



STAKEHOLDER VIEWS ON THE MIRAAB SYSTEM FOR PARTICIPATORY MANAGEMENT OF MODERN IRRIGATION SCHEMES IN IRAN

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ABSTRACT

Rural reforms in Iran have changed the land holding regime, cropping pattern, and market system. A study of stakeholder views on the modern Dez and Moghan irrigation schemes has suggested farmers and extensionists agree that the existing canal management is not sufficiently responsive to the new challenges of agriculture in the post-reform era, and that a more participatory management structure could help resolve the problems in water delivery. Iran already has a long-standing and successful model for participatory farmer management in the millennia-old Miraab system (*Shaarebin*) used for managing the Karezes and Qanats in the arid and semi-arid regions of Iran. This would appear to be a suitable model on which to build.

The survey responses indicated that all three stakeholder groups (farmers, extensionists and water agency staff) would support the implementation of a management structure based on the Miraab system. All three groups indicated they thought that the government would support such a change. Detailed interviews, however, suggested that farmers and extensionists thought some water agency staff would resist its implementation as a threat to their existing authority.

The research confirmed the importance of consulting different stakeholder groups, who might have different attitudes and perceptions of the problems and potential solutions.

Keywords: Stakeholder views, Participatory management, Mirhaab, Iran

INTRODUCTION

Agriculture is a vital sector of the Iranian economy contributing about 25% of the GDP. It employs about one third of the workforce in a country where there is a high rate of unemployment among the younger generation in rural areas (MoJA 2002). The Third FYP (1999-2004) aimed at achieving an annual expansion of irrigated land by 3.8%

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with a corresponding annual increase of 4.4% of water supply for agriculture. However, water management in many of the schemes is poor. It is mostly conveyed, controlled and delivered through unlined canals (*Anhaareh Sonnati*), resulting in its rudimentary and wasteful use (MoJA 2002). The MoJA estimated the application efficiency of about 30 % in the Dez and 20% in Moghan. This causes of poor farming and adverse environmental impacts.

The Dez and Moghan are the two largest modern irrigation schemes in Iran. They were originally designed to be operated by the state agencies and provide services for predominantly large agribusinesses. A major change in rural Iran after the Revolution in the late 1970's was a land reform programme redistributing some of the former agribusiness' lands among the small landless farmers. This was followed by a change in the cropping pattern that ideally necessitated a more flexible and reliable water delivery schedule than original rigid rotation regime was able to meet.

Problems that have been observed and documented by various sources (e.g. MoJA 2002, Keshavarz 1993), including those observed by the lead author during his professional field visits, include:

- Land fragmentation and tenure system in both schemes.
- Uneven irrigation due to poor land levelling.
- Environmental problems such as soil salinity, water logging and drainage problems (particularly in Moghan) due to poor O&M of the canals and imprudent on-farm practices.
- Poor water conveyance and control systems, and hence poor delivery at the farm gates, arising from inappropriate design and inadequate or deferred maintenance of the hydraulic structures.
- Lack of transparent authority over canal management, causing poor communication and cooperation between various stakeholders.

Direct management of the water distribution system by the state agencies appeared to have placed the farmers on a dependency situation and denied them the opportunity to participate in their O&M.

THE MIRAAB SYSTEM AND PARTICIPATORY FARM MANAGEMENT

The Miraab system is a traditional Iranian water management institution that was used for operating and maintaining the Karezes and Qanats in arid and semi-arid regions of the former Persian Empire, including the location of present Iran. Until recently, these artificial subterranean hydraulic structures were widely used to supply water for irrigation and domestic use, not only in the central desert regions but also in some semi-arid parts of Iran such as Dezful, where the Dez irrigation scheme is located (Behnia 1988). The Qanats and Karezes, of various lengths and shapes, were exclusively operated and maintained by private owners (most of whom were members of the farming community) through their representatives known locally as the *Miraabs*, *Abyaars* and *Tilmaaj* (Malakqasemi 1996).

