

INSTITUTIONAL DESIGN PRINCIPLES FOR ACCOUNTABILITY ON LARGE IRRIGATION SYSTEMS

Douglas J. Merrey

Two systems of management are distinguished—systems controlled and managed by local user organizations, and systems owned and controlled by government agencies. There is a consistent, but not perfect, relationship between governance arrangements and performance. Using a variety of measures of performance, a number of studies provide statistical evidence that the performance of self-governing systems is higher than that of government-managed systems. Other studies document improvements in performance of government systems through the creation of water users' associations (WUAs), although the sustainability of these improvements is often problematic. The sustainability of these improvements is often uncertain, primarily due to problems in accountability.

DESIGN PRINCIPLES FOR LOCAL IRRIGATION ORGANIZATIONS

There are a number of institutional characteristics which underlie the design of successful self-governing irrigation systems. The most salient are those which support a high level of accountability between leaders and irrigators:

A supportive policy, regulatory, and legal environment that recognizes the irrigation water rights of the community.

The capacity to mobilize adequate resources to meet the costs of operations and maintenance, emergency repairs, and modernization.

The benefits exceed the costs of participation, and those with larger benefits pay a larger share of the costs.

The organized control of water by users.

SHARED MANAGEMENT OF LARGE IRRIGATION SYSTEMS

WUAs are created—mostly at the tertiary level—to improve cooperation among farmers for local operations and management. The key to success however, is *accountability*. Both evidence and theory suggest that financially autonomous public irrigation agencies dependent on farmers paying fees for a substantial source of their funding tend to provide better services. In large public service agencies with many different stakeholders, accountability can be particularly difficult. Such agencies are usually structured hierarchically with primary accountability of officials upward to their supervisors and to the political level, rather than to the water users.

INSTITUTIONAL ARRANGEMENTS FOR LARGE-SCALE IRRIGATION SCHEMES

To varying degrees, an irrigation management agency may be either financially *independent* or financially *dependent* on outside sources for funding. In most dependent cases, it is the government which controls and allocates the level of resources to the agency. Financially independent agencies depend on users for most of their income. Management agencies may also have varying degrees of organizational autonomy, ranging from fully *autonomous*—when authority over decisions and activities is held by the user-members—to fully *dependent* if authority over decisions is held by the state. Similarly, an agency may manage a single irrigation system, or several systems.

Many irrigation performance indicators are described in the literature and several useful conceptual frameworks for assessing irrigation performance have been proposed. However, it is presently impossible

to apply universal performance indicators for comparative analysis of irrigation systems as there is no agreement among specialists on what such universal indicators might be. In addition, there is a dearth of available data on the performance of irrigation systems that can be used for comparative analyses. Consequently, the author seeks to show the plausibility of the proposed hypotheses, rather than to try to "prove" them in a scientific sense.

THE HYPOTHESES

A matrix (figure 1) relating autonomy-dependence with system type agency management highlights the characteristics of each hypothesis. Problems with data availability and performance assessment indicators notwithstanding, the results of the exploratory analysis suggest that the proposed hypotheses are plausible.

Hypothesis 1—Single Systems Managed by Autonomous Agencies

Single systems managed by autonomous agencies ought to exhibit the best performance, be the most adaptable as conditions change, and be the most sustainable.

This group includes all indigenous self-governing systems, many of which have high levels of performance and demonstrate their sustainability and adaptability by having survived and continuously adapted for hundreds of years. Included are cases of very large irrigation systems having substantially autonomous management organizations. The high performance irrigation associations of Taiwan, and the irrigation districts in Argentina, Colombia and USA have performance characteristics conforming to this hypothesis.

Hypothesis 2—Single Systems Managed by a Dependent Agency

Dependent agencies managing single systems will typically exhibit poor performance and adaptability to changing environments, resulting in questionable sustainability.

Single systems managed by a dependent agency are usually very large systems. Some are sufficiently independent physically that programs to shift them to the autonomous single system could lead to improved performance in the long term. Others are multiple use systems central to the prosperity of provinces or entire countries. There is considerable variation in the performance of these systems, and no single indicator is adequate for comparing them. Egypt, Haryana State in India, and the Indus system in Pakistan are three cases characterized by hierarchical management agencies in which decision making is centralized, and accountability is upward to senior civil servants and politicians, rather than to the users.

Hypotheses 3 and 4—Autonomous Agencies Managing Multiple Systems

Autonomous agencies managing many systems—Hypothesis 3—may try to be innovative and "customer-oriented" but dispersal of attention among a multiplicity of systems will limit accountability for particular systems and therefore, limit their performance. Sustainability and adaptability will vary among systems but will generally be lower than in Hypothesis 1. Agencies which are only partially autonomous—Hypothesis 4—will have only limited accountability to the users, which will limit their performance, adaptability and sustainability. Their performance and sustainability will be closer to those in Hypothesis 5 than to those in Hypothesis 1.

The only well-known case—although it does not fully meet the criteria—is the National Irrigation Administration (NIA) in the Philippines. NIA is only partially autonomous financially. It continues to receive various subsidies, and cannot set fee levels or enforce fee payments. As the charter of authority comes from the government and there is no user control, the NIA is dominated by its parent ministry.

Hypothesis 5—Dependent Agencies Managing Multiple Systems

Dependent agencies managing many systems will exhibit a wide range of performance levels, but with a preponderance of low levels, and low adaptability and sustainability.

A very large number of the systems in this category are performing poorly, and the responsible agencies have been only partially successful in implementing reforms. In an attempt to improve performance, Mexico is embarking on a reform program to turn over government-managed systems to autonomous organizations accountable to users. This entails moving system management into Hypothesis 1 and consequently, it is predicted that the program will lead to improved system performance. Based on the proposed hypotheses, it is suggested that countries like Indonesia, Nepal, Sri Lanka, and some Indian states should revisit and restructure part, or all, of their organizational models to confirm Hypothesis 1 if they wish to achieve sustainable high levels of performance.

CONCLUSIONS

The study findings uphold the supposition that single irrigation systems managed by system-specific organizations that are both financially and organizationally autonomous and accountable to their customers, generally perform better and are more sustainable over the long term. If the report is on the right track, the findings should be of significant interest to countries currently struggling to improve the performance and sustainability of government-managed gravity irrigation systems.

Figure 1. Matrix of irrigation system governance arrangements and performance hypotheses.

Number of systems agency manages	Relationship of Agency to Government	
	Autonomous	Dependent
Single irrigation system	<p>Hypothesis 1</p> <p>Achieve highest performance</p> <p>Most adaptive to changing conditions</p> <p>Most sustainable</p>	<p>Hypothesis 2</p> <p>Mixed but generally low performance</p> <p>Low adaptability</p> <p>Sustainability threatened</p>
Multiple irrigation systems	<p>Hypotheses 3 & 4</p> <p>Performance will vary among systems but overall will be lower than Hypothesis 1, higher than Hypothesis 5</p> <p>Adaptability and sustainability will vary among systems but overall will be lower than Hypothesis 1, higher than Hypothesis 5.</p>	<p>Hypothesis 5</p> <p>Wide range of, but generally low, performance</p> <p>Low adaptability and sustainability, with variation among systems based on local factors</p>