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تحلیل نگرش کارشناسان به موانع و چالش‌های انتقال مدیریت آبیاری به بهره‌برداران، پژوهشی بر مبنای روش کیو

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چکیده مبسوط

۱. مقدمه

آبیاری کوچک مقیاس کلید معیشت روستایی و امنیت غذایی در کشورهای در حال توسعه می‌باشد، به ویژه در مناطق با بارش کم و نامنظم، و تبخیر زیاد که تولید محصول در مناطق خشک را محدود می‌نماید. با این حال، با وجود سرمایه‌گذاری‌های عظیم دولت در ایجاد و نوسازی برنامه‌های آبیاری خرد، برخی از این برنامه‌ها بعد ازخاتمه حمایت دولتی با ناکارآمدی و فروپاشی مواجه می گردند. در نتیجه، بسیاری از کشورها برنامه‌های انتقال مدیریت آبیاری از سیستم‌های دولتی به بهره‌برداران آب را از طریق اجرای سیاست‌های انتقال مدیریت آبیاری(IMT) و مدیریت مشارکتی آبیاری(PIM) در دستور کار خود قرار دادند. پژوهش حاضر تلاشی در جهت نگرش سنجی موانع و چالش‌های انتقال مدیریت آبیاری با استفاده از روش کیو می باشد.

۲. چارچوب نظری

بین دو سرنام PIM و IMT یک تمایز مهم وجود دارد. ویژگی کلیدی PIM، مشارکت کشاورزان در مدیریت سیستم هایی است که به آن وابستگی دارند. این که مستقیم یا غیر مستقیم مشارکت نمایند، یا به عنوان مالک یا مشاور نقش داشته باشند، در این تعریف بازگذارده شده است. مهم کمیت مشارکت می‌باشد، و برای شکل مشارکت قالب خاصی در نظر گرفته نشده است. ویژگی کلیدی IMT خارج شدن مدیریت از دستان دولت و قرار گرفتن در دستان کشاورزان می‌باشد، این که کشاورزان در مدیریت جدید سیستم مشارکت نمایند، از معنای IMT استخراج نمی‌گردد.

همان‌گونه که انواع مختلفی از تمرکززدایی وجود دارد. یعنی تمرکززدایی سیاسی، اداری و مالی، بنابراین مدل‌های مختلفی از انتقال مدیریت آبیاری وجود دارد. این مدل‌ها از لحاظ تمرکز، مقیاس، پاسخگویی واحد مدیریت و دامنه کارکردها و حقوق دارایی انتقال‌یافته به کشاورزان متفاوت هستند. مدل‌های اولیه IMT (۱۹۵۰ تا ۱۹۷۰) بیشتر بر کشاورزی غیر فقیر، بازارگرا، بزرگ مقیاس و شبه تجاری نظیر مزارع بزرگ در ایالات متحده، مکزیک، نیوزلند و ترکیه تمرکز می‌نمود. هدف این مدل‌های اولیه، صرفه‌جویی در هزینه‌های دولتی، بهبود عملیات و نگهداری، بهره‌وری هزینه و حفظ یا افزایش بهره‌وری کشاورزی آبی بود. دولت به طور معمول آغازگر این امر بود و کلیه کارکردهای مالی و نگهداری و حفظ به کشاورزان انتقال می‌یافت. ولی مالکیت در دست دولت باقی می‌ماند.در مقابل، مدل‌های جدیدتر IMT (۱۹۸۰ و ۱۹۹۰) در جنوب و جنوب شرق آسیا، آمریکای لاتین و آفریقا بر کشاورزی فقیر، کوچک مقیاس و بازار محلی‌گرا تمرکز نموده‌اند.در حالی که اهداف رسمی یعنی صرفه‌جویی در هزینه‌های دولتی، بهبود عملیات و نگهداری، بهره‌وری هزینه و حفظ یا افزایش بهره‌وری کشاورزی آبی، به قوت خود باقی است، IMT حتی اگر فقط موجب صرفه جویی در هزینه های دولتی و بهبود بهره‌وری مجموعه گردد، به طور فزاینده ای به عنوان یک رویداد موفق در نظر گرفته می شود.

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۳. روش شناسی

پژوهش حاضر از لحاظ هدف، کاربردی و از نظر شیوه انجام از نوع ترکیبی (کمی-کیفی) می باشد. برای شناسایی چالش‌های انتقال مدیریت آبیاری از روش کیو استفاده شده است. در روش کیو، به جای متغیرها، افراد تحلیل می‌شوند و این، تفاوت اصلی این روش با سایر روش‌های تحقیق در علوم اجتماعی است. جمع‌آوری داده های این پژوهش در دو مرحله صورت گرفته است. ابتدا پرسشنامه‌ای حاوی دو سؤال در زمینه موانع و چالش‌های انتقال مدیریت آبیاری بین کارشناسان و مدیران دو سازمان دست‌اندرکار مدیریت آب کشاورزی توزیع گردید و پس از جمع‌آوری دیدگاه‌های آن‌ها و بررسی منابع داخلی و خارجی، تعداد ۴۱ گویه استخراج گردید. در مرحله دوم تعداد ۳۰ مشارکت کننده، شامل ۲۰ نفر ازمدیران و کارشناسان سازمان آب منطقه ای و جهاد کشاورزی گیلان و ۱۰ نفر اساتید گروه آب و گروه توسعه و برنامه‌ریزی روستایی دانشگاه‌های گیلان و خوارزمی تهران به روش" نمونه گیری هدفمند" انتخاب گردیدند.

۴. بحث

نظر به اینکه در روش کیو تلاش بر این است که از رویکرد اثبات گرایی فاصله گرفته و به جای تمرکز بر کشف یک واقعیت عینی بپذیریم که مسائل اجتماعی می توانند واقعیت های متفاوتی از منظر افراد و گروه‌های مختلف داشته باشند، بر این اساس می‌پذیریم که چالش‌های اولویت بندی شده توسط هر سه گروه عوامل کلیدی در تحقق مدیریت مشارکتی آبیاری بوده و هر گروه با دانش و بینش و نگرش متفاوتی که به موضوع دارند آن را بررسی و اولویت بندی نموده اند. لذا ضمن اینکه اولویت‌هایی که به صورت مشترک توسط هر سه گروه مورد تاکید قرار گرفتند راهگشا خواهد بود، پرداختن به اولویت‌هایی که به طور جداگانه و منبعث از تفاوت در دیدگاه‌های این گروه‌هاست اجتناب ناپذیر و ضروری می‌باشد بر این اساس می‌توان گفت گروهی که کارشناسان با اکثریت اعضای هیت علمی دانشگاه عضو آن بودند چالش‌های فرهنگی – سازمانی را مهم‌ترین موانع تحقق مدیریت مشارکتی آبیاری می دانند (به عنوان مثال، فقدان زمینه‌سازی و فرهنگ‌سازی مناسب برای تشکیل تشکل‌های مدیریت آب، اقدام شتابزده دستگاه‌های متولی در امر تشکیل و ساماندهی تشکل‌ها بدون توجه کافی به زمینه‌های فرهنگی، فقدان استفاده از ظرفیت‌های محلی و بومی).

