EX-POST EVALUATION OF AGRICULTURAL PROJECTS: ITS IMPLICATION FOR PLANNING

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The methodological problems that arise in ex-post evaluation of agricultural projects are identified. The issues are illustrated by evaluation experience of a groundwater irrigation project in Jordan. The paper considers the implications of this analysis and experience for project appraisal. And in the light of this, the authors are critical of sophisticated appraisal methods, for several reasons, and urge a more simple approach to planning.

Five years ago, because of the dearth of ex-post evaluations, it was difficult to comment in precise terms on project performance. Although hundreds of projects were initiated annually in the 1960s, each project was planned with only limited reference to previous experience. Since 1970, a large number of field evaluations have been completed.* However, the formal record of project experience is still inadequate. In part, this is because the methodology for evaluation needs improving but also because there remain a number of unresolved problem areas. This paper discusses the methodological issues, it reviews recent evaluation studies, in particular one conducted by the authors in Jordan, and it considers the implications of this experience for the theory and practice of project appraisal.

The project cycle, indicated by heavy arrows in Figure 1, is a sequential process which operates on the ratchet principle, that is, it is irreversible. Each phase is dependent upon the outcome of the previous activity. For example, successful project design and appraisal is dependent upon the identification of appropriate projects. However, project identification often fails to consider sufficient alternative options in terms of scale, timing, technology, location, organisation and related criteria. Moreover, recorded experience from the ex-post evaluation of ongoing projects is commonly not available to guide selection among options at the identification and project design stage. There are thus two purposes of ex-post project evaluation:

(i) to provide feedback to the project itself. This enables an assessment of project performance to be made – has it been a success or not? The criteria for this judgement are the comparison between initial objectives, predicted performance and actual achievement of objectives and performance,

(ii) to provide feedback to the planning process. This comes from the lessons gained from project experience and comparison of project achievements and the goals of current policy.

The Wadi Dhuleil case

Our evaluation experience includes the study of a groundwater irrigation project

Figure 1 Schematic representation of planning activities

Neglected activities

Main sequence in Project Cycle
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in Jordan.* The following is a brief summary of the proposed project, its actual realisation and the conclusions of our evaluation.

The proposed project was to be a government controlled, smallholding settlement of over 3,000 dunums (300 hectares). This involved the expropriation of original Bedouin landowners within the project area, sub-division of the area into 20 dunum (2 hectare) holdings and allocation of these holdings to selected settlers. The recommended farming system, which was rather complex and diversified, included pure stand vegetable production, leguminous fodder, livestock and a perennial tree crop. The pumping of irrigation water was to be controlled from a central power station using diesel engines and submersible electric pumps in each well. It was predicted that an average benefit cost ratio of nearly 3:1 at 10 per cent and I.R.R. of 15 per cent would accrue to this project. Its political objective was to settle nomadic Bedouin.

Settlement and agricultural production began in 1970 and by 1974 the project comprised 6,250 dunums (625 hectares) which was divided up into 233 farm holdings. The actual form of organisation differed markedly from that proposed, for the project was laid out in units of varying sizes which were handed over, together with titles of ownership, to the original land owners. The Bedouin landowners were recent nomads who had no experience of irrigated agriculture. In order, therefore, to exploit their newly acquired asset they proceeded to settle around the scheme and to rent their farms, on a cash or share tenancy basis, to non-Bedouin farmers (Palestinian refugees) who had experience in irrigated agriculture. Instead of a government controlled settlement, therefore, a private landlord/tenant system emerged. The prevailing cropping system is based solely on vegetable production, the main crops being tomatoes, cucumbers and cauliflower which are mainly intercropped.

