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# **Modernizing irrigated agriculture: capacity-building and institutional development**

**Tom Franks**

## ***Summary***

*The context for irrigation modernization in Syria reflects global drivers for change in irrigated agriculture. Two drivers are identified as being of particular importance, increasing stress on water resources, and the trend towards irrigation management transfer to the farmer level. Within these broad categories a number of specific challenges are likely to be of importance in the modernization process in Syria.*

*Capacity-building to meet these challenges is required at three levels, policy, institutions and the individual. This paper focuses on institutional development, as being the most difficult level at which to undertake effective capacity-building. It discusses the institutional framework for irrigation management and goes on to describe current approaches, based round the concept of design principles. Constraints and limitations of the design principles approach are discussed.*

*The paper concludes by proposing an agenda for preliminary action on capacity-building for irrigation modernization. This agenda comprises an institutional mapping exercise, an assessment of the roles and responsibilities of water sector entities, and the development of a strategy for supporting farmer-level institutions. Integration with other capacity-building initiatives (policy reform, human resource development) is necessary if it is to make an effective contribution to the overall modernization programme.*

## **The Context.**

Irrigated agriculture faces a number of challenges. These are shared across the world in a number of different forms and relate to natural and social resources in a variety of ways. The basic challenge is increasing demand for food production and food security, partly driven by rising expectations with regard to incomes and livelihoods. This demand for food (and fibre) must be met in the face of increasing demand for water from other sectors (domestic,

municipal and industrial) in a context of climate change and an emphasis on sustainability and environmental management. Changes in political and social structures also have an impact on irrigated agriculture, including trends towards decentralization, the increasing privatization of production and services, and the liberalization of international trade.

In different contexts the relative importance of these various challenges will differ. However, world-wide, increasing demand for water and changes in socio-economic conditions combine to produce pressure for far-reaching reforms, and these are often associated with fundamental changes to political, organisational and administrative structures in the realm of water governance. In the case of irrigation and other water services, significant changes in water availability or quality may need to be met by major technical or physical initiatives. Changes in water governance often result in some form of irrigation management transfer (IMT), with major changes in the legal and de facto responsibility for water management.

To meet the challenges facing irrigated agriculture, the Government of Syria is embarking on an irrigation modernization programme which in due course is expected to cover the entire irrigated area (1.4m ha) within the country. The programme is intended to address issues of water use and efficiency both in the distribution system and at field level. It seems likely that it will comprise a combination of hardware (better facilities for water allocation and distribution), and software (better methods for water management and application). Such initiatives need to be complemented by investments in people for improved water governance, through a process of capacity-building. This paper reflects on the needs and constraints of capacity-building for irrigation modernization in Syria.

### **Capacity building and irrigation modernization**

Significant work has been done in recent years on capacity-building in the irrigation and drainage sector, notably through the partnership between FAO, IPTRID and ICID's Working Group on Capacity-Building, Training and Education. This has culminated in a series of workshops over the past three years, whose outputs may be found in the published proceedings from these workshops (<http://www.wg-cbte.icidonline.org/>). In this part of my presentation, I build on these outputs to describe a theoretical framework for capacity-building and to highlight the key issues for building capacity for irrigation modernization.

### *What is capacity-building?*

A range of definitions of capacity-building are available. For our purposes we can say that:

‘the process by which individuals, groups, organisations and societies increase their abilities to perform core functions, solve problems, achieve objectives and to understand and deal with their development needs in a broad context and a sustainable manner’. (UNDP 1998)

Core capacities consist of defining and analysing the environment and overall system, identifying key issues and needs, and formulating and implementing strategies to respond to or meet these needs, all within an overall ability to acquire new knowledge and skills to meet evolving challenges.

Commonly, capacity-building is differentiated at three levels, at the level of the enabling environment, at the level of institutions and at the level of the individual (FAO, 2004). I shall discuss the first and third of these briefly, but focus my attention on the second, because it is likely to be the most problematic.