دسته دوم گروه کارشناسان اجرایی با اکثریت کارشناسان وزارت کشاورزی بوده اند که باور دارند موانع فنی و اجرایی نقش پر رنگ‌تری از موانع فرهنگی در چالش‌های انتقال آبیاری به بهره‌برداران دارد (به عنوان مثال، استهلاک تاسیسات زیربنایی، فرسودگی و افت کیفیت شبکه‌های آبیاری و زهکشی، نگرش سیاسی بر نگرش اقتصادی به آب، نبود سازوکار مناسب برای هماهنگی بین بهره برداران با دستگاههای اجرایی).

در نهایت از دیدگاه گروه سوم که گروه نسبتا کوچک‌تری در مقایسه با دو گروه دیگر بود، چالش عمده تحقق مدیریت مشارکتی آبیاری ریشه در مسائل آموزشی- فرهنگی دارد. از نظر این گروه عدم زمینه‌سازی و فرهنگ‌سازی مناسب برای تشکیل تشکل‌های آبیاری و ورود شتابزده دستگاه‌های دولتی، ضعف سیستم آموزش رسمی و غیر رسمی در زمینه مدیریت مشارکتی، عدم مشورت و نظر خواهی از بهره‌برداران در خصوص چگونگی واگذاری تصدی‌گری آب، ضعف اطلاع‌رسانی و برنامه‌های فرهنگ‌سازی برای زارعین و کارشناسان، و روشن نبودن جایگاه ذی‌نفعان و ذی‌مدخلان مهم‌ترین موانع برای تحقق مدیریت مشارکتی آبیاری می‌باشد.

۵. نتیجه گیری

بر اساس نتایج تحقیق، گروهی که کارشناسان با اکثریت اعضای هیت علمی دانشگاه عضو آن بودند چالش‌های فرهنگی – سازمانی را مهم‌ترین موانع تحقق مدیریت مشارکتی آبیاری می‌دانند. دسته دوم گروه کارشناسان اجرایی با اکثریت کارشناسان وزارت کشاورزی بوده اند که باور دارند موانع فنی و اجرایی نقش پر رنگ‌تری از موانع فرهنگی-سازمانی در این زمینه دارد.در نهایت از دیدگاه گروه سوم که گروه نسبتا کوچکتری در مقایسه با دو گروه دیگر بود، چالش عمده تحقق مدیریت مشارکتی آبیاری ریشه در مسائل آموزشی- فرهنگی دارد.

کلید واژه ها: انتقال مدیریت آبیاری، مدیریت مشارکتی آبیاری، روش کیو.

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A Q Methodology-Based Analysis of Experts' Attitudes towards Obstacles and Challenges of Irrigation Management Transfer to Farmers

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Abstract

Purpose: Using Q-methodology approach, this study attempts to examine the attitudes of experts towards the barriers and challenges of irrigation management transfer.

Methods: In terms of purpose and research methodology, this study is applied and mixed-method (quantitative-qualitative), respectively. To identify the challenges of irrigation management transfer, Q methodology was used. In the first phase, a questionnaire containing two questions about the barriers and challenges to irrigation management transfer were administered to experts and managers of two organizations involved in agricultural water management. After collecting their views and reviewing internal and external resources, 41 items were derived. In the second phase, 30 participants including 20 managers and experts from Guilan Jihad-Agriculture Organization and Guilan Regional Water Authority, as well as 10 faculty members from Departments of Water, Development and Rural Planning in universities of Guilan and Kharazmy were studied. The participants were selected using purposive sampling method.

Findings: Based on the results, a group of experts with the majority of faculty members believed that organizational and cultural barriers were the most important obstacles to the realization of participatory irrigation management. The second group including executive experts with the majority of Guilan Jihad-Agriculture Organization members mentioned that technical and administrative obstacles had more prominent role than cultural and institutional barriers. Finally, from the perspective of the third group that was relatively smaller than the other two groups, the major challenge in non-realization of participatory irrigation management was rooted in cultural-educational issues.

Limitations: Because this study was conducted in the first half of the year characterized with the peak agricultural activity, access to key managers and experts of Guilan Regional Water Authority was very difficult and time consuming.

Practical implications: Codification of clear and practical guidelines enjoying impressive views of the three groups of stakeholders (Ministry of Energy, Ministry of Jihad-Agriculture and academia) in the field of enforcement mechanisms, consulting, regulatory, determination of duties according to the executive, advisory and monitoring position, and avoiding frequent changes in executive agencies responsible for participatory irrigation management can be helpful in this regard.

Authenticity: To date, several important studies have been conducted in this area, each one being an appropriate guide by itself. Distinguished feature of this study is that it looked at this issue from another perspective and tried to study the problem in a distinct way (Q-methodology) from the point of view of different groups involved to compare the differences of views and to drive distinguished components of the three groups' standpoints (based on the career status of the respondents).

Key words: Irrigation management transfer, participatory irrigation management, Q Methodology.

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1. INTRODUCTION

1.1. Problem Statement

In the modern world, factors like the explosive growth of global population and the over-exploitation of environmental resources to meet the economic needs have had their own impacts on water resources so that water crisis and management is, according to the UN, the second most critical global problem after the population growth (Bezi, Khosravi, Javadi, & Hosseinnezhad, 2010, P. 2).

So far, agriculture has been the main user of global reserves of water, soil and biodiversity. Seventy percent of global water is consumed by agricultural activities and if we consider just developing countries, this share will approach 85% (Garces-Restrepo, Vermillion, & Muñoz, 2007, P. 1).

Small-scale irrigation is the key to rural livelihood and food security in developing countries, especially in regions with low, intermittent irrigation and high evaporation that limit crop production in arid regions. However, despite of massive governmental investment in the construction and rehabilitation of micro-irrigation programs, some of them are rendered inefficient and collapse after the termination of state support (Muchara, Ortmann, & Mudhara, 2014, P. 699).

As a result, countries approach the programs to transfer irrigation management from state systems to water users by fulfilling Irrigation Management Transfer (IMT) and Participatory Irrigation Management (PIM) policies (Perret, 2004, P. 5; Arun, Singh, & Kumar, 2012, P. 409; Gomo, Mudhara, & Senzanje, 2014, P. 437).

States (around the world) mention several reasons for the transfer of managerial responsibilities to farmers. The main ones include states' inability of investing on irrigation management and maintenance, state's inability in offsetting the costs of irrigation equipment exploitation and maintenance, low-return management, and the improved self-confidence of farmers and private sector to accept irrigation system management (Ghanaat, Mamanpoush, & Aghababayee, 2013, P. 1). Therefore, the devolution of the management of irrigation network to farmers has been increasingly considered throughout the world since the late 1980s in so far as it has been turned into a national policy in most Asian, African, and Latin American countries (Najafi & Shirvanian, 2006, P. 55).

Irrigation management transfer programs can be considered as the consequence of global tendencies like market economics, privatization, decentralization from central governance, and empowerment of local communities in irrigation sector, and most states pursue these programs because of such reasons as poor utilization and maintenance management, inadequate care for farmers' satisfaction, low, sluggish performance of workflow, and faster erosion of networks (Mortezanezhad, Yaghoobi, Sotoodenia, & Daghestani, 2014, P. 184).

The ten-year experience of Iran has shown that Iran has adequate organizational potential to transfer irrigation management to private sector. But, this potential is not correctly oriented towards providing the conditions for farmers' participation in the management of networks (Ghenyan, Baradaran, Mirzaee, Solaimani Harooni, & Pasha, 2013, P. 182).