Although there were delays in the construction of the project, the settlement process was carried through reasonably quickly. However, the agro-economic performance of the project exceeded that predicted by the original appraisal report. In 1973/74, the year of evaluation, vegetable yields were twice those predicted and net returns to farmers were 20 per cent higher. At this level, the internal rate of return to investment exceeded the predicted level being roughly in excess of 20 per cent. It is our opinion that this favourable performance owes much to the introduction of a landlord/tenant system of tenure rather than the proposed government controlled settlement design. In this region skilled irrigation farmers are available, but they have no claim to land, hence the landlord/tenant system is feasible.

What is more remarkable is that the agro-economic achievements of the project were achieved in spite of serious power and water supply deficiencies. From the start of the project, there was recurring trouble with the power source punctuated by intermittent failure and culminating, in 1974, in the complete breakdown of the power station. At the time of evaluation, emergency well-head engines were in operation. The reasons for the power problems were numerous but the main one undoubtedly arose from inadequate maintenance of diesel engines and pumps.

The water supply problem is of even greater concern and relates to the imbalance between the extraction rate from the aquifer and its rate of recharge. The cause of this imbalance is due to recent irrigation developments in the area undertaken by several, large scale, private farmers who draw their water supplies from the

* Wadi Dhuleil, Jordan - an ex-post evaluation. Occasional paper No. 1. Agrarian Development Unit, Wye College, University of London, 1974. This was commissioned by Ministry of Overseas Development which also financed the appraisal and implementation of the project.
same aquifer. These developments have taken place in spite of the prohibition imposed by government on the drilling of additional wells in the Dhuleil area. It has led to a fall in the water table, water shortages on the project and some land, on the periphery of the aquifer, going out of production. The water problem is of greatest concern because if withdrawals from the aquifer remain uncontrolled, the survival of the project itself will be in doubt, particularly as the private irrigation developments are more favourably placed on the aquifer and will be the last to be affected by water shortages.

As a result of the Wadi Dhuleil project and some small adjacent irrigation development, there has arisen a thriving community of about 5,000 people in what was, ten years ago, uninhabited desert. If private large farm developments are allowed to proceed unchecked, not only is the survival of the project itself in jeopardy but so also is this thriving community which has grown up around it.

The following is a very brief summary of the major recommendations of the evaluation study:

*Organisation.* The original proposal of controlled Bedouin settlement has been introduced onto other irrigation schemes in Jordan. These have involved a lengthy and costly training programme and have not produced a very impressive level of productivity. Given the very satisfactory level of economic performance at Dhuleil, it must be judged that the private enterprise, landlord/tenant system evolved there is a superior way of achieving prosperous Bedouin settlement and effective exploitation of land and water resources.

*Agro/economics.* Dhuleil is unusual in achieving a fairly rapid rate of development and a level of agro/economic performance substantially exceeding that predicted. However, there is doubt about the long term viability of the present farming system. Continuous vegetable cropping is a system clearly susceptible to pest and disease attack and to soil depletion. Given the one-year leasing system, however, it is a rational decision from the tenant farmers' point of view. To encourage resting of the land and growing a wider range of crops in a sound rotation (as originally proposed), it is recommended that leasing arrangements should be extended to a three- or five-year period. On the financial side, current water rates cover less than one-third of operation and maintenance costs. Since farm incomes on the project are high, by Jordanian standards, it appears reasonable that landowners should cover the full costs of operation and maintenance and it is, therefore, recommended that water rates be doubled. This would reduce farm incomes by about 14 per cent from the current levels, slightly more if the cropping pattern changes are adopted.

*Power and Pumping.* The original design of a central powerhouse generating electricity to drive submersible pumps was technically quite satisfactory. However, in the context of the very poor standards of maintenance available on the project, it proved to be an oversophisticated design. A simpler system using well-head diesel engines and shaft-driven pumps might well have been more appropriate to the circumstances.

