made for possible improvements suggested by experience.

At the same time, improvements in procedure cannot be divorced from the institutional setting in which they operate. It is worth considering why even where, as in large irrigation projects and rural electrification, some systematic evaluation is attempted, the results are not satisfactory. Also, since it is in the nature of agricultural projects that the bulk of them have to be formulated and appraised at the district or block levels, it may be necessary to devise simplified procedures and criteria and prescribe institutional arrangements for implementing them.

#### *Ex Post Evaluation*

One of the most effective ways, in principle, of institutionalising a mechanism for identifying lacunae and correcting them is *ex post* evaluation of projects. While both the Centre and most States have set up programme evaluation organizations, their impact seems to be negligible. It is because (a) the resources devoted to their activity are inadequate, the evaluation studies are not planned properly; the results are available with inordinate delay, and do not provide concrete, operationally meaningful recommendations? Or is it due to a general reluctance on the part of the executive authorities (at the political level and in the bureaucracy) to face criticisms of their performance which in turn makes them take an attitude of calculated neglect and worse, of programme evaluation? For it could be argued with much force that if the top policy-makers were really serious about learning from experience, they would welcome, and actually encourage, objective evaluations by giving it prestige and resources. Is it possible to use the mechanisms of the Public Account and Estimates Committees for bringing out the failure of past projects and necessary corrective measures more forcefully to public attention? To what extent can more active participation of independent academic economists, sociologists, and management specialists help this process?

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