Today, there is no doubt about the need for the delegation of resources management to local users anymore; rather, the relevant question for experts is that how it should be done (Yaghoobi, 2009, P. 1).

In Iran, extensive studies have focused on finding the causes of the inefficiency and success or failure of these programs and each one has paved the way to find a sustainable solution for the provision of the conditions for the success of these programs and farmers' sustainable participation. The present study approached the issue from another perspective with a focus on the barriers and challenges of irrigation management transfer on a macro and micro basis and attempted to investigate the barriers and challenges with a distinctive method and from the viewpoints of different involved groups.

1.2. Literature Review

The complete transfer of irrigation management to users or their partial participation in agricultural water management has had a story of success and/or failure around the world, which have been extensively studied.

Heidarian and Eslami (2009) divide the problems of irrigation systems management into two general categories of problems in physical structure and problems in social structure. They suggest that over half a century of domestic experience in the study, design and construction of irrigation network has hardly left a place for questioning the physical structure of the irrigation networks. In addition to having research standards

and executive guidelines in place, the technical and executive system of Iran has already dealt with these issues, leaving the least number of drawbacks, so that as soon as a piece of equipment is brought into the workshop, a group of experts including technical office in charge, technical audit group, executive supervisor, etc., appear with a plenty of documents, guidelines and standards. But, the second part, i.e., social structure of the network, has not been considered as the minimum requirement so that there is no specific, predetermined standard for the study, development, and construction of social structure and any group of consulting engineers specialized in dam and network design is authorized to enter this field and develop the social structure in the absence of the required mechanism for the control and management of this part.

Some problems and barriers in the face of structural definition for IMT to water users associations in Iran can be listed as follows: the lack of integrated agricultural water management, the lack of adequate and efficient political guarantees, the lack of capacity and potential to establish local organizations or to change them to make them ready for management delivery, the lack of motivation among users, the ambiguities in water rights, the lack of moderately costly and highly profitable irrigated farming, low risk-taking among users, low motivation among users to acquire the management, negative presuppositions about government, governmental works and participation, lack of potentials in rural areas (including the lack of specialized and capable people), and low self-esteem among people (Ahmad Ali et al., 2010, P. 3).

Rahimi Reazabad, Yazdanpanah, Foroozani, and Mohammadzadeh (2014) categorized the obstacles to optimum agricultural water management into four groups – economic and financial, planning, education and extension, and natural obstacles in the order of importance.

Some other challenges include the inadequate consistency between national policies and agricultural water exploitation, lack of operational plan in national water management for integrated management of agricultural water supply and demand, lack of appropriate approaches and motives for investment in development, exploitation and maintenance of water resources and facilities, inefficient management of planning, studying, developing, and fulfilling water resources and facilities, and inadequacy of training, empowerment and capacity creation plans to improve the productivity of agricultural water use (Heidery, Heidarian, Hashemi, Karamati, & Alimohammadi, 2009, P. 4).

Facon (2007) relates the weak performance, control and services of FAO's irrigation management rehabilitation plan to the problems in preliminary design, imitative design that ignores local features, problems in systems control and administration, designing with unclear and ambiguous hierarchy, excessive seriousness in operational approaches, discrepancies in operational regulations at various levels, discrepancies between operational regulations and farmers' requirements, unresponsiveness of system management policies to the variations in farmers' requirements, poor quality of services delivered to farmers, and inflexibility at all levels. Inadequate dialogue between stakeholders, incompetency of the council's representative, and discrepancies and inconsistencies in regulations and guidelines are some main challenges of water governance (Lemoine, 2011, P. 33).

In a study on the effect of institutions on water governance and management, Cave (2012) mentions seven key findings about formal and informal water institutions and their impact on the governance and management of water resources. They include accountability and transparency, productivity and effectiveness, equality, adaptability, adaptation with public moral, fostering public trust, and access to financial and technical resources. In a study on the challenges and opportunities of water conservation program, an emphasis has been placed on stable financial resources, educational opportunities for local communities, public communication, adequate participation of stakeholders, revision and re-evaluation of the programs, and access to data/information (Wang, 2013, P. 60).

2. METHODOLOGY

2.1. Methods

The present work was an applied study in terms of objective and a combined (quantitative-qualitative) work in terms of methodology. The challenges of irrigation management transfer were identified by Q Methodology. The dependent variable was the complete or partial transfer of irrigation management to farmers that can be realized by the emergence of institutions and effective ground to encourage users' participation.

Some researchers divide Q Methodology procedure into five steps and others divide it into two steps (Hosseini, Behjaty Ardekani, & Rahmani, 2011, P. 62). We used the five-step process including the identification of barriers and challenges, the examination and selection of items, the selection of participants, sorting of items by participants, data entry into Q method software package, and their analysis and interpretation.

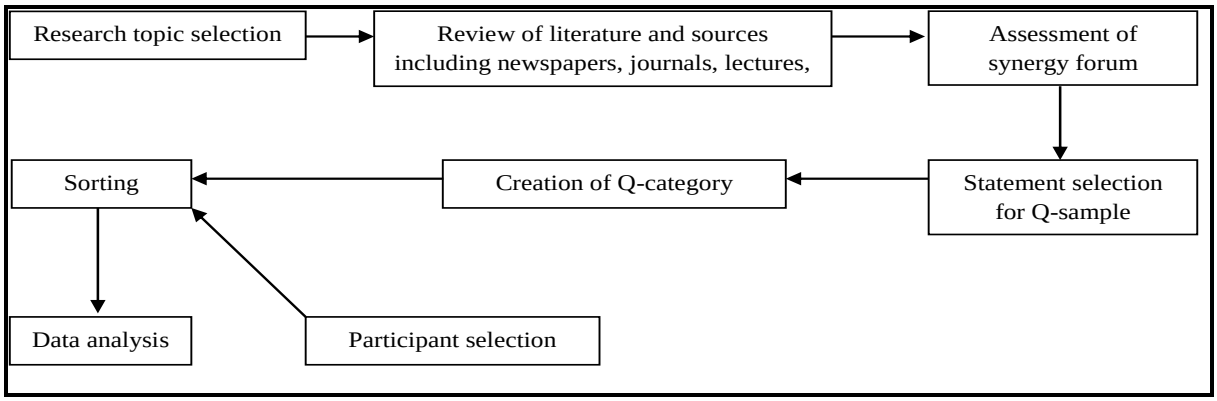

Figure 1. The phases of a research based on Q-methodology (Mobareki, Zali, & Dehnad, 2013, P. 22)

2.2. Five Steps of the Study

Step 1: Identification of barriers and challenges. At this step, 64 items were identified as the barriers and challenges of participatory irrigation management after the review of literature and interviews with 20 managers and experts of Regional Water Organization and Agriculture Jihad Organization of Guilan.

Step 2: Examination and selection of items (Q statements). At this step, the identified factors were first examined and classified under the supervision of five relevant experts and professors and then, the similar items were combined and removed to yield 41 items that are shown in Table 1.