*Water.* In order to safeguard the future of the project and the thriving community dependent on it, it is essential to ensure that withdrawals do not exceed the maximum safe yield. To achieve this, it is essential to introduce a coherent, enforceable regional water plan which rigidly controls the drilling of new wells and monitors the pumping and control of abstractions. The general lesson from the Dhuleil experience, with regard to water supplies, is that groundwater is a common property resource which requires public regulation for its optimum economic and social exploitation. Individual projects, covering only part of the aquifer, cannot be successfully planned or operated if there is unrestricted access to the scarce vital input of the system.
Conclusions. Judged against original objectives, the evaluation clearly establishes the project as a success. The political objective is being achieved, and the agro/economic achievements exceed those predicted. To maintain this level of performance, however, requires effective action on the agronomic, power and water aspects of the project.*

As feedback to the planning process, the evaluation (judged against current objectives) has delineated an alternative model for Bedouin settlement. It has shown the need to design power systems which accord more closely with Jordanian conditions; to make provision for viable farming systems by incentive and advice to farmers; and, above all, to assure total control of the aquifer on which a project may be sited. Lastly, the employment and income distribution impact of the Project has shown it to be a desirable form of water exploitation.

Methodological issues of evaluation

Ex-post evaluation should be a systematic review procedure. There is the danger of an evaluation study being a vague, historical or descriptive treatise, of little value for prescription and containing few concrete lessons. A major methodological issue inhibiting a systemic approach relates to choice of criteria or tests of preferredness. Obvious criteria will be of a technical, economic and financial nature but other goals may be set concerned with employment, regional impact, nutrition and self-sufficiency which will also require tests of achievement. A decade ago, economic efficiency was regarded as a valid proxy measure for social welfare goals. Its main defect arose from the need to give a premium to savings and a higher priority to individuals, groups or regions bypassed by the economic growth process. This has led to the advocacy of more complex procedures for assessing the impact of alternative projects upon inter-temporal and inter-personal welfare. Criteria set in relation to various goals are not inherently equal. Whilst technical feasibility may be considered a necessary condition for development, overriding all other criteria, varying standards of technical performance above some minimum level may be optimal. Evaluation studies should examine several aspects of technical performance. The relative weight given in evaluation to technical, economic, financial, legal, administrative and other aspects of project performance in order to establish the degree of success cannot be predetermined, although they are weighted implicitly or explicitly in the design and appraisal stages.

Nevertheless, a selection procedure that relies upon multiple criteria, set separately or jointly, will require some form of weighting system. For example, it may be necessary to assess whether a target economic rate of return is equivalent to a given level of job creation. This clearly gives rise to conceptual problems, one of which is that there are likely to be varying levels of interdependence between criteria. For example, employment creation and financial returns may move in opposite directions; increased income and improved nutrition levels may move together. A practical problem which arises here is the difficulty of deciding whose responsibility it is to determine criteria weights. Obtaining objectively, verifiable measures for each criterion presents further problems. Where economic goals are treated narrowly, at a high level of aggregation, and relate to patterns of intertemporal consumption (Little and Mirrlees, 1974) or patterns of inter-temporal and interpersonal consumption (Squire and Van der Tak, 1975), a major problem is that of finding a meaningful numeraire or common yardstick

* The O.D.M. responded rapidly to the evaluation report by requesting the Institute of Geological Sciences to undertake further exploration of the Dhuleil aquifer (two reports have resulted to date) and by placing an order for flowmeters needed to monitor abstractions from the aquifer.
and of establishing the trade-offs between the various forms of consumption which are considered to contribute to the overall goal.

Where a unitary measure of value is not sought but options are considered by reference to a set of partial criteria relating to objectives such as 'nutrition', 'regional development' or 'income redistribution' -- there are still problems of determining measurable variables which can form the basis for a criterion. Such items as nutrition status cannot be represented by any obvious measurable variable and, therefore, only indirect approaches are possible. The selected basis for ranking should preferably be a cardinal rather than an ordinal form, but judgements will still be required on what constitutes acceptable standards. For reasons outlined later, we consider that it is more useful, to establish feedback for testing performance, if evaluation is carried out using various partial criteria.

