



Irrigation Advisory Services in the Near East

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1. Background

In May 2002 the Food and Agriculture Organisation held a workshop in Tunisia to examine the role of irrigation advisory services in the Near East region. The workshop was the first of its kind to address the issue of Irrigation Advisory and Training Services in the Near East Region. The specific aim was to review experiences inside and outside the region of the different advisory services presently available, to identify the potential and gaps and to recommend actions to assist national governments to promote appropriate irrigation advisory services and regional cooperation.

This paper presents the key issues discussed at this workshop, a summary of the country issues raised by the participants and a summary of the outcome and actions proposed.

2. Introduction

Countries in the Near East region have many resource problems in common. They all suffer from severe water shortages with some below the internationally accepted 'water poverty limit' of 500m³/capita/yr. They have rising populations demanding more water per capita and they rely heavily on irrigated agriculture, which in many cases absorbs more than 80 percent of the available water resources, for economic growth, employment and food security. This has led most countries to over-exploit their renewable and non-renewable water resources as well as less conventional resources such as wastewater and water from desalination. Domestic water supplies and industrial needs are clearly vital are unlikely to be compromised and so pressure to reduce the amount of water used in agriculture is likely to become intense at a time when there is also pressure to increase agricultural output.

There is a paradox in all this. Water is in short supply and yet agriculture, by far the largest user, wastes more than half the water it receives. So on one hand there is a severe shortage that is effectively constraining development and on the other there is enormous wastage. How can this be when such significant advances have been made in irrigation technology and water management tools that give farmers the wherewithal to apply water efficiently and uniformly in predetermined quantities to meet crop water needs? The problem lies in the lack of uptake and use of these technologies and the reasons for this are varied and complex. Many farmers just simply lack the skills to take full advantage of the technologies but for others the social and economic circumstances in which they live and work do not create sufficient incentives for them to invest in irrigation and to use water wisely. Governments too can compound the problem. Many put water saving as a top priority while at the same time they offer subsidies to irrigation-farmers to encourage more irrigation.

Providing farmers with the knowledge and skills to use water responsibly and efficiently is just one facet of reducing wastage and increasing productivity. It is not a new problem, it has long been commented on and governments and agencies have struggled with the issue since the significant investments in irrigated agriculture began in the 1970s and 80s. Irrigation Advisory services relate to all information and support provided by governmental, non-governmental and commercial services to introduce techniques and technologies and improved capacity that lead to a more efficient and better performing irrigated crop production. What kind of support is needed and how should it be provided was the subject of the FAO workshop.

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i. The need for support

Traditionally governments have taken on the role of providing farmers with knowledge and skills through agricultural extension services. But these have tended to concentrate on crops, fertiliser and pesticides rather than on water even in irrigated areas. Where governments have focused on water it has tended to be on the engineering and management of the main distribution systems and not on what happens at farm level. In cases where on-farm water management services have been provided there has often been a lack of resources to do the job properly. They tend to be under-funded and staffed by inexperienced technicians and do not have the logistical support to reach the farmers. Where there have been successes they have usually been underpinned by external aid and so there are question marks hanging over them about their sustainability once the support comes to an end.

There is little doubt that most people recognise the importance of support services to farmers but when it comes to investment in them there seems to be a blind spot. There is a preference for concrete infrastructure rather than investment in people. Indeed, few planners and project designers know how to set about building support service capacity in a systematic way. So it is not so surprising that, in spite of its importance, very little has been documented and published about the role and function of irrigation advisory services and more specifically about how well they perform and guidelines that other might follow. This situation has not been helped in recent years by the trend of transferring irrigation management responsibilities from government to farmers and the increasing amount of irrigation advice being organised outside the traditional government agencies by NGOs that do not normally have the resources to publicise their experiences. They tend not to collect the data, analyse it and publish it in the same way as governments and international agencies do. The result of this is that many countries have little or no experience of providing effective water management support services for their farmers and there is a dearth of information available that they might draw upon to see how others have tackled similar problems. They are therefore in danger of 're-inventing the wheel' and inevitably making the same mistakes that others before them have made.

ii. Near east experience

The dearth of information beyond the general nature of advisory services is illustrated in the papers prepared for the FAO workshop from Cyprus, Egypt, Iran, Jordan, Morocco, Turkey, Tunisia and Yemen. Each describes the irrigation situation in the country together with the way in which their irrigation advisory services are organised. But almost without exception the authors have found it difficult to obtain published information on which to base a detailed analysis of services and their performance. They describe the inadequacies of existing services and the need for improvement.