Table 1. Final Q statements
(Reference: Research findings, 2016)

Code	Item
1	**Departmental planning system** in irrigation management is the main obstacle to participatory irrigation management.
2	**The weaknesses of judiciary and legislative bodies** in institutionalizing participatory irrigation management are the main obstacles to participatory management of irrigation resources.
3	**Frequent, impetuous change of administrators** of participatory irrigation management is the main obstacle to participatory irrigation management.
4	**Inefficient crop markets** are the main obstacles to participatory irrigation management.
5	**The wide area of irrigation and drainage networks** for management transfer is the main barrier against participatory irrigation management.
6	**The lack of an appropriate mechanism for coordination between governmental agencies** is the main obstacle to participatory irrigation management.
7	**The lack of a proper mechanism for coordination between users and executive organizations** is the main barrier of participatory irrigation management.
8	**The lack of a proper mechanism for coordination among users** is the main obstacle to participatory irrigation management.
9	**Legal barriers and restrictions for inter-department and inter-organization collaboration** are the main obstacles to participatory irrigation management.
10	**Poor knowledge and skill among users** for managing agricultural water resources are the main obstacles to participatory irrigation management.
11	**Weak regulations concerning the exploitation of irrigation resources by use**rs are the main obstacles to participatory irrigation management.
12	**The lack of governmental financial resources for participatory projects and the lack of utilizing the potential of associations** are the main obstacles to participatory irrigation management.
13	**Legal constraints and limitations for the cooperation of rural communities with executive institutions** are the

	main obstacles to participatory irrigation management.
14	**The lack of coordination in agricultural support packages** is the main barrier against participatory irrigation management.
15	**Ambiguities in regulations and the lack of a legal ground for the delegation of water affairs to farmers** are the main obstacles to participatory irrigation management.
16	**Centralized planning system of irrigation management** is the barrier against participatory management of irrigation resources.
17	**The lack of a strong monitoring system for the studies and their fulfillment** is the main obstacle to participatory irrigation management.
18	**Depreciation of infrastructure, weariness and quality loss of irrigation and drainage networks** are the main barriers against participatory irrigation management.
19	**Overlooking the local potentials for participatory management** is the main barrier for participatory management of irrigation resources.
20	**Negative experiences of participatory works like production cooperatives** are the main obstacles to participatory irrigation management.
21	**Expertise poorness and the lack of experienced, accountable people in the organizations in charge** are the main barriers to participatory irrigation management.
22	**The predominance of political attitude over economic attitude towards water** is the main obstacle for participatory irrigation management
23	**Weak structure and poor performance of the responsible executive organizations** like Regional Water Organization and Jahad-e Agriculture Organization are the main obstacles to participatory irrigation management..
24	**The lack of precise studies on how to transit from current management to participatory management** is the main obstacle to participatory irrigation management.
25	**Negative attitudes and the lack of mutual trust between executive organizations and users** are the main barriers of participatory management of irrigation resources.
26	**Overlooking the potentials and challenges of upstream and downstream villages** is the main obstacle to participatory irrigation management.
27	**The inconsistency between the soul of participatory management and the governance niche of the responsible institutions** is the main obstacle to participatory irrigation management.
28	**Ambiguities about the role of stakeholders in participatory irrigation management** are the main problem of participatory management of irrigation resources.
29	**The lack of financial support of participatory projects by Agribank** is the most important barrier to participatory irrigation management.
30	**The lack of guidelines and technical documents** about how to participate the farmers and enforcing issued procedures are the main obstacles to participatory irrigation management.
31	**Following the imported foreign (national and international) models** of participatory management of water resources is the main barrier against participatory irrigation management.
32	**Weak communication and culture-building programs** for farmers and experts are the main challenges for participatory irrigation management.
33	**The weak formal and informal educational system** is the main challenge for participatory irrigation management.
34	**The lack of preparations and culture-building to found irrigation establishments** and impetuous intervention of governmental bodies are the main problem of participatory irrigation resources management.
35	**The lack of consultation with users** about how to delegate water authority is the main barrier against participatory management of irrigation resources.
36	**The dominance of technical approach** like the construction of numerous dams and the excessive digging of wells are the main obstacles to participatory irrigation management.
37	**The lack of coherence and cooperation among users** is the main obstacle to participatory irrigation management.
38	**The lack of diversity in farmers' income sources** is the main obstacle to participatory management of irrigation resources
39	**The lack of national water accounting system** is the main obstacle to participatory management of irrigation resources.
40	**The lack of water tariff for unauthorized wells** is the main obstacle to participatory irrigation management.
41	**The lack of convergence and coordination between contractors, consultants, supervisors and users** are the main barriers against participatory management of irrigation.

Step 3: Participant selection. The study had 30 participants (including eleven managers and experts at Regional Water Organization, nine managers and experts at Agriculture Jihad Organization of Guilan, and ten academic professors at Department of Water and Department of Rural Development and Planning in the universities of Guilan and Kharazmi) who were selected by purposive sampling method.

Step 4: Preparation of Q-cards (items) and their sorting by participants. At this step, a diagram with 41 cells was designed with quasi-normal distribution. Then, it was administered to respondents (Figure 2) to rank the Q-cards in

terms of the extent of agreement (completely agreed (+4) through neutral (0) to completely disagreed (-4)). It should be noted that the items were numbered at the back of the cards. Then, after the respondents ranked the cards, the numbers at the back of the cards were registered in the cells of the respective diagram.

Please arrange 41 cards that you received in the following cells in terms of the extent of your agreement/disagreement. Please place just one card in each cell. For simplicity, first divide the cards into three categories – agreed, disagreed, no idea.

Age:	Position:	Career length:	Workplace:	Education:	Major:

Disagreed ← **No idea** → **Agreed**

-4 Very strongly	**-3 Strongly**	**2 Weakly**	**-1 Very weakly**	**0 No idea**	**1 Very weakly**	**2 Weakly**	**3 Strongly**	**4 Very strongly**

Figure 2. Q-diagram

Step 5: Data entry to Q Methodology software. Data were entered into Q software. The demographic data including age, education, work experience, and work place were entered into the software as codes. As is evident in Table 2, the initial two letters represented educational level (Ph = Ph.D., Ms = Master's and Bs = Bachelor's degree), two initial digits represented the age, two last letters represented the occupation (Ke = expert in agricultural department, Ie = expert in irrigation department, and Un = academic professor), and two last digits represented their work experience.

Table 2. Factor loading of the groups and participants' dispersion in them shown by an x mark
(Reference: Research findings, 2016)

Participants/factors		1	2	3
1	Ph39ke11	0.1292	0.4279X	0.0689
2	ph46ie18	0.3359	-0.0228	-0.3907X
3	Ms57ie30	0.0443	0.6108X	-0.2917
4	Ph55ie25	0.6395X	0.3305	-0.1745
5	Ph36ie10	0.1829	0.4574	-0.4563
6	Ph45ie20	0.5030X	0.3509	0.266-
7	Ms44ke16	0.7215X	0.0736	0.0544
8	Ms52ke25	0.3725	0.4939X	0.0193
9	Ph42un15	0.5130X	0.0895	0.0401
10	Ms50ke25	0.3918	0.5081X	-0.0194
11	Ms49ke22	0.6795X	-0.2137	-0.196