### *The enabling environment*

The enabling environment relates to the policy making processes of national government, which can facilitate, or indeed hinder, the development of institutions and individuals. Specifically it refers in this case to the formulation of appropriate policies to support the sustainable development of irrigation and drainage, and the implementation of these policies through legislation and regulation. Policy issues for irrigation modernization in Syria comprise policies which affect the ownership and management of water resources. Amongst these we can identify pricing policies for agricultural inputs and products (for example, fuel pricing policies will have a significant impact on groundwater pumping regimes) policies towards the exploitation of surface water resources, particularly in the light of changing transboundary flows, and policies concerning the balance of management rights and responsibilities between the state, individual farmers (and the private sector). Many other policies may also have indirect but important impact on the development of irrigated agriculture, and it is important to maintain a wide perspective on the role of policy processes and the linkage between them, and to recognize their inherently political nature.

### *Capacity-building at the individual level*

Many capacity-building initiatives are aimed at the individual level, through training programmes and other human resource development activities. Training of individuals undoubtedly has a role to play in increasing knowledge, improving individual competencies and in raising motivation and expectations in the appropriate circumstances. The ICID/IPTRID workshops referred to earlier heard many examples of successful training programmes, for example the training of Water Users Associations in Peru (Ledesma, 2004) and in Nicaragua (Jardinet, 2006). Nevertheless, questions are often raised about the effectiveness of training, based on doubts that the training can be effectively utilized because of constraints at the policy or institutional level. There has also been an increasing interest in alternative approaches to increasing individual competencies, for example through concepts of social learning which formed the focus of a topic session at the recent Fourth World Water Forum. Social learning refers to the process of context-relevant learning in partnership with others, and represents a departure from traditional approaches to training, based on the transfer of knowledge from expert to learner. IWMI have been active in aspects of social learning through their programme of Promoting Farmer Innovation in East Africa (Mati, 2006). Such approaches may well have merit in the Syrian context as a way of supporting farmers in the development of improved methods of water management. Building the competencies of individuals who are involved with irrigation other than as farmers (for example, gate operators, technicians, engineers and other professionals) is also important, and needs to form part of the overall programme.

### *Capacity building of organisations and institutions.*

My focus in this paper is on the middle level between policy and the individual, the development of organisations and institutions. These provide the structures and processes through which individuals utilise their competencies in achieving their objectives and goals. Without effective organisations and institutions even the most able individual will have difficulty in performing effectively, a fact that accounts for the disappointing outcomes of many training projects in the past. Whilst the terms organisation and institution are often used interchangeably, there are important differences between them and these differences must be kept in mind if we are to develop effective approaches to capacity-building. Organisations are generally characterised as groups or teams of individuals, such as football teams, or sometimes as a combination of groups of people and the physical infrastructure that they inhabit, such as courts of law. Institutions are generally considered to be the rules and norms

which govern how these organisations operate in practice, in this case the judicial code or the rules of football.

Many authors draw on these ideas to develop appropriate definitions and draw distinctions between the two concepts. For example, Svendsen in his recent book on river basin management, makes a distinction between organizations as ‘groups of individuals bound by a common purpose’ and institutions which he defines as ‘the humanly-derived constraints that shape interactions’. There remains, however, widespread and persistent confusion, as suggested by Goldsmith (1992):

‘Behind the confusion is the fact that the term institution has two principal meanings in social science. In management and organization theory an institution usually refers to a role or an organisation: in economics and sociology, an institution is a rule or a convention. There are major divergences between these two definitions... the first type of institution resides in deliberately-constructed human groupings, the second is diffused among a multitude of people. Roles have concrete reality, rules are mental conceptions’.

It seems helpful to maintain the distinction between organizations and groups (a collective of people with a common purpose) and norms and rules (the processes that shape human interactions and relationships) in thinking about capacity-building, whilst at the same time keeping in mind that the two are closely linked, and that no organization operates without the constant influence of rules and norms. These rules and norms may be formally defined or they may operate at various levels of the sub-conscious. Some may be newly established, others may have evolved over long periods of interaction. Whilst it is quite possible to design new organizations, or indeed to modify existing groups to undertake new roles, the establishment of the rules and norms which determine the operation of these organisations and groups is much more difficult.