• Table 0 Near east countries - irrigated areas

Country	Irrigated area (000 ha)
Iran	7,500
Turkey	4,500
Egypt	3,300
Morocco	1,305
Yemen	490
Tunisia	380
Jordan	75
Cyprus	40

CYPRUS

Cyprus has a relatively small irrigated area (40,000ha) in comparison to the other countries in the Near East. The paper is one of the few that has detailed information on the range of support services that government provides to farmers. Services are free of charge to farmers and include on-farm irrigation, which is provided by the Water Use Section (WUS), a branch of the Department of Agriculture. WUS is a relatively small department and employs less than 50 technical staff and provides planning and design services as well as scheduling information and farmer training. Irrigation improvement programmes implemented through the WUS since 1965 have resulted in a gradual move from traditional surface irrigation to sprinkler and trickle irrigation methods that have the potential for improved water application and on-demand supply systems that can take advantage of scheduling methods such as tensiometers, evaporation pans and predictive evapotranspiration models.

Significant improvements in average water use efficiency are reported with 50 percent in 1965 rising to 84 percent in 2000. The impact of the small numbers of staff in the WUS appears impressive but they appear to rely on the main agricultural extension service as the principal vehicle for disseminating irrigation information to farmers. However, there are now growing concerns about the lack of irrigation experts in the country and worries about how services will cope with the country's transition into the European Union and the effects this will have on agriculture generally.

As irrigation-farming in Cyprus is reaching a mature stage of development it is not clear just how much farmers continue to depend on government advisory services. Do they for example, request services or are they provided in a top down approach that appears to have been the case in the past? There are concerns in government about the high cost of continuing to provide irrigation services as agriculture declines in economic terms in the country. Plans to transfer services to the private sector are tempered with concerns about the detrimental impact this may have on them.

EGYPT

Egypt has the third largest irrigated area in the region (3.3mha). It relies entirely on irrigation for its agriculture and its water supply is limited to a large extent by its allocation of the Nile flows. It has a long tradition of irrigation and water resources and (irrigated) agriculture being managed by separate ministries. The Ministry of Water Resources and Irrigation manages the large water distribution networks delivering water down to the tertiary level where farmer groups take over responsibility for its management on the farm. Farmers in the Nile valley have long experience of irrigation and the system of supply relies on them pumping water from the canals into their fields. The underlying philosophy is that as water (which is free) must be pumped and the fuel paid for then farmers will use it sparingly. But this philosophy is compromised when fuel is subsidised or when water is in command (above ground level) as it is in the new lands.

The Ministry of Agriculture supports farmers directly through its extension service but this concentrates on crops and fertiliser and not so much on water management. There appears to be little or no direct support to farmers in water management except for an Irrigation Advisory Service that was recently set up to facilitate the organisation of Water User Associations. This is about organising farmers into user groups to take on the responsibility for operation and maintenance at the tertiary level. The legal framework for this was established in 1995. WUAs and their grouping into Branch Canal WUAs may well provide a vehicle for irrigation advisory services to farmers as does the Farmer Field School approach to extension, which is being practised in some areas and includes soil and water management as well as cropping.

The top-down approach to water supplies essentially means that farmers do not have full control over their water supply and so the use of scientific methods to schedule irrigation becomes academic.

No clear critical analysis emerges from the paper of what farmers' support needs are or the role of the irrigation advisory service and the agricultural extension service in satisfying those needs.

IRAN

Iran has the largest irrigated area with 7.5mha but most of this is under governmental control. Irrigation services are provided by government to farmers in the form of hardware such as land levelling and canal lining and software such as training and advice. The latter is the responsibility of the Ministry of Agriculture extension service but it is reported to be very limited in scope and in some cases non-existent. Extension agents have very little knowledge of irrigation practices and target other mainstream agricultural issues.

There are few data available on which to examine the current structure of advisory services and to evaluate its effectiveness in supporting farmers beyond the reported poor average levels of irrigation efficiency of 30-37 percent and a reported comment 'there are many institutions in Iran that provide assistance in irrigation in one way or another. However, this should not be taken as a sign of extensive and well-planned services.'