12	Ms45ke20	0.2126	0.3444	0.6968X
13	Ms56ie29	0.6513X	-0.0347	-0.1554
14	Ph37un6	0.3347	-0.0561	-0.3957X
15	Ph43un11	-0.0858	0.4737X	-0.2434
16	Ph38un8	0.4786X	0.0662	-0.0825
17	Ph33un4	-0.0626	0.2833	0.3969X
18	Ph50un25	0.5540X	-0.1683	-0.3485
19	Bs48ke25	0.224	0.3788X	-0.0876
20	Bs60ie30	0.1542	0.0018	0.003
21	Ph57un24	0.7106X	0.2065	0.1455
22	Ph43un11	0.4146X	0.2464	0.2831
23	Ms45ie20	0.3563X	-0.0908	-0.0493
24	Ms38ie15	0.2519	0.5253X	0.3479
25	Ph50un27	0.0102	0.4579X	-0.444
26	Bs42ke20	0.4183	0.4742X	-0.2252
27	Ms55ke30	-0.1127	0.4595X	-0.4641
28	Bs65ie30	0.3668	0.5710X	-0.0565
29	Ph40un15	0.4442X	0.1191	0.1842
30	Ms58ie30	0.0645	-0.0625	-0.4260X
Number of people in each group		12	11	5

Factor analysis was carried out by principal component analysis and varimax rotation. In total, three factors were identified. Table 2 shows factor loading of the sample (respondents) in three identified factors and their dependence on the factors with an X. The data are highlighted in green for respondents from Jahad-e Agriculture Organization, in blue for those from Regional Water Organization, and in yellow for those from research and academic entities. As can be seen, the software assumes the factor loadings of >0.35 as significant. Accordingly, 12 participants were captured in Factor 1, eleven participants in Factor 2, and five participants in Factor 3. In total, 28 people had determined communalities and two people had undetermined variance.

The correlation between the identified factors is summarized in Table 3, showing weak correlation between them and their relative independence.

Table 3. Correlation between the identified factors

(Reference: Research finding, 2016)

	1	2	3
1	1	0.0448	-0.0623
2	0.0448	1	0.0732
3	-0.0623	0.0732	1

3. THEORETICAL FRAMEWORK

The unique role of water in assuring the welfare and well-being of the society, the need for adequate healthy water availability for all people, the close linkage between economic development and water resources management and development, and the need for showing proper response to growing demands have made the reform in irrigation management structure unavoidable from the optimum governance perspective. While it is essential for designing sustainable water management strategies to understand water resources and their dynamics and exploitation constraints, it is generally believed that the present and future problems are more the result of non-optimal governance than the result of water scarcity (Yousefi, Mozafar Amini, Yadgari, & Fathi, 2013, P. 2).

Water challenge in the 21st century is essentially known as a governance challenge (Rogers & Hall, 2003, P. 15; Teismana, van Buurena, Edelenbos, & Warner, 2013, P. 4; van der Valk & Keenan, 2011, P. 5).

Issues and solutions are more related to social and institutional factors than to the lack of scientific understanding or technology adequacy (De Loë & Kreutzwiser, 2007, P. 85). Water governance is defined as political, social, economic and

administrative systems that are involved directly or indirectly in the exploitation, development and management of water resources and affect water services at all levels of the society (Ashena, 2015, P. 40).

Sustainable water governance requires transformations in current water management regimes (Pahl-Wostl et al., 2008, P. 484) from the changes in strategies and activities, personal-social beliefs and behaviors, and managerial processes to the establishment of a whole new organization and structure within the conventional socio-ecological systems (Medema , Adamowskia, Ort, Wals, & Milot, 2015, P. 2).

In the literature on irrigation management, we frequently see two acronyms – PIM and IMT – which are distinguished in one sense despite of their similarities.

There is one important distinction between PIM and IMT. PIM is characterized with farmers' participation in the management of systems upon which they are dependent. Whether the participation is direct or indirect or whether they are involved as owner or consultant are left open in the definition. The key is the extent of participation without considering a specific form for the participation. IMT is characterized with taking the management away from the government and transferring it to farmers. Whether or not farmers participate in the new form of system management cannot be derived from the concept of IMT (Sinha, 2014, P. 86).

As there are different forms of decentralization, i.e., political, administrative, and financial decentralization, there are different models for irrigation management transfer, too. These models differ in centralization, scale, responsiveness of management unit, and range of functions and the rights of assets transferred to farmers. The initial IMT models (1950-1970) mainly focused on non-poor, market-oriented, large-scale, and semi-commercial agriculture like plantations in the US, Mexico, New Zealand, and Turkey. The objectives of these preliminary models were cutting governmental expenses, improving the operation and maintenance, cost effectiveness, and maintaining/enhancing irrigated farming productivity. Naturally, the government triggered the process and all financial and maintenance functions were transferred to farmers, but the government would keep the ownership. On the contrary, more modern models of IMT (1980 and 1990) focused on poor, small-scale and local market-oriented agriculture in South and Southeast Asia, Latin America and Africa. Though the formal objectives – that is, cutting governmental expenses, improving the operation and maintenance, cost effectiveness, and maintaining/enhancing irrigated farming productivity – are still relevant, even if IMT could merely result in saving on governmental expenses and improvement of its productivity, it would be increasingly considered as a successful event (Eduardo, 2006, P. 21).

The development and learning within the sector, foreign and international pressures induced by international aid bodies (e.g., the World Bank and the Asian Development Bank), and domestic political, economic, and financial concerns are three major drivers of IMT (Suhardiman, 2013, P. 25). The concept of IMT is perceived in two contradictory ways – as a solution for international aid bodies and for reformists as a problem by irrigation agencies.

International aid bodies have developed IMT policy to deal with poor performance of governmental irrigation systems in developing countries. On the other hand, irrigation agencies perceive it as a potential threat to their organizational authority and their existence rationale. They believe that farmers' participation in system management can potentially weaken their decision-making authority.

In Indonesia, irrigation organizations see IMT as a factor that can reduce the extent and level of infrastructure development, put their access to development funds in peril, and threaten their survival (Suhardiman, 2008, P. 237). Overall, irrigation agencies' orientation towards IMT essentially reflects their impulse to protect their own interests and organizational entity (Oorthuizen, 2003, P. 240; Wester, 2008, P. 64).

In international literature, the resistance of irrigation organizations against IMT is often related to 'lack of capability' or 'lack of political will' (Apthorpe, 1986, P. 377). International aid bodies explain the failure of IMT policies with such concepts as 'executive barriers' or the failure in providing the specific conditions required for the fulfillment of IMT. These barriers include the lack of motivation in irrigation organizations to lead management transfer process, inability of water users' association to play their new role in system management, lack of coordination among executive organizations, poor organizational performance of the relevant organizations, and

unclear payments by credit funds to IMT fulfillment (Huppert, Svendsen, & Vermillion, 2001, P. 24). Instead of arguing about reasons for IMT and developing the policies in accordance with them, it is suggested to take corrective actions like redefining the functions of the government and farmers in a clearer way, developing a legal framework for water users, providing the proper conditions of irrigation infrastructure, and assuring strong governmental support (Frederiksen, 1992, P. 14).

4. DISCUSSION

As can be seen in Table 2, Group 1 is the most populated group with twelve members – four managers and experts at irrigation management, two managers and experts at agriculture department, and six academic professors. In other words, academic professors dominate the first group. Among twelve members of this group, eight have Ph.D. degree and four have master's degree. Tables 4 and 5 show the first and last five statements that Group 1 stated their highest and lowest agreement with, respectively.

