

Planning small-scale irrigation schemes

by Harry Underhill

The promoters of small-scale irrigation schemes need appropriate guidelines: ones which will take into account the differences between large and small schemes, but at the same time help the small schemes to be rigorous and scientific in their methods.

CRITICISM HAS sometimes been directed at informal irrigation on the grounds that it is ill-planned and therefore economically unviable, gives disappointing results, or is a downright failure. When discussing the role of NGOs in promoting informal irrigation one senior government adviser told me, 'Tell them to keep right out of it! They only get into trouble and then run to us to help them out!' And he gave examples of small schemes aiming to assist drought victims which were started by philanthropic bodies with little or no technical advice, so the soils had become saline, or the water supply had failed, or the schemes were abandoned by the people because they proved unworkable, or the benefits were too small.

What this planner did not appreciate is that it is not the small size of a scheme or the informal approach that is the cause of such failures. The basic factors influencing the success or failure of a scheme (social and economic factors, technology level, water resources, land suitability, etc.) are the same for large or small schemes; and large formal schemes can fail for exactly the same reasons as the small schemes this planner had known. What his experience was telling him was, rather, that the promoters of small schemes were less professional in their planning because, unlike most of the agencies which promote large formal schemes, they did not have a tradition of rigorous scientific approaches to the complex interaction of factors which must be understood when developing irrigation, whether on a large or small scale. The answer to his criticism is not, therefore, to discourage the small-scale approach, but to provide its promoters with appropriate guidelines for development, and to train them to use these guidelines.

The conclusion that the basic factors are essentially the same for small/informal and large/formal schemes, and that therefore similar studies are needed in the planning stage, needs one qualification. While

it is true that factors such as soil type or water supply need to be studied in either case, the precision of the study from a scientific point of view can be less rigorous for the informal approach. There are three reasons for this. The first is that local knowledge can play a greater role, since the beneficiaries usually already know their local conditions (physical resources, infrastructure, or socio-economics) better than outside experts. Secondly a step-by-step approach is usually needed, with each step small enough to be within the vision and near-experience of the people who are indeed the ones who are taking the risk. And thirdly, as an extension of the second point, the step-by-step or modular approach is more flexible than the fully planned large scheme, and if problems do appear the plans could be changed sooner, and if losses do occur they should be much smaller in magnitude.

Guidelines needed

This being said, it is none the less quite clear that the need for the sound technical preparation of projects, however small or informal, remains. For large formal schemes there is a considerable body of accumulated experience to draw on, encapsulated in many manuals and guidelines, although even in this field of high input/high output investments, the goals, value systems, techniques, and methodologies change and develop with time, so that new guidelines replace the old.

The recognition of the informal sector in irrigation is recent, and there has been no demand as yet for planning guidelines at this level, though there has been an increased interest in simple or appropriate technologies. Now, however, there is a need for an authentic methodology in project preparations for informal as well as for formal development, though aimed at different audiences — the formal guidelines for national governments and official investment agencies, and the informal guidelines for local government and non-governmental bodies (see Table 1).

Guidelines for formal development exist already, for example those published by FAO (1983), the World Bank, and other bodies. Guidelines of a 'semi-formal' nature are now begin-



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Mark Edwards/Still Pictures

Table 1.

Size or scale	Agency/Organization	Type of guidelines		
		Formal	Semi-formal	Informal
Large	Official development agencies:			
	International	X		
	Bilateral	X	X	
	Central governments	X	X	
Medium	Local government bodies		X	X
	NGOs:			
	International		X	X
	Local			X
Small	Farmers' groups or rural community organizations			X

ning to appear in print, for example the 1986 MALD report, while guidelines for the 'informal' approach are not yet available in any generally accepted form. 'Semi-formal' refers to small irrigation projects which are supported by governments through their irrigation services but not controlled or operated by them. Government assistance can be critical at the level of works which the farmers cannot do for themselves (for example permanent headworks, land levelling), in technical advice, and in providing a favourable 'policy environment', for example price control at a stable and attractive level, market systems, credit, and extension.

The project cycle

When considering guidelines for the preparation of projects, the concept of the Project Cycle is useful. This term is used to denote the sequence of steps that many years of experience of the planning and execution of formal

development projects has found to be desirable. Short cuts can, of course, be taken to suit the circumstances, but essentially the project cycle contains the following steps:

1. Reconnaissance
2. Preliminary or pre-feasibility study
3. Feasibility study plus appraisal
4. Final design and implementation

Between each of these studies or events, an intermediate decision-making step is needed. Based on the previous step and taking into account the influences of external circumstances, a decision is made as to whether to proceed further or not.

The third of these intermediate steps, between steps 3 and 4, is the most crucial and is generally called the project 'appraisal'. It is at this point that the funding agency decides whether or not to accept the proposal for investment and allocate funds.