In tackling some of these issues, the United States Agency for International Development (U.S.A.I.D., 1973) has evolved a 'logical framework' of project evaluation which suggests that the analysis of project performance should follow a vertical progression:

- If adequate inputs are provided, then planned outputs will be produced.
- If these outputs are produced then purposes will be achieved.
- If purpose is achieved, then a planned degree of progress toward a higher goal will occur.'

Each term italicised will require an objectively verifiable indicator. In the case of Wadi Dhuleil this is fairly simple for inputs (i.e. generating sets, tubewells, water distribution channels and so forth). Outputs include agricultural and horticultural produce but intermediate outputs such as water delivered or fields ploughed could be included. The project goals include the efficient use of agricultural resources, settlement of migratory farmers, provision of fresh fruit and vegetables from domestic production. The broad, ultimate objectives are difficult to establish but could well be to give the Bedouin access to modern medicine and education, to reward them with irrigated land for past loyalty to the King, to provide income opportunities and useful employment to a group of rural inhabitants. The settlement of non-Bedouin (Palestinian) refugees was not a project purpose but an unexpected outcome. So too was the creation of a thriving small township of several thousand people, who were attracted to the area because of water availability, employment opportunities and so on. It will be seen that measuring a contribution to project goals is extremely difficult. Sound judgement is likely to be the only way to measure the degree of attainment.

Achievement of the various targets for input delivery, outputs, purposes and goals is dependent upon certain sets of assumptions being valid. In agriculture, substantiating the data base, coping with inherent technical, economic and social uncertainty and assessing the likely impact of the large number of other uncontrollable exogenous factors, makes the process of establishing valid assumptions extremely problematical. In view of this we see the U.S.A.I.D. procedure more as a useful conceptual aid than an operational procedure in agriculture.*

Studies of irrigated agriculture systems by Otten and Reutlinger (1969), Duane and Lal (1972) and others indicate the following evaluation check list of testable hypotheses:

(i) construction costs and duration underestimated;
(ii) uptake of irrigation slower than forecast;

* If this procedure has in fact been used by U.S.A.I.D. to evaluate capital projects, a great service would be performed by publishing the indicators used together with the performance levels actually achieved.
(iii) economic rates of return usually lower than forecast;
(iv) financial rates of return very much lower because pricing policies are
deficient or not enforced;
(v) electric power requirements often exceed demand (hydro-power or
thermal power for tubewells);
(vi) designs are overly sophisticated;
(vii) however, poor operation and maintenance is more of a problem than
poor design;
(viii) exogenous factors likely to have a major impact (e.g. civil wars, inclement
weather, externally generated inflation, etc.);
(ix) rehabilitation, modernisation and improvement is likely to be more cost
effective than new projects.

In the Wadi Dhuleil case, hypotheses (i), (iv), (vi), (vii), (viii) and (ix) were
supported. Hypothesis (v) was irrelevant and (ii), (iii) were refuted because of
the ready uptake by experienced irrigation farmers.

In our experience, three simple tests proposed by O.E.C.D. (1975) are a
sufficient guide to ensure fairly rigorous evaluation. These tests are:

(i) were the means selected effective (a technical test);
(ii) were the least-cost means adopted for each component implying
efficiency;
(iii) was the overall outcome a significant contribution to social and economic
goals.

These relatively simple criteria were used to guide the Wadi Dhuleil investigations.
In this case, the project components were generally found to be effective but in
many instances, particularly on the engineering side, the means were not efficient.
Nevertheless, the outcome was a significant contribution to social and economic
goals and more effective than alternative agricultural development strategies
employed elsewhere in Jordan.