### *Organisations in irrigation management*

In large-scale irrigation there is the additional complication that we need to consider two different sets of institutions (organizations, and the norms that go with them). One set of institutions is responsible for the overall allocation and distribution of water, whilst the second set comprises the users at local level, responsible for application and disposal. The two sets meet at the ‘interface’, where responsibility passes from one to another. Building institutions (organizations and norms) to operate effectively at the interface raises a particular

set of issues, to which I will return briefly later. Above the interface we have water service entities (WSEs) responsible for a range of functions (which apply equally to surface water, groundwater and derivative water (water already used and then passed downstream) such as planning, allocating and distributing water, monitoring and enforcing water quality, defence against water disasters, protection of ecology, and the construction and maintenance of facilities (Svendsen, 2005). While these enterprises may have a variety of forms (public/private/centralized/polycentric) they tend to have a bureaucratic structure and recognizable legal status, and those who work in them relate to them through some form of legal contract. Below the interface we commonly have water user associations (WUAs) responsible for the application and disposal of water at the local level. These tend to be much more fluid in nature and form. Whilst they may have legal status, that status is often much less well established than that of WSEs, and the relationship between members and WUAs is also a more flexible and dynamic relationship, than that between WSEs and their representatives. Various efforts have been made to define ‘design principles’ for water institutions both above and below the interface. We now turn our attention to these design principles, as a basis for thinking about capacity-building in the sector.

#### *Water Sector Entities (WSEs)*

A number of authors have identified design principles or desirable characteristics for WSEs. Perry, for example, has identified a number of basic elements which he believes are observable where management above the interface is effective (Perry, 1999). In brief terms, these essential components are summarized in an A-E list:

- Assessment of available resources
- Bargaining through the political process over resource allocation and service definition
- Codification of the agreed-upon allocation into laws and rights
- Delegation of implementation to appropriate institutions and agencies
- Engineering, to create the necessary infrastructure to deliver the agreed-upon services.

According to Perry, these elements should be hierarchical, the availability of resources forming a basis on which the subsequent elements evolve. Elements B to D form the basis of water governance, the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different levels of society (Rogers and Hall, 2002). With relevant governance systems established, appropriate infrastructure can be put in place. In practice it appears that these

components are often not hierarchical, and one of the challenges of irrigation modernization may be to negotiate the logic on which the roles and responsibilities of WSEs are worked out. For example, it is a widespread experience that systems of hydrological data collection and analysis are deteriorating and that information on current water availability and use are deteriorating as a result. Changing patterns of water availability (both surface and groundwater) may render some irrigation infrastructure obsolete, and call into question existing arrangements of rights and responsibilities.

In a similar way, Frederiksen has recently defined ‘characteristics of proven self-sustaining WSEs’ (Frederiksen, 2005). Frederiksen, drawing particularly on experience from the US blurs the distinction between organizations above and below the interface. For him, it appears, WSEs represent the interests of water users directly whereas in many other situations WSEs supply water services to customers or beneficiaries through some form of legal or customary agreement across the interface. According to Frederiksen, characteristics of self-sustaining WSEs include, amongst others:

- a reliable right to use the resource in an equitable manner
- a constitution independent of civil government, in which operating policies are set by the WSE itself
- a service charge set by the WSE sufficient for operation, rehabilitation and new construction, levied according to benefits.

Frederiksen’s interesting article draws on a number of geographical and historical examples but does not sufficiently take into account the difficulties and constraints in establishing these characteristics in WSEs in contexts such as irrigation modernization in Syria, nor does it allow for the complexity of managing across the interface.

#### *Water User Associations (WUAs)*

For organizations and groups below the interface, the most well-known set of design principles are those of Ostrom (1992). She developed these principles as a result of many years’ work on the management of common pool resources, using, amongst others, irrigation and groundwater as her case studies. Her analysis of long-enduring management systems for such resources led her to suggest:

- there should be clearly defined boundaries of jurisdiction over the resource.
- a clearly defined user group or community should manage the resource.



- locally appropriate rules must be devised.
- there should be clear identification of rights to resources and rules about them.
- those involved in resource use take part in decision making about the resources.
- decision making should take place in public, in arenas to which all resource users have access.
- accountable monitoring and effective authority structures are required.
- graduated sanctions should be devised for non-compliance with collective rules. such sanctions must be applied consistently, rapidly and impersonally.
- conflict resolution mechanisms should be clear, accessible and rapid.
- the ‘nesting’ of local institutions with other levels of decision-making and governance allows multi-layered management of resources in large and complex systems.

Whilst the design principles for WSEs discussed above relate to both organizational form and rules and relationships, it is noticeable that Ostrom’s principles refer in the main to rules and norms, and they put great emphasis on principles of clarity, transparency and accountability. In this they reflect other, more recent, authors who define principles of ‘good governance’. For example Rogers and Hall (2002), proposed that water governance should be open and transparent, inclusive and communicative, coherent and integrative, equitable and ethical and that in its performance and operation it should be accountable, efficient, responsive and sustainable. Many of these ideas are directly reflected in the Ostrom principles.