Table 4. The first five statements that Group 1 stated the highest agreement with
(Reference: Research findings, 2016)

Statement no.	Q-statement	Normalized score	Q-score
34	I think that the lack of preparations and culture-building to found irrigation establishments and impetuous intervention of governmental bodies are the main problem of participatory irrigation resources management.	2.091	+4
19	I think that overlooking the local potentials for participatory management is the main barrier for participatory management of irrigation resources.	1.695	+4
27	I think that the inconsistency between the soul of participatory management and the governance niche of the responsible institutions is the main obstacle to participatory irrigation management.	1.559	+3
25	I think that negative attitudes and the lack of mutual trust between executive organizations and users are the main barriers of participatory management of irrigation resources.	1.497	+3
7	I think that the lack of proper mechanism for coordination between users and executive organizations is the main barrier of participatory irrigation management.	1.468	+3

Table 5. Five last statements that were least agreed upon by Group 1
(Reference: Research findings, 2016)

Statement no.	Q-statement	Normalized score	Q-score
14	I think that the lack of coordination in agricultural support packages is the main barrier against participatory irrigation management.	-1.329	-3
38	I think that the lack of diversity in farmers' income sources is the main obstacle to participatory management of irrigation resources	-1.490	-3
31	I think that following the imported foreign (national and international) models of participatory management of water resources is the main barrier against participatory irrigation management.	-1.512	-3
39	I think that the lack of national water accounting system is the main obstacle to participatory management of irrigation resources.	-1.543	-4
5	I think that the wide area of irrigation and drainage networks is the main barrier against participatory irrigation management.	-1.875	-4

As is evident in Tables 4 and 5, Group 1 regards cultural-organizational issues and problems as the main barriers against participatory irrigation management, so that the lack of preparations and culture-building to find irrigation establishments of water management and impetuous intervention of the institutions responsible for forming and organizing the associations while overlooking the cultural grounds alongside the inadequate reliance on local potentials for participatory management were mentioned as the main obstacles for the realization of participatory irrigation management

and were scored +4 in Q-ranking. Higher normalized score of the first factor (2.091) reflects its higher priority than the second factor with normalized score of 1.965.

The next ranks were devoted to inconsistency between participatory management and the governance niche of the responsible institutions, the lack of mutual trust between executive organizations and users, and the lack of proper mechanism for their coordination and cooperation, which were ranked the third to fifth. On the other hand, table 5 indicates that the factors least agreed upon by Group 1 are the obstacles to participatory irrigation management including the lack of coordination in agricultural support policies, the lack of diversity in farmers' income sources, and the lack of a domestic model for participatory management.

Group 2 with eleven members was composed of six managers and experts at agriculture department, three managers and experts at irrigation management, and two academic professors. Three members had Ph.D. degree, five had master's degree, and three had bachelor's degree.

Table 6 shows the first five statements upon which the members of Group 2 expressed their most agreement. As these statements unmask, this group believes that technical and executive barriers are more important than cultural issues so that they impose the main constraints on the realization of participatory irrigation management. Indeed, the weariness of irrigation infrastructure and networks was ranked the first with the score of +4 in Q-ranking and 1.715 from normalized scores. The second most important factor was stated to be the predominance on political attitude over economic attitude towards irrigation management with Q-ranking of +4 and normalized score of 1.495. The lack of proper mechanism for coordination between executive organizations and users, the lack of their mutual trust, and the failure to create the cultural bases for the establishment of associations were ranked the next with Q-score of +3 in this group.

Table 6. Five first statements upon which the members of Group 2 expressed the most agreement
(Reference: Research findings, 2016)

Statement no.	Q-statement	Normalized score	Q-score
18	I think that depreciation of infrastructure, weariness and quality loss of irrigation and drainage networks is are the main barriers against participatory irrigation management.	1.715	+4
22	I think that the predominance of political attitude over economic attitude towards water is the main obstacle for participatory irrigation management	1.495	+4
7	I think that the lack of proper mechanism for coordination between users and executive organizations is the main barrier of participatory irrigation management.	1.361	+3
34	I think that the lack of preparations and culture-building to found irrigation establishments and impetuous intervention of governmental bodies are the main problem of participatory irrigation resources management.	1.275	+3
25	I think that negative attitudes and the lack of mutual trust between executive organizations and users are the main barriers of participatory management of irrigation resources.	1.175	+3

Statements that were least agreed by Group 2 are presented in Table 7. Accordingly, the members of this group expressed their least agreement with the role of national water accounting system and the dominance of technical approaches like the construction of numerous dams and excessive digging of wells as the barriers against participatory irrigation management. These factors, both, got the Q-score of -4 with their difference lying in their normalized scores of -2.141 and -1.905, respectively. The next ranks were devoted to factors like the lack of domestically designed model of participatory management, the weaknesses of expertise body and the lack of financial support by Agribank. The members of this group did not agree with the limiting role of these factors in the realization of participatory irrigation management, so that they had almost same Q-scores and normalized scores.

Table 7. Five last statements least agreed upon by the members of Group 2
(Reference: Research findings, 2016)

Statement no.	Q-statement	Normalized score	Q-score
31	I think that following the imported foreign (national and international) models of participatory management of water resources is the main barrier against participatory irrigation management.	-1.401	-3
21	I think that expertise poorness and the lack of experienced, accountable people in the organizations in charge are the main barriers to participatory irrigation management.	-1.421	-3
29	I think that the lack of financial support of participatory projects by Agribank is the most important barrier to participatory irrigation management.	-1.443	-3
36	I think that the dominance of technical approach like the construction of numerous dams and the excessive digging of wells are the main obstacles to participatory irrigation management.	-1.905	-4
39	I think that the lack of national water accounting system is the main obstacle to participatory management of irrigation resources.	-2.141	-4

Finally, we had Group 3 that was relatively smaller than the other two groups. It was composed of two irrigation management experts, two academic professors and one agriculture experts, among which three had Ph.D. degree and two had master's degree. According to the results, it can be asserted that this group believes that educational-cultural barriers play the most critical role in preventing the realization of participatory management. As shown in Table 8, the lack of preparations and culture-building to find irrigation establishments and the impetuous intervention of governmental bodies as well as the weaknesses of formal and informal educational system about participatory management are the most important factors that, according to this group, play the most important role in constraining participatory irrigation management. They acquired Q-score of +4. The slight difference in the normalized scores of these two statements shows that their priorities for the members of this group were very close to each other. The lack of consultation with users, the weakness of communication and culture-building among farmers and experts, and ambiguities about the role of stakeholders in participatory irrigation management are the factors ranked the next.

Table 8. Five first statements upon which the members of Group 3 expressed the most agreement
(Reference: Research findings, 2016)

Statement no.	Q-statement	Normalized score	Q-score
34	I think that the lack of preparations and culture-building to found irrigation establishments and impetuous intervention of governmental bodies are the main problem of participatory irrigation resources management.	1.778	+4
33	I think that the weak formal and informal educational system is the main challenge for participatory irrigation management.	1.679	+4
35	I think that the lack of consultation with users about how to delegate water authority is the main barrier against participatory management of irrigation resources.	1.416	+3
32	I think that weak communication and culture-building programs for farmers and experts are the main challenges for participatory irrigation management.	1.195	+3
28	I think that ambiguities about the role of stakeholders in participatory irrigation management are the main problem of participatory management of irrigation resources.	1.128	+3

It can be said from Table 9 that centralized planning and the lack of appropriate mechanism for the coordination of executive agencies have the least important role in preventing the realization of participatory irrigation management with Q-scores of -4 from Group 3's perspective.