Practical problems of evaluation
There are several reasons for the widespread disregard of ex-post evaluations
by planning agencies. First, aid donors and recipient governments generally do
not have a basic desire to reveal the truth regarding past project investments.*
The coincidence of interest between donor and recipient is to focus on ex-ante
modelling appraisal activities, which can always be presented in a favourable
light. This is particularly true in the very difficult agricultural sector. Operating
agencies have objections to detailed evaluation for similar reasons. Revealed
defects in operating performance will not enable the authorities to escape their
responsibility. Thus, while appraisal is an exercise of imagination (or crystal
gazing), evaluation can be a real finger-pointing exercise.

A further impediment to the greater use of evaluation relates to manpower
and financial costs. Whilst these costs are much less than those for design and
appraisal, they are likely to be quite significant — perhaps one per cent of capital
cost for a comprehensive review. The proper allocation of these costs is also a
difficulty. If the benefits are feedback to the operating project and to new projects
perhaps the costs should be split. In practice, the incidence of benefit is impossible
to establish and there is a strong case for the costs to be regarded as a general
planning overhead.

* The fact that the Ministry of Overseas Development has been spending about £100,000 a
year on evaluation might appear to contravert this contention. However, this sum is
trivial in relation to the annual capital aid figure.
The case for evaluation is easier to establish than the proper means to carry it out. There are advantages and problems associated with independent and 'in-house' evaluations. The latter has some obvious limitations and we consider it should be reserved for regular performance reporting only. Such information will of course greatly reduce the cost of subsequent detailed evaluation. However, critical evaluation or spot checks are best carried out by outside agencies such as universities, aid agencies, individual consultants or consultant firms. An interdisciplinary team has obvious advantages. In the case of the Wadi Dhuleil study, the team comprised the authors of this paper, one of whom was part of the original design team. The third member was a Jordanian national and recent graduate of Wye. It was probably a desirable mix. The team was from an overseas university and this gave it independence. The team member who had assisted in the original planning (a decade previously) was able to provide insight into the motives for various design decisions which proved to be very valuable. The Jordanian had local knowledge, spoke the language and, not being a government employee, he was able to resist pressure to paint a glowing picture.

The team was in the field for 14 man-weeks and spent a slightly shorter period on analysis and writing up. This is a relatively short period and, therefore, the team was liable to suffer from what Chambers (1974) terms rural development tourism. However, it maintained a high degree of scepticism, made informal visits to the project and carefully cross-checked information. Nevertheless, the dangers of casual empiricism are real in ex-post evaluation studies.

Implications for project appraisal
The literature of project planning has been dominated, in recent years, by research and operational manuals dealing with appraisal techniques. In the works of Little and Mirrlees† (1974), U.N.I.D.O. (1972) and Squire and Van der Takt† (1975), for example, the focus has been on devising methods for achieving objectives such as growth and equity within a context of diverging private and social net returns. Whereas, the aim of ex-post evaluation has been to assess achievement of detailed goals through which project objectives can be achieved. Experience with evaluation has led us to the view that the considerable resources required for the L-M type of appraisal, because of their high opportunity costs, are misdirected. We argue, therefore, that if planning efforts are redirected towards effecting improvements in more critical areas of agricultural project planning (such as indicated in the Figure), considerable improvement in project performance will result.

The works cited above, particularly those of Little and Mirrlees, have evoked considerable criticism on theoretical and operational grounds and because of objections which stem from the special characteristics of agricultural production. This is not the place to enumerate the theoretical objections levelled against the L-M school; but it should be said that some critics have called into question the whole conceptual basis of the L-M structure. Kornai (1976), for example, rejects entirely the neoclassical framework on which it is based. He considers that the L-M school builds up a shadow world (a consequence of shadow pricing) identical with the Walrasian ideal and it expects decision-makers to act as if this world was real. Others have pointed out that the partial budgeting nature of

