

SOCIAL AND INSTITUTIONAL ASPECTS OF IRRIGATION MANAGEMENT

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The very existence of the International Irrigation Management Institute reflects a shift in the agenda of irrigation management issues over recent years. Originally set by irrigation engineers, the old agenda comprised three main sets of perceived problems: inadequate financial resources for O&M, perverse and destructive behavior on the part of farmers, and the need for discipline and political enforcement. Over the past decade, a new agenda has emerged which includes an interest in the social, institutional, and political factors that give rise to poor water management.

The management of irrigation systems appears to follow a "natural evolution." In the early stages, land and water are relatively abundant, while both labor and experience in irrigation management are scarce. As experience with irrigation accumulates and water becomes more scarce relative to land and labor, greater attention is paid to its distribution and use.

A sense of the historical trajectory is important in developing irrigation management practices in order to avoid promoting practices which are inappropriate for a particular situation. Certain general pressures operate gradually over time to produce management practices which become progressively more sensitive to farmers' irrigation requirements. These pressures include: 1) time and accumulation of experience by farmers and irrigation officials, 2) increases in population densities and changes in labor markets, 3) changes in the preferred cropping pattern, and 4) diminishing opportunities for irrigating new areas.

The process of irrigation evolution is characterized by stages of management: Stage 1 - an orientation to the capture and release of water; Stage 2 - a concern with equity of water access by all farmers within the command area; Stage 3 - an effort to fine-tune water distribution to respond to varying topography, soils, and seasonal fluctuations; Stage 4 - an attempt to meet the demands of individuals or groups of farmers for given quantities and timings of water. Cross-cutting this natural sequence of irrigation management are exogenous factors including new agricultural technology, and in particular tubewells and low-lift pumps, budgetary constraints for new projects, or the national economic climate.

Other factors which influence the evolutionary sequence of irrigation systems are: 1) administrative traditions (e.g., the British administrative style is centralized, hierarchical, and rule-bound); 2) the nature of the water sources (e.g., farmers in small diversion systems of Indonesia manage higher levels of the system than do farmers in a huge system such as the Indus Basin in Pakistan); and 3) the politics of bureaucratic change (e.g., irrigation agencies tend to resist change and some are more successful than others).

The core of present problems with irrigation management lies in "pork barrel" projects put in place either because politicians want them, because irrigation agencies have a vested interest in expansion, or because various interest groups stand to benefit from construction contracts. Those nominally intended to benefit - the farmers - have no incentive to press for "economic" decision-making in construction, and no means of enforcing efficiency in the use of the facility after construction.

The recent Philippine experience indicates that drastic change in the attitudes of both irrigation officials and farmers can be effected by introducing policies which directly expose the actors to the material consequences of the investment decisions and management performance. The policy decision that NIA will have to fund most of its operating and maintenance costs, and to repay foreign loans through irrigation fee collection, appears to have brought about a remarkable change in engineers' attitudes. They have been handing over their more costly-to-run small schemes to farmers, as well as sections of large national schemes. The introduction of "mutual financial responsibility" between irrigation agencies and farmers is a promising strategy for improving institutional performance.

Some Important **Social** and Institutional Issues

1. Efficiency and public intervention **on small scale schemes**. Asian countries are likely to pay increasing attention to construction and rehabilitation of small systems. The physical potential for constructing new large-scale schemes is diminishing, while there is growing concern to develop new economic opportunities in marginal, hilly regions (e.g., NE Thailand) where large irrigation systems are not feasible. This shift of attention gives grounds **for** concern. Irrigation agencies are attempting to do things which they are unfit to do or which are simply unnecessary: pour concrete where it is not required; re-build or build farm ditches which farmers are able to do it more cost-effectively; and persuade, train or organize farmers to distribute water according to externally-imposed programs. Excessive intervention at its worst can create physical reconstruction which farmers do not want, and promote water user associations in place of, and sometimes covering different groupings of farmers than, previous community organizations; this may reduce farmers' commitment to self-help and actually reduce standards of **O&M**.