The Miraab system was basically a bottom-up water management model whose operational principles were based on the service concept. In other words the needs of water users (e.g. efficient and reliable service delivery) within a given resource availability determined the ways in which the Miraabs operated and maintained the system. Their self-sufficiency in managing all the operation and maintenance (O&M) duties of the Qanats was assured by direct labour or financial contributions of the water users. In earlier times, the feudal landlords generally made their contributions in cash or crops, whereas farmers either offered direct labour or a package including labour, crop and cash. Certain farmers traded their water rights and devoted themselves full-time to the O&M duties in return for wages. Still others used the *Nizaameh Moshaaee*, a land pooling system for crop sharing with their neighbouring farmers, and rotated the O&M duties and farm works among themselves.

The Miraabs had responsibility for making decisions on all aspects of O&M, including collecting water charges and solving conflicts over water allocation, but were ultimately accountable to the *Showrayeh bahrebardaraan* (the supreme Miraabs council), which represented the whole farming community.

Although the Qanat system is an old civil engineering concept, the Miraabs (as major operators and users) recognised the importance of introducing modern technology to meet the water requirements of their beneficiaries. The Qanat operators, through the Miraab system, have begun to incorporate modern design concepts such as the construction of concrete dams along the underground conveyance galleries in order to store water in the pools when the demand was minimal. They have also installed some heavy-duty pipes and valves in certain Qanat networks for more efficient water control, conveyance, and distribution. They have recognized the benefits of introducing modern maintenance techniques and better materials to make the operations simpler and the use of labour and financial resources more efficient.

The indigenous Miraab system played a key role in sustaining the rural structures and livelihood of the farming community, for example in the central desert regions of Iran such as Ardekan and Yazd (Dehqanpoor 1999). This integrated approach to water management is suggested as a more cost effective and sustainable model for the management of the surface irrigation network.

STAKEHOLDERS' VIEWS

Stakeholders' views were used to investigate the water delivery problems and their causes on the Dez and Moghan irrigation schemes, and then to investigate their views on alternative management systems. After preliminary field visits, four workshops were organised to identify the main issues. A survey was then undertaken of 100 farmers, 50 government agricultural extension officers and 50 water agency staff, augmented by 36 interviews.

The major problems of water delivery relevant to the Dez and Moghan were identified by the workshops as inequitable allocation, inflexible supply, group conflicts and adverse environmental impacts.

However, there was a significant difference in perceptions of the stakeholders surveyed in the nature and sources of the water delivery problems. The farmers and extensionists

perceived inequity and inflexibility due to poor O&M in the main and secondary canals as the most important water delivery related problems. In contrast, the water agency staff regarded group conflicts over water allocation and adverse environmental impact, due to mismanagement of the tertiary and quaternary canals as well as poor on-farm practices, as the most important. Notably, the farmers and extensionists had similar views on all issues except on water charges, where the extensionists (agreeing with the agency staff) thought that it would be impossible to improve the water delivery without increasing the charges. In contrast, the farmers thought that higher charges alone would not help, because the problems lie with inadequate design of the hydraulic structures and the present inappropriate canal management system.

The perceptions of respondents on modernization options varied. The farmers and extensionists regarded neither purely technical nor purely non-technical changes as adequate. The perception was that the farmers, extensionists and the agency staff, in that order, would support an integrated Miraab system as an appropriate management option. Although the survey responses suggested that all the stakeholder groups would support the Miraab system, the responses from the interviewees suggested that the majority of the farmers and extensionists thought the senior water agency staff would resist it. The farmers and extensionists alleged that the agencies' resistance was linked to their anxiety of losing authority in canal management. The response of the agencies was that they were willing to support the change but were doubtful of its chances of success, because the extensionists have not yet prepared the farmers to take up the new challenges. All three-stakeholder groups regarded the central government's support for the change in the present system as crucial, and in their view it would be forthcoming.

CONCLUSIONS

The Miraab system is an indigenous farmer-managed system that offers a viable alternative to the present state management system. All the stakeholder groups surveyed indicated they would support its introduction, though some doubts were expressed in interviews about senior water agency staff.

It is suggested that farmer organizations should take the government's interest in irrigation management transfer as a window of opportunity to take up the stewardship of, initially, the tertiary water distribution system. They should use their indigenous knowledge to achieve the flexible demand management required for viable modern farming.

The commitment of farmers and support of other stakeholders are both crucial for success of the Miraab systems in the new working context. Successful management of the tertiary canals would be a good start for the ultimate establishment of the full farmers' stewardship of the main and secondary canals in the future.

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