* This is characterised by an urban and tarmac bias, 'the garland syndrome', reinforced selective perception following repeated visits by different researchers/officials to the same 'typical' farmers, confusion and lies, and ignorance of many important activities which are hidden from casual visitors.
† Referred to in the text as L-M and SVT. For a review of SVT, see Carruthers (1977) J. agric. Econ., 28, 86–89.
‡ For this see Stewart and Streeten (1972).
§ It is understood that this challenging paper by Professor Kornai, read to an F.A.O. seminar in Rome, is likely to be published in a forthcoming festschrift in honour of Tibor Scitovsky.
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appraisal abstracts from the overall economy, except for the linkage effected by shadow prices; that its central notion of a social welfare function is too simple* or even that it does not exist in any meaningful way.†

Then there are those critics who accept the theoretical framework of the L-M school, but who have serious reservations on particular aspects of it, e.g. Mishan (1971), Stewart and Streeten (1972) and Joshi (1972). Weckstein (1972) rejects all shadow pricing procedures as harmful because socially profitable projects, which are unprofitable at market prices, will require subsidies and these, in turn, will have a distributional impact. To assess this impact would put an even greater strain upon scarce planning resources.

The operational objections to the L-M school are not less serious. For example, the LDCs do not have sufficient trained staff to appraise, according to L-M procedures, all proposed projects. But unless all projects are so appraised, there will arise the problem of uneven treatment of projects and the consequent problem of interpretation and of establishing priorities. This will present insuperable problems of ranking and selection. Where a social welfare function or unitary index approach is used, there are serious problems of deriving weights for the various components. In this case who is to decide upon the weights? The politicians, the planners or the aid donors? Our experience of evaluation and project planning, in a number of developing countries, suggests that agreed information on relatively simple issues, such as discount rate policy or minimum living standards, is extremely difficult to obtain from planning agencies. Where weighting is employed, planners may attempt to derive weights for conflicting objectives by observing the actual choices of ministers. Such ex-post evaluation of weights might well be irrelevant to contemporary goals because of shifting priorities. It is likely to reveal firstly, a divergence between declared objectives, for example those set out in the national plan, and actual strategies pursued and secondly, the ad hoc, unstable nature of project goal selection. Alternatively, if weights are specified by planners themselves and projects appraised according to L-M or similar procedures, then planners may become latter-day court wizards, usurping the decision-making authority of their political masters.

In attempting to evaluate an on-going project, we found considerable difficulty in establishing precise public objectives. Ministers and senior civil servants were not inclined to be explicit about project objectives, mainly because of their politically sensitive nature. For instance, we gained the impression that not all officially stated objectives were privately subscribed to by decision-makers. These specification problems commonly arise when attempting to determine the weighting of objectives at the appraisal stage and this must limit the operational value of current appraisal procedures.

Appraisal methods, such as those of L-M and SVT, impress many non-specialist planners with a false sense of precision. The project plan consists of many components in an interdependent system. There is considerable uncertainty about each element particularly in an agricultural project. Irrespective of the theoretical deficiencies of appraisal, project performance will be critically affected by the accuracy of forecast demands, prices, costs, returns, management systems, rate of development and so on. These factors are an integral part of a project plan. However, ex-post evaluation experience reveals that forecasting with precision the outcome of agricultural projects is rarely achieved. It is not completely cynical to say that elaborate and superficially impressive appraisal

* See Rimmer (1973).
† Because of the diversity of interests within the developing society, the rapid changing of the mix of official objectives and the common propensity of governments to ignore declared objectives.
techniques present an aura of spurious accuracy which imbues decision-makers with a false sense of confidence when selecting projects. Moreover, the laborious process of shadow pricing, according to the manuals, absorbs an undue amount of skilled effort while ex-post evaluation reveals that the factors which determine project success or failure are not primarily related to these aspects of planning.

Cairncross (1976) expresses scepticism about the use of shadow pricing in the light of the numerous non-economic reasons for government action. He doubts whether procedures using elaborate methods have greater merit than simpler and more approximate methods; he also doubts the significance of shadow rates for most calculations. We concur with this view and also consider it reinforced when the special characteristics of the agricultural sector are taken into account.