2. **System** rehabilitation. Most of **Asia** is rapidly shifting to a situation where major irrigation investments are in system rehabilitation rather than in new construction. Large-scale rehabilitation is often financed through foreign aid, and tends to be biased towards capital-intensive methods, towards rapid completion in a limited time scale, and towards periodic total rehabilitation rather than towards expanded continuous maintenance and upgrading which might be more efficient. Rehabilitation efforts generally give too little consideration to the changes in physical configuration made by farmers, or that could be suggested by farmers, based on their operating experience. Organizing farmers to participate in planning, financing, and monitoring is inadequately exploited. Other institutional aspects of rehabilitation include: (a) investment decisions and financing, (b) the influence of aid donors, (c) the degree of conservatism of irrigation agencies in organizational reform **as well as** new design and technology, (d) the **willingness**, or lack of it, on the part of irrigation officials to consult with farmers, (e) **job** incentives within irrigation agencies, and (f) the role of farmer groups.

3. Irrigation bureaucracies **and** irrigation **management**. The factors which explain variations in the performance of different bureaucracies in managing irrigation water are not **well** understood. Two methodological problems in grappling with this issue are: **a)** the lack of an operational definition of the concept of "efficiency in water management," and **b)** even if a relationship could be established between "efficiency" and the nature of management systems, the nature of the causality would not necessarily be demonstrated. Factors associated with the responsiveness of management systems are **likely** to include: a) the level of resources (staff, finances, influence) available to managers, **b)** quality and knowledge of staff, **c)** incentive structure, **d)** accountability of staff for system performance, **e)** status of irrigation management work within the irrigation agency, **f)** isolation of managers from political manipulation, **g)** corruption, and **h)** grievance procedures and information **channels** for farmers.

Some Unimportant **Social** and Institutional Issues

1. Coordination **of** irrigation **and** agricultural agencies. While coordination problems are intrinsic to bureaucracies, there are ways of ameliorating them. Other things being equal, coordination is easier between departments in the same ministry than between agencies under different ministries. There may **be** a good case for the creation of temporary super-ordinate authorities directing the activities **of** both agriculture and irrigation under certain conditions (e.g., Integrated Agricultural Development Programs in Malaysia, Command Area Development in India), but a wide range of factors will affect the wisdom and feasibility of such actions in each case. The decision to "coordinate" **will** have **spill-over** effects on other parts of the public service which **may** suffer from staff

defections to a more glamorous new department or authority. Improved "coordination" between **agriculture** and irrigation would almost certainly take **the** form of more sharing of responsibility for **irrigation O&M**, thus exacerbating the problem by diffusing responsibility.

2. Farmer organization. There are significant analytic and policy problems relating to farmer **organization**, but before considering them two distinctions must be made: a) Is the purpose of farmer **organization** oriented around O&M activities (water allocation, conflict resolution, system **maintenance**) or **new** investment decision-making (e.g., new construction and rehabilitation)? **On the whole, the** latter role is more promising, and when farmers act collectively to plan and construct irrigation channels they develop a sense of commitment to making good use of the completed facilities. b) **The** different kinds of situation in which farmers voluntarily cooperate to share water may range from **autonomous** organizations such as the Balinese *subak*, minimalist organizations where groups of farmers adhere to a set of rules such as the case of *warabandi* systems in India and Pakistan, and **situations** where allocation procedures are introduced and perhaps maintained through outside **intervention** (e.g., community organizers in the Philippines). There may also be ecological factors which **promote** certain kinds of Organizational solutions in different regions. Another set of issues **concerns** the relationship of farmer O&M groups to the irrigation bureaucracy on large-scale **schemes**. In cases where farmers have been exploited by irrigation officials in the past, government **efforts** to organize farmer participation may encounter resistance.

INSTITUTIONAL ISSUES DISCUSSION: A SUMMARY

In addition to the three formal papers presented in Thursday's session, Wade outlined a World Bank research project in which he is currently involved. The **study** seeks to explain O & M practices and **water** allocation rules in terms of several independent variables, including: 1) the scarcity value of water (a function of population density and water supply, as **well** as the performance of the national economy), 2) construction rates of new irrigation schemes, 3) opportunities for rainfed agricultural intensification, and 4) various other factors. National statistics from several Southeast Asian countries (including Taiwan, Thailand, and Indonesia) form the data **base** from which the developmental trajectory of the variables is being traced. A working hypothesis guiding the analysis is **that** a **more** or **less** "natural" trajectory exists in the intensification of irrigated agriculture when viewed from a national perspective.