Based on a hundred years' experience of modern large-scale irrigation development, both the meaning and content of each step in the project cycle

are well established. The project elements cover the physical resources (climate, land, and water), the social resources (labour and skills), and the economic resources (inputs, infrastructure, access, markets). At each step the information previously gathered is reviewed and carried a step further to a more detailed level. The purpose is to ensure that major problems are foreseen, that as little as possible is left to chance, and that the final design is the one best-suited to the conditions and objectives.

Less formal guidelines

A useful analysis of the project cycle for small-scale informal irrigation has recently been prepared by the Ministry of Agriculture and Livestock Development (MALD) in Kenya on the basis of several years' experience of this type of work.* The project cycle is presented in four stages as follows:

1. Field visit to gather information
Output: Field Visit report
Time taken: typically 5 to 10 days
2. Analyse existing data; collect new data, preliminary designs, and cost estimates
Output: Preliminary report
Time taken: typically 1 to 4 weeks
3. Detailed investigations and design
Output: Final scheme document, including detailed designs and costings
Time taken: typically 2 to 6 months
4. Implementation

(*Another very useful check-list or 'Guide for Rapid Appraisal' by Robert Yoder and Ed Martin was published at about the same time. Although developed in Nepal, this Guide has already been successfully used in Africa.)

To help during Stage 1 the MALD document contains a useful check list on which the field visit report is based. The main headings in the check list are:

- physical resources: rainfall, water source, irrigable areas, soils topography, population, and farming systems;
- objectives;
- degree and nature of farmers' participation;
- constraints expected;
- alternative development activities; and
- analysis of the existing scheme if the project is for rehabilitation.

These factors are basically the same as for the formal approach to irrigation development already noted.

If Stage 1 shows that the irrigation potential is attractive, then Stage 2, the



The purpose of carrying out detailed investigations is to ensure that the final design is the one best suited to the conditions and objectives.

pre-feasibility or preliminary study, will commence. This requires the analysis of the data gained in Stage 1 together with new data, preliminary designs, and cost estimates; it concludes with a 'preliminary report indicating restrictions, possibilities, and recommendations to be used for the selection of schemes which will be investigated in more detail' in Stage 3.

Stage 3 is not covered in the MALD document, but (as with the formal approach to project preparation) it will refine the data for the scheme so that a final decision may be made about whether to proceed to implementation. It is at this point in the semi-formal approach that it is becoming common for an agreement or 'memorandum of understanding' to be drawn up setting out the responsibilities of the concerned parties — for example the local farmers' association, the local irrigation unit of the central government, and the NGO supporting the enterprise.

Comparison of formal and informal approaches

It is in the section on Stage 2 in the MALD manual that the difference between the formal and informal approaches to project preparation become clear. In the formal approach, the decisions are made by politicians and civil servants, taking into account the project reports available to them, but also influenced by national and international strategies and power structures. These high-level and often abstract concepts are of little direct interest to the farmers, whose concerns are more concrete and more immediate — such as food for the family, cash for clothes and school fees, or social status in the community. This contrast between abstract and concrete is, moreover, reinforced by personal immediacy. To the national planners and politicians the success or failure of an irrigation project is likely to be at some remove from their personal lifestyles; although it may, conceivably, influence their future careers, their immediate circumstances of health, family, and property are unlikely to be affected. Even the lower-level technicians are likely to receive the same salaries after as before the scheme. In contrast it is the peasant farmers, with a more precarious economic base to their existence and living nearer the realities of 'basic needs', who are asked to take the risks, usually without being an opportunity to evaluate these risks beforehand.

In the formal approach, this may be no great obstacle, as the farmers' opinions were not considered to be of primary concern, and decision-making could proceed as fast as the decision-makers could smooth out possible conflicts and reach agreement.

With the informal approach, however, new questions arise: do the farmers understand what is involved with acceptance of the proposal to which they will contribute the major part? And are they able to operate it after completion? The farmers may be taking a big step into the unknown. This may require not only time for the unknown to be weighed up and assessed, but also training in the practicalities of what it will demand. In fact some NGOs have found that training in other, but related, fields, for example bookkeeping for treasurers, is as essential a core feature of any grassroots irrigation development as field water management or pump maintenance courses for farmers.

The conclusion is that if it is the people who are to make the major investment in the scheme and who have the decision-making power, then the time spent between the study and reporting steps of project preparation may be quite unpredictable and may be much longer than expected at first sight. In one actual case the farmers twice failed to reach agreement on an irrigation scheme proposal; but the advising agency allowed the processes of discussion, learning, and training to continue at its own speed until the third time, when the farmers were convinced, and united to proceed with the scheme. ●

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