Agricultural production in LDCs is mainly undertaken by vast numbers of small peasant farmers and it is the characteristics of peasant agriculture which greatly affect the validity of the L-M type appraisal. Small farmers are beset by the risks and uncertainties of weather (drought, flood, frost, wind), pests, diseases, input supplies and markets. The consequence of these are fluctuations in yields, supplies and prices which make it impossible to establish reliable functional relationships between agricultural inputs and outputs. These uncertainties, moreover, produce constraints which severely affect farmer behaviour and response. For example, fluctuating supplies and prices produce a situation of acute credit scarcity which inhibits farmer acceptance of change and innovation and this frequently slows down the expected rate of project development. Indeed, the variance of expected outcomes and farmer behaviour is the major source of inaccurate prediction (together with poor data) which, in our opinion, limits the relevance of the L-M approach in the appraisal of agricultural projects. This leads us to the opinion that resources employed in developing appraisal methods would be more productively employed in providing better information on project planning and performance.*

Implications for irrigation

In the operation phase of irrigation projects, the shortfall of financial forecasts is often more serious than would appear from an economic viewpoint. Operating agencies may rely directly upon revenue to carry out the proper staffing, maintenance and replacement schedules necessary for efficient project performance. Where revenue is allocated on the Treasury system, the effect is indirect but, in practice, Treasury attitudes to recurrent allocations are often conditioned by revenue performance. It is anticipated that as the emphasis on project selection shifts to low income farmers, the pressure on the recurrent budget will grow and so will the need for accurate financial forecasts at the planning stage. The problems associated with setting and enforcing irrigation tariffs will have to be solved if operating performance is to be improved.

The basic thesis of this paper is that planning efforts should be redirected from the oversophisticated appraisal of projects to technical and financial aspects of agricultural planning.† Of course, this does not apply to all aspects of planning since some components of irrigation planning procedures are already over-elaborate. The estimation of crop water requirements, for example, could be much

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* In a discussion of his paper, the authors put this point to Professor Ian Little. He replied that he did not accept this criticism when applied to industry - which is scarcely an answer to the point made. See Little, I.M.D. (1971).

† Because we consider that the divergence of predicted and actual project outcomes (for reasons given in the text) are more serious (for project appraisal and performance) than divergence of actual and social prices.
more approximate because it is based on very uncertain data. Thus, crop mixes may vary because of product price shifts, the cost of inputs may change; new varieties may be developed and actual irrigation efficiency is likely to differ from that assumed and also to vary over the year and between years (hopefully improving with time); leaching requirements will vary over time as drainage is developed and drainage water is mixed with irrigation water, sometimes from projects upstream; farmers may cultivate a smaller area than predicted or, if water and not land is limiting, farmers may spread the water over a larger crop area. In view of these and other factors, a much more approximate cropping pattern design, using a 'model' crop mix and basic climatic data, would suffice.

A decision matrix approach

In project selection, economic objectives are only one of several criteria for choice. Indeed, the SVT approach deals with several aspects of economic welfare simultaneously, including the distribution of project income between consumption and investment and between 'rich' and 'poor', using 'social' prices. But it does not cover all the relevant criteria and, given the present scarce planning capacity of most agricultural agencies together with the lack of formal economic training of many decision-makers, it cannot be considered satisfactory. If, therefore, the meaning and workings of the selection methods are not evident to the decision-makers this must reduce their merit. For this reason, a simple decision matrix approach is likely to be preferable for agricultural planning. (See Table 1.)