The wide-ranging discussion sparked by the main presentations covered the topics of farmer organizations, the management of irrigation agencies, and research methodologies. One very basic question that arose was the benefits of farmer organizations. **Bottrall** pointed to the importance of **research** to determine, "what are the returns, in terms of costs and benefits, to organizing farmers in **different** ways or for different purposes and in different contexts?" Another set of questions is the factors determining the kinds of organizations that develop under different conditions. For example, Taiwan and the Philippines are often cited as having strong farmer organizations. Saldanha noted that "very little seems to have been written from the farmers' side. What are **the** cultural factors that have influenced farmers' reactions to government efforts to organize them?"

In order to understand the success or failure of farmer organizations, and their benefits, we need to **know** what functions they perform, or **have** the potential of performing. In many irrigation systems, **groups** of farmers are actively involved in augmenting the supply of water they would normally receive, as well as allocating that supply among themselves. Organizations originally formed around irrigation **can** also expand to other functions such as acquiring fertilizer or bank credit. Chambers focused attention on farmers' management roles above the outlet, either in formal groups (which is rare) or in informal understandings among farmers of different turnouts. He noted a paradox that "the better the operation of the main system, the less likely the farmers are to want to take part in

this type of operation." This point was underscored by Prakash. Farmers in small, flexible systems are more likely to organize themselves for irrigation management than in the case of large rigid systems (e.g., *warabandi*) where there are few management decisions for the farmers to make.

Moore suggested that "the greatest scope for involving farmers to improve irrigation lies in organizing farmers to make intelligent input into the rehabilitation process" where their experience with the existing system can be applied to the new design, and their labor can be recruited for construction. Moore also argued that research on the irrigation benefits and functions of farmer organizations is best conducted in systems that are undergoing rehabilitation.

The degree to which improvements in irrigation performance can be effected through improvements in the management of the irrigation agency itself drew a mixed chorus of comments from the participants. Lowdermilk stressed the importance of management functions within the agency as a neglected topic in the minds of donor agencies, whose focus is largely construction. Bottralt expressed concern, however, at the image of outside experts telling irrigation agencies how to manage themselves. IIMI might follow the example of schools of management, suggested Coward, and conduct long-term management studies in close collaboration with an irrigation agency, so that both the researchers and the managers would learn together. Another way of conducting a management study, proposed by Farooq Akbar, would be to focus on a specific irrigation function such as maintenance.

A great interest was expressed in Comparative studies of management, as well as alternative approaches. Merrey raised the issue of whether public agencies have the potential for managing irrigation effectively: "There are real limits to how well a public agency or irrigation department can manage an irrigation system because most bureaucracies are very sensitive to pressures from above, whereas their services are to the people below." Alternatives to public agencies are found in the irrigation districts of the western United States; some type of public company or irrigation cooperative might be another approach. Huppert advocated closely controlled comparative studies to evaluate different management approaches.

While many irrigation systems are undergoing rehabilitation, many others are not. Carruthers pointed to the practical need for improved management in systems which are physically deteriorating. A related issue is the shifting management responsibilities taking place in the Philippines, as the government unloads some of its systems into the hands of farmers. Is this a portent of things to come in other countries? Bangladesh is also experiencing the constraints of limited budgets, reported Bottrall, and is looking to collective management solutions.

The question of how to conduct research on the human and institutional issues was raised several times. The vague boundaries of the topic caused discomfort among the technical scientists. Walter asked for a definition of the "social irrigation system" (none was forthcoming) and asked how we can talk about social alternatives to an undefined system. The separation of social issues from the technical issues of irrigation is neither necessary nor desirable, suggested Small; rather, they can be integrated into such topics as main system management and rehabilitation. Several participants, notably Moore, viewed rehabilitation as an umbrella topic within which institutional issues could be addressed. Farmer organizations can also function as an important aspect of main system management, observed Wickham, and from an irrigation agency's perspective, it would be preferable to treat the two in an integrated fashion.