### *Limitations of Design Principles*

Design principles provide a useful starting point for thinking about institutional development. They are liked by policy makers and practitioners alike because of their simplicity and because they seem to provide clear and unambiguous guidance for ‘getting institutions right’. However they are also the subject of considerable debate and critique, on a number of counts (Clever and Franks, 2005). These centre on the limitations of design principles in taking account of the complexity of social life, particularly at the local level, and in assuming that institutions can be crafted and then evolve, through repeated interactions, into ‘good’ and ‘modern’ institutions operating to clear sets of principles. In reality, according to these critiques, people develop institutions in messy and unpredictable ways and these institutions then ebb and flow according to actions of the people within them and the flux of economic and social forces that act on them. In addition, institutions may be used in a variety of ways, and institutional ‘design’ may be subverted, either by water organisations not performing

their intended functions or by other institutions taking up some of the functions intended for them. Thus, at the local level, water user associations may exist in form only but have no influence on water management whilst actual water management practices and norms may evolve through the practice of institutions which are not overtly concerned with water use, such as family, kinship groups or networks of patronage. Similarly, at the level of WSEs also there is a need to be pragmatic about the extent to which it is possible to design an institution that operates according to abstract principles of good governance. On this basis, the principles should be thought of not so much as ‘design principles’ but as a theoretical framework or a set of concepts which need to be addressed during the process of organisational and institutional development.

### **An agenda for action**

Given the issues and constraints that I have described, what practical steps can be taken towards institutional development for irrigation modernization? I suggest three strands of activities, focused initially on understanding and analysis of the existing situation, as a precursor to strategies for the development of new and better institutions.

Firstly there is a need for some form of stakeholder mapping exercise. A typical example is described in Mahmoud’s account of the development of water boards at the district level in Egypt (Mahmoud, 2004). The mapping exercise was a thorough and wide-ranging activity but it worth noting that the emphasis tended to be on the formal and easily defined characteristics of organizations, such as their functions and rules, rather than the intangible, informal and non-bureaucratic practices which underpin the operation and relationships of each of the stakeholder organizations mapped in the exercise. Whilst information on informal processes and practices may be difficult to obtain, it may yet be crucial in understanding how water management is practiced at present and therefore how it might be improved in the future. It is also important to stress the need for the stakeholder mapping exercise to be wide in its scope and remit, so as to take account of important linkages between irrigated agriculture and other sectors of society.

Secondly, above the interface, there are a range of approaches available for assessing the existing WSEs and other organizations concerned with water governance and management.

Several of these are noted in DFID, 2003. One model proposes that organizations should be assessed against a range of components comprising: inputs and resources, strategy, culture, people and HRD management, systems and processes, structure, and outputs and performance, suggesting a range of questions to be addressed under each of these organisational issues, and noting also the relevant institutions (policies, rules and norms) that may affect them. Outcomes of this assessment can be correlated with the design principles of Perry and Frederiksen described above.

Thirdly, there is a need for strategy for strengthening organisations and institutions for water management at the local level. At this point I have deliberately avoided a focus on water user associations, since there is currently a tendency in irrigation and drainage to look to the formation of WUAs as the solution to many of the problems in the sector described in the first section, including irrigation management transfer ('to the lowest appropriate level') and also incidentally as a way of dealing with budgetary constraints on WSEs within the government structure. Very often WUAs are conceived as the appropriate organization form to meet the resource requirements of effective water management at the local level, without consideration of the fact that farmers and other water users may belong to a number of other institutions which serve their water management needs much better. There is therefore a need to build on the strengths of existing organizations, to investigate ways in which they might contribute to the overall goal of the modernization of irrigation in Syria, and to look for champions who can lead in the process of institutional reform and development. A related need, both in relation to WSEs and to farmer organizations, is to work at the interface between them and to strengthen appropriate institutions for co-operation and improved water management.

Finally, it must be stressed that capacity-building is a multi-level and multi-dimensional activity. As described earlier, it requires action at the policy level, and at the level of individuals, as well as the type of institutional assessment and development described in this paper. Without integrated action at all three levels, and a clear understanding of the political nature of the processes involved, investment in facilities and processes for irrigation modernization will not have the desired outcomes.

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