It is contended that the non-economic specialist, by scanning this matrix, could consider simultaneously a wide range of relevant issues and thus make better selection decisions than with the L-M or SVT procedures. The first economic criterion would require consideration of the more important elements of social cost benefit analysis. Transfer payments, sunk costs and double counting of benefits have to be avoided, discounting (at 10-15 per cent) and some simplified form of shadow pricing adopted. The simple pragmatic approach, with prices adjusted in the right direction to the approximate order of magnitude, appears to us to be correct. A shadow exchange rate, where possible, supplied by the Treasury; use of world market prices for inputs and outputs; a shadow wage rate half way between the marginal product wage of labour in agriculture and the money would suffice. This approach would release planning resources to concentrate upon technical and economic issues, such as forecasting with and without the project, future levels of physical production, quality of produce, interseasonal and intraseasonal fluctuation in supplies, market structure, effect of differential inflation on factor costs, management systems, farmer response, financial forecasts and revenue policy and other items which appear ex-post to be the most important and neglected aspects of agricultural projects.

In conclusion we would say that ex-post evaluation is a difficult but important area of agricultural project planning which requires additional research into methodology and empirical problems. It is important that all empirical evaluation studies are published, so that agricultural development hypotheses can be tested against actual outcomes. Only in this way can the poor predictive power of agricultural development planning be improved. We consider that the World Bank is correct in asserting that there is inadequate information concerning the ways in which rural development can be accelerated (I.B.R.D., 1975) and correct in advocating high priority to research and information gathering. Our experience and analysis suggests that a cost effective way of obtaining resources to satisfy this need is to adopt less complex planning procedures and divert resources from elaborate project appraisal activities to those which will improve the predictive efficiency of agricultural planning and project performance.
Table 1  Illustrative layout of economic decision matrix

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<th>CRITERIA²</th>
<th>FINANCIAL INTERNAL RATE OF RETURN³</th>
<th>PROJECT ALTERNATIVES¹</th>
<th>ECONOMIC INTERNAL RATE OF RETURN³</th>
<th>TO FARMERS</th>
<th>TO GOVERNMENT</th>
<th>JOBS CREATED/ $1,000 INVESTMENT</th>
<th>PROPORTION OF PROJECT INCOME TO POOREST 20% OF POPULATION %</th>
<th>LOCATION IN PRIORITY DEVELOPMENT AREA (YES OR NO)</th>
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¹ These could be projects of different scale, timing, location or projects of a different nature. However, the validity of comparisons is lessened if very unlike projects are compared, e.g. an irrigation project and a hospital.

² These criteria are examples only. Specific criteria would be set according to (i) objectives of policy, (ii) constraints existing in the economy and (iii) the time to full development.

³ Risk is more important in agriculture, therefore the plan should include a risk assessment, the forecast range and frequency distribution of rates of return.
References


Résumé

L’ÉVALUATION RÉTROACTIVE DES PROJETS AGRICOLES – SON IMPLICATION POUR LA PLANIFICATION

Cet article cerne les problèmes méthodologiques qui surviennent dans l’évaluation rétroactive des projets agricoles. Les questions qui se posent sont illustrées par l’expérience faite dans l’évaluation d’un programme d’irrigation en Jordanie. L’article examine ensuite les implications de cette analyse et expérience pour l’appréciation des projets et, à la lumière de ce qui précède, les auteurs critiquent, pour plusieurs raisons, l’emploi des méthodes d’appréciation trop élaborées et recommandent instamment l’ adoption de théories beaucoup plus simples pour appréhender les problèmes de la planification.
Zusammenfassung

EX-POST EVALUIERUNG LANDWIRTSCHAFTLICHER PROJEKTE - IHRE AUSWIRKUNG AUF DIE PLANUNG

Die methodologischen Probleme, die sich aus der Evaluierung landwirtschaftlicher Projekte ergeben, werden bestimmt. Die Folgerungen werden anhand einer Evaluierungserfahrung, gewonnen an einem Grundwasser Bewässerungsprojektes im Jordan, illustriert. Der Artikel betrachtet die Implikationen dieser Analyse und Erfahrung für die Projektbewertung. Und in diesem Licht äußern sich die Autoren aus mehreren Gründen kritisch zu hochentwickelten Bewertungsmethoden und sie drängen auf einen einfachen Zugang zur Planung.