JORDAN

Jordan has the second smallest irrigation area reviewed but the approach to irrigation is rather different to the other countries. Irrigation is confined mainly to the Jordan valley, which comes under the jurisdiction of the Jordan Valley Authority (JVA) for water management. Most farms are privately owned but the JVA has set up an Irrigation Advisory Unit. This offers design and on-farm management support and has introduced participatory management approaches. The Ministry of Agriculture is supposed to be responsible for extension services, including on-farm water management but the service is reported to be poor with few technicians having any specialist knowledge of irrigation. Although it was planned that the Ministry would participate with the Irrigation Advisory Service this has not materialised to date.

Water use efficiencies are reported to be less than 50 percent on about 60 percent of the farms but as high as 70 percent on the remainder. Water is charged for by the cubic metre but it is a highly political issue and it is not clear to what extent that charging affects the efficiency of use.

It is not clear just how successful the irrigation advisory services are in their support for farmers or just how the services will continue and who will pay for them bearing in mind that the farms are mostly private businesses.

MOROCCO

Morocco has well established formal large-scale government run irrigation schemes (approx 800,000ha) and informal smallholder 'private' irrigation schemes (approx 500,000ha). There is a well established government based institutional structure to support the large-scale schemes and this is in a process of change from a prescriptive system to one where farmers have more say in all aspects of decision making. But like other countries the agricultural extension service does not address irrigation issues. This is left to a separate group within the Ministry of Agriculture – the Administration du Génie Rural. It is not clear however, just how these services inter-relate or how effective they are, particularly as irrigation is undergoing a process of management transfer.

The small-scale sector, although quite large in area terms, is less well served by advisory services. Although it has been supported in various ways by government it is essentially the farmers who now have the responsibility to construct schemes and to manage water by organising into Water User Associations. There is also an emerging private sector that provides some irrigation advice as they sell various agricultural products.

One of the areas where improvements can still be made is in setting up effective and efficient irrigation advisory services, at least with respect to large-scale irrigation systems, which are the most important in the country.

TUNISIA

Tunisia has extensive areas under irrigation and like other countries in the region the government through the Ministry of Agriculture is the main player providing the lead and support for irrigation development and its management. However, in common with other countries the main support services are in support of agricultural inputs other than water. Training in irrigation is organised for farmers and there is extensive use of TV and radio, which are judged as a very successful way of getting information to the extensive rural areas. But there is concern about the ageing population of farmers who have poor education and the constraints this brings to the introduction of new developments. Few farmers, it is reported, actively seek information from the support services. Recommendations are put forward to improve services by technicians to answer key questions of when to irrigate and how much to apply.

TURKEY

Turkey is the second largest irrigation country in the region and has well-developed government institutions to deal with irrigation development both on a large scale and small scale. Although irrigation infrastructures and assets all belong to government, most irrigation schemes have been handed over from government to Water User Associations for operation and maintenance, a process that has been going on since 1994.

The Ministry of Agriculture (MARA) is responsible for farmer training in irrigated agriculture but the report expresses concerns about a lack of water management experts, a lack of training for farmers and also the lack of coordination between the government departments that are responsible for planning and design of irrigation development and MARA which is tasked with farmer training and management.

In spite of the extensive nature of irrigation there is again a dearth of information on which to judge the extent and performance of extension services to irrigation.

YEMEN

Yemen has extensive areas under irrigation, mainly spate irrigation and well irrigation. Agricultural extension has been the subject of considerable investment over the last twenty-five years but little is reported to have taken place in the provision of irrigation services and as a result they are practically non-existent. Farmers seldom visit extension centres to enquire about methods and issues related management of water for irrigation at the field level.

Improvements in irrigation have focused on conveyance systems and the introduction of modern methods of irrigation such as: drip, bubbler and sprinkler techniques. But these are as yet no scientific basis developed for the scheduling of irrigation water at the field level.

iii. Some common characteristics

The workshop confirmed the earlier comment that *very little has been documented and published about the role and function of irrigation advisory services and more specifically about how well they perform.*

Some common characteristics:

- All the authors described the importance of water, the concerns over shortages in their countries as well as the concerns over the substantial amount of water used in agriculture and the amount that is wasted, often

more than 50 percent of the supply. Yet some governments still promote irrigation development and encourage it using subsidies while at the same time saying they need to reduce the substantial amount of water used in irrigation.