Among these two statements, centralized planning that had lower normalized score was less important. The lack of convergence and coordination among contractors, consultants and users, the weak structure and poor performance of responsible agencies, and the weaknesses of judiciary and legislative bodies in institutionalizing participatory irrigation management were ranked the third through the fifth in the list of least important limiting factors of participatory irrigation management

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Table 9. Five last statements least agreed upon by the members of Group 3

(Reference: Research findings, 2016)

Statement no.	Q-statement	Normalized score	Q-score
2	I think that the weaknesses of judiciary and legislative bodies in institutionalizing participatory irrigation management are the main obstacles to participatory management of irrigation resources.	-1.186	-3
23	I think that the main challenges of participatory management of irrigation resources are the weak structure and poor performance of the responsible executive organizations like Regional Water Organization and Jahad-e Agriculture Organization.	-1.214	-3
41	I think that the lack of convergence and coordination between contractors, consultants, supervisors and users are the main barriers against participatory management of irrigation.	-1.257	-3
6	I think that the lack of an appropriate mechanism for coordination between governmental agencies is the main obstacle to participatory irrigation management.	-1.885	-4
16	I think that centralized planning system of irrigation management is the barrier against participatory management of irrigation resources.	-2.659	-4

5. CONCLUSION

FAO's tabulation of managerial reforms in 43 samples from 33 countries of five continents of the world shows that irrigation management transfer process is very complicated and broad. Therefore, it is always possible to have the process done imperfectly or to fail in realizing a part of the objectives. Some drawbacks and key warnings in irrigation management transfer can be listed as neglecting the need for constant scientific support and consulting services, the inadequate financial capacity for continuous reforms, the requirements of network improvement due to deteriorated status of the irrigation infrastructure and so on (Heidarian, Taleshi & Alinezhad, 2011). Therefore, we used Q methodology to analyze experts' attitudes to the challenges of irrigation management transfer to users. Accordingly, three categories were distinguished among experts. Table 10 presents the main differences in Q-scores among three groups. It can be said that the main distinction in the scores gained from three groups is rooted in their jobs, their perspective and the challenges they face. Thus, a combination of the effective components derived from their attitudes can be the best solution to deal with participatory irrigation management while the field studies and the review of literature show that it has been completely overlooked.

Table 10. Scores of statements with the highest differences among three groups in Q-ranking (Reference: Research findings, 2016)

Code	Q-statement	Score in Group 1	Score in Group 2	Score in Group 3
36	The dominance of technical approach like the construction of numerous dams and the excessive digging of wells are the main obstacles to participatory irrigation management.	0	-4	2
6	The lack of an appropriate mechanism for coordination between governmental agencies is the main obstacle to participatory irrigation management.	1	1	-4
25	Negative attitudes and the lack of mutual trust between executive organizations and users are the main barriers of participatory management of irrigation resources.	3	3	-2
18	Depreciation of infrastructure, weariness and quality loss of irrigation and drainage networks are the main barriers against participatory irrigation management.	-2	4	0
16	Centralized planning system of irrigation management is the barrier against participatory management of irrigation resources.	2	-2	-4

Table 10 summarizes the main divergences in three expert groups' attitude to participatory irrigation management. Accordingly, the main distinguishing component of their attitudes is the negative attitude and mutual distrust between executive organizations and users in Group 1, the depreciation of infrastructure, weariness and quality loss of irrigation and drainage network in Group 2, and the predominance of technical approach like the construction of numerous damps and the uncontrolled digging of wells in Group 3.

Since Q methodology tries to reject positivism rather than focusing on the discovery of an objective reality, social issues can have different realities from different individuals and groups' viewpoints, then, we accept that the challenges prioritized by three studied groups are key factors in realizing participatory irrigation management and each group has scrutinized and prioritized them on the basis of its unique knowledge, vision and attitude to the issue in question.

So, whilst the priorities that were commonly stressed out by all three groups would be helpful, it would be imperative to address the distinctive priorities derived from the differences in their attitudes, too.

Hence, it can be observed that the group dominated by academic professors acknowledges the cultural-organizational challenges as the main barriers to participatory irrigation management (e.g., the lack of preparations and culture-building to find irrigation management establishments, impetuous intervention of governmental bodies in charge of organizing the associations without considering the cultural grounds, and the insufficient use of local potentials).

Group 2 was the group of executive experts dominated by the experts of the Ministry of Agriculture. They suggested that technical and executive barriers played more effective role than the cultural barriers in challenging the irrigation transfer to users (e.g., the depreciation of infrastructure, weariness and quality loss of irrigation and drainage networks, predominance of political attitude over economical attitude towards water, the lack of a proper mechanism for coordination between users and executive organizations).

Finally, the third group that was smaller than the other two groups believes that the main challenge to participatory irrigation management rises from educational-cultural issues. They agree that the lack of preparations and culture-building to find irrigation associations and the impetuous intervention of governmental bodies, the weak formal and informal educational system in the field of participatory management, the lack of consultation with users about how to delegate water authority, weak communication and culture-building programs for farmers and experts, and ambiguities about the role of stakeholders are the main obstacles to the realization of participatory irrigation management.

According to the results, the following recommendations can be drawn to facilitate and strengthen the process of transition to participatory irrigation planning:

1. The priority of preparations and culture building over the fulfillment of participatory irrigation management because numerous literature shows that the change occurs inside the system and that dictating the decisions taken at macro level and neglecting the adoption at different layers of the society is not only unstable, but it may also have reverse impacts.
2. Revising the governance structure of the Ministry of Energy towards the transfer of irrigation management, the adjustment of job positions, and the determination of new job descriptions for people whose roles have lost their importance and who have no role at all. It is imperative to make efforts to motivate development agents because a government's potential to create institutions with harsh developmental tasks relies upon policy-makers and officials' motives at national and local levels. When the policy-makers are encouraged to institutionalize and the senior officials may not be able to hinder the political reform process, then a government can develop the political framework for the collaboration of private and public sector.
3. Comprehensive, stable and intermittent capacity building and institutionalization for participatory irrigation management and the utilization of local potentials, highlighting the role of *Dehyar*'s and Islamic Councils of villages by non-governmental organizations of province governorships. The transfer of water management is a gradual, time-consuming process, requiring long-term planning. Therefore, capacity building and institutionalization in people and society via appropriate trainings and the use of successful global experiences can play a decisive role.
4. Developing a clear, applied guideline to use the opinions of the studied three groups of effective people (in the Ministry of Energy, Ministry of Jahad-e Agriculture, and academia) about the executive, advisory and supervisory mechanisms and determining their job descriptions in accordance with their executive, advisory and supervisory responsibilities.
5. Informing and familiarizing farmers with governmental policies and objectives, global and national water crisis, requirements for irrigation management transfer to farmers, and the principles and objectives of irrigation foundations and associations.
6. Restoring and enhancing farmers' trust to governmental agencies by holding intimate meeting and above all, by avoiding scattered works and leaving participatory projects unfinished, especially water users associations – no successful example of these associations has been seen in Guilan Province, yet.
7. Improving and rehabilitating irrigation and drainage facilities by national, provincial, and local resources; selecting the optimum between rehabilitation, enhancement and renewal of irrigation and drainage systems.
8. Changing the attitude towards water from a political commodity to an economic commodity.
9. Conducting pilot projects of irrigation management transfer at local level using the current governance potentials (like *Mirab's*) that, according to our observations, had a good record in attracting rural people's cooperation. The continuous monitoring of these pilot studies and their planned expansion to other apt villages in case of their success and sustained performance.
10. Avoiding frequent changes of organizations in charge of fulfilling participatory irrigation management. Field studies revealed that the responsibility of the projects of participatory irrigation management used to be on Regional Water Organization. Then, it was delegated to the Organization of Jahad-e Agriculture and soon after that, to Rural Cooperative Organization.
11. Clarifying and reinforcing the regulations concerning the violations of natural resources (including irrigation water), and reinforcing and supporting judiciary and legislature about institutionalizing participatory management.
12. Defining measures for economic need assessment of irrigation associations; planning and allocating finance and credit to the responsibilities delegated to users; establishing the office of irrigation management transfer in main branches of Agribank to facilitate low-interest financial payments to newly founded

associations; and allocating governmental budget to motivate local investments.

13. Formulating mechanisms for the assessment of farmer's systems and their documentations.

References

1. Ahmad Ali, J., Abbasi, N., Heidari, N., Khani, J., Hamedi Asl, M. … Narimani, Y. (2010). *Investigating the reluctance reasons of farmers in establishing WUAs (Case study: Miyandooab plain)*. The final report of the research project. The Ministry of Agriculture. [In Persian]
2. Apthorpe, R. (1986). Development policy discourse. *Public Administration and Development*, *6*(4), 377-389.
3. Arun, G., Singh, D. R., Kumarc, S., & Kumard, A. (2012). Canal irrigation management through water user's associations and its impact on efficiency, equity and reliability in water use in Tamil Nadu. *Agric. Econ. Res. Rev*, *25*, 409–419.
4. Ashena, H. (2015). Water crisis or the crisis of governance. *Shargh Newspaper*, pp. 40-45. [In Persian]
5. Bezi, K., Khosravi, S., Javadi, M., & Hosseinnezhad, M. (2010). *Water crisis in the Middle East: Challenges and solutions.* Paper presented at the Fourth International Congress of Islamic World Geographers, Zahedan, Iran. [In Persian]
6. Cave, K. (2012). *Exploring the influences of institutions on water governance and management (A first nation case study)*. Unpublished master's thesis, University of Waterloo, Ontario, Canada.
7. De Loë, R., & Kreutzwiser, R. (2007). *Challenging the status quo: The evolution of water governance in Canada.* In K. Bakker (Ed.), *Eau Canada: The future of Canada's water* (pp. 85-103). Vancouver: UBC Press.
8. Eduardo, K. A. (2006). *Decentralization puzzles: A political economy analysis of irrigation reform in the Philippine*. Unpublished doctoral dissertation, The School of Public and Environmental Affairs and Department of Political Science, Indiana University, Indiana.
9. Facon, T. (2007). *Performing irrigation and participatory irrigation management: Lesson from FAO irrigation modernization program.* Retrieved 5 July 2016 from www.vncold.vn/Modules/CMS/Upload/13/Documents/...19.../PIMfaconEW.pdf
10. Frederiksen, H. D. (1992). *Water resources institutions: Some principles and practices*. Washington, DC: The World Bank.
11. Garces-Restrepo, C. D., Vermillion, D. L., Munoz, G., Renault, D., & Samand, M. (2007, May). *Irrigation management transfer: Worldwide efforts and results*. Paper presented at the 4th Asian Regional Conference of ICID and 10th International Seminar on Participatory Irrigation Management, Tehran, Iran.
12. Garces-Restrepo, C. D., Vermillion, D. L., & Munoz, G. (2007). Irrigation management transfer: Worldwide efforts and results. *FAO Water Report No. 32*.
13. Ghanaat, M., Mamanpoush, A., & Aghababaie, M. (2013). Investigating observed necessities to start preparatory activities related to participatory irrigation management in Abshar network of Zayanderoud river. *Journal of Irrigation and Drainage, 1*(7), 1-9. [In Persian]
14. Ghenyan, M., Baradaran, M., Mirzaie, E., Soleimani Harooni, K., & Pasha, S. (2013). Participatory management of agriculture water resources, and the factors affecting it. *Journals of Water Research in Agriculture, 27*(2), 181-190. [In Persian]
15. Gomo, T., Mudhara, M., & Sensanje, A. (2014). Farmers' satisfaction with the performance of the Mooi river irrigation scheme, KwaZulu-Natal, South Africa. *Water SA, 40*(3), 1–10.
16. Heidarian, S., & Eslami, M. (2009, February). Exogenous changes in the traditional agriculture management and farming system program structure in irrigation development projects (Case study: Dams and irrigation networks of Balakhanloo). *Paper presented at the Second National Conference of Experiences in the Construction of Water Utilities and Irrigation and Drainage Networks*, Tehran, Iran. [In Persian]
17. Heidarian, S., Taleshi, M., & Alinezhad, M. (2011). The effects of irrigation management transfer on users' satisfaction and improving the management of irrigation network (Moghan plain). *Journal of Irrigation and Drainage*, *2*(5), 186-192. [In Persian]
18. Heidery, N., Heidarian, S., Hashemi, R., Karamati, M., & Alimohammadi, R. (2009). Socio-economic and policy-institutional discussions on improving the efficiency of agricultural water. *The final report of the research project*, the Ministry of Agriculture. [In Persian]
19. Hosseini, S., Behjaty Ardekani, B., & Rahmani, S. (2011). Identifying the mentality of people towards Iran's privatization policies (Policies of article 44 of the Constitution). *Quarterly of Business Administration Studies, 3*(6), 51-74. [In Persian]
20. Huppert, W., Svendsen, M., & Vermillion, D. L. (2001). *Governing maintenance provision in irrigation.* Eschborn: Deutsche Gesellshaft für Technische Zusammenarbeit.

21. Lemoine, N. R. (). *Exploring water governance in northern Saskatchewan: Opportunities for a watershed council* (Unpublished master's thesis). University of Saskatchewan,
22. Medema, W., Adamowski, J., Orr, C. J., Wals, A., & Milot, N. (2015). Towards sustainable water governance: Examining water governance issues in Québec through the lens of multi-loop social learning. *Canadian Water Resources Journal/Revue canadienne des ressources hydriques*, *40*(4), 373-391.
23. Mobareki, M., Zali, M., & Dehnad, R. (2013). Identifying organizational barriers to entrepreneurial behavior in aviation organization of Islamic Republic of Iran, based on Q Methodology. *Quarterly of Cultural Management*, *11*(1), 5-32. [In Persian]
24. Mohammadi Tamary, Z., Ahmadvand, M., & Ghasemi, S. (2013). Farmers' attitudes about changing the cropping pattern of rice to citrus. *Iranian Journal of Agricultural Extension and Education*, *9*(2), 89-106. [In Persian]
25. Mortezanezhad, M., Yaghoobi, J., Sotoodenia, A., & Daghestani, M. (2014). Factors affecting the success of Qazvin irrigation network management transfer to the private sector. *Journal of Water Research in Agriculture*, *28*(1), 183-190. [In Persian]
26. Muchara, B., Ortmann, G., Wale, E., & Mudhara, M. (2014). *Collective action and participation in irrigation water management: A case study of Mooi river irrigation scheme in KwaZulu-Natal Province, South Africa*. Retrieved from http://www.wrc.org.za
27. Najafi, B., & Shirvanian, A. (2006). Investigating the barriers to the participation of water users in irrigation and drainage networks management. *Quarterly of