- They identified a lack of irrigation advisory services as one of the principal reasons why irrigation efficiencies are so low.
- They describe how separate ministries or departments deal with water resources and agriculture. Irrigated agriculture sits between departments and relies on close collaboration between. This is an essential pre-requisite for successful irrigation but it is not always satisfied.
- They clearly found it very difficult to bring data together on advisory services in such a way that it provided a comprehensive case study that can be passed onto others as a model to learn from and to follow.
- Most authors described reasonably well-developed agricultural extension services but they were principally focused on crops, fertiliser, pesticides and equipment and not on water. The possible exceptions were Cyprus and Jordan. In the case of Cyprus it is perhaps the modest irrigated area (in comparison to the other countries) that is an important factor in the successful addition of irrigation to the extension service activities. Jordan too has a modest irrigated area and it is located in one small region under an integrated management authority, which enables agriculture and water to be more easily managed together.
- Most expressed concern about the lack of water management knowledge and experience among their extension staff and the need for training.
- Although some authors discussed farmer participation in irrigation O&M, the services available to them still seemed to be very top down in approach and this begs the question of who is deciding what services should be provided and just how well they are working.
- All expressed concern about the low level of irrigation knowledge among farmers and their ability to accept new ideas when farmers have had little or no formal education. They described the need for more farmer training but there is the question of whether more of the same is what is needed or is a different approach needed.

iv. Some questions to be answered

Although the lack of irrigation advisory services is not new problem, it has long been commented on and surprisingly little has been done to tackle solve it over the past 20 years or so. So it is perhaps not so surprising that very little has been written and published about them and more specifically about how well they perform. This leaves a large number of questions to be asked by anyone wishing to set up a new service or modify an existing setup.

If farmers are to acquire water management skills they will undoubtedly need support. But how can this be provided when irrigation advisory services either do not exist or the performance of those that do are disappointing? If the tradition of government provision continues how can the services be structured, delivered and paid for when most government departments are looking to cut expenditure rather than increase it?

There is a need first of all to gather information about advisory services to establish the current state of play. What irrigation advisory services are available? For the large numbers of farmers on government managed irrigation schemes, what kind of services do governments currently provide? Are they essentially scheduling services, do they train farmers and do they provide on-farm advisory support? How are they organised? Are they

top-down services supplied to farmers or do farmers have some say in the advice they need and when they need it? How well do these services work and who evaluates them – the farmers or government? Who pays for the services and are they cost effective?

As the current trend in irrigation is towards farmer participation and to hand over operational responsibility from government to farmers, how can advisory services change to reflect these changes? Does the government continue to provide them or should private services become the norm? Should they be more demand-oriented and should farmers be expected to pay for them as they are expected to pay for operation and maintenance?

There are many farmers who have always irrigated in a private capacity without any support from government. How can they be helped to improve their irrigation efficiency and productivity? Who should provide the help – government or private sector and who pays?

v. A way forward

The workshop participants emphasised that the outcome of the workshop needed to be a practical strategy to address what they saw as an urgent and significant constraint on irrigation development in all the countries of the near east region. Many common issues emerged from the discussions but it was also clear that many issues were specific to each country and to areas within countries as well. For this reason it was proposed that country specific Action Plans would be prepared, initially on a pilot basis, to address the deficiencies in advisory services. FAO would consider funding such pilot projects. A framework for regional cooperation was also discussed to continue the exchange of experiences.

The components for the Action Plans were assembled under three main headings:

- Priority technologies – identify the different technologies, which promote the efficient use of water, to be addressed in an advisory service including irrigation application systems, irrigation scheduling services, performance evaluation, support to Water User Associations etc.
- Service providers – identify existing institutions that could provide information/services (e.g. government ministries, extension services, colleges, research institutes and private sector) and facilitate the transfer of technologies to farmers and farmer groups. Identify a mechanism to ensure cooperation and coordination among the different stakeholders for an integrated approach for service provision.
- Training/capacity building – identify ways of putting in place a programme of training for farmers and service providers, adopting a participative approach and developing relevant training materials and appropriate communication methods. Several innovative ways training farmers and service providers were presented during the meeting.

In seeking a way forward, participants felt it was important to give a direct follow up to the findings and recommendations of the workshop by formulating a framework for technical cooperation as well as an outline for regional cooperation.

References

FAO (2002) Proceedings of Workshop on Irrigation Advisory and Training Services in the Near East. FAO in collaboration with Institut National Agronomique de Tunisie (INAT) Hammamet, Tunisia, 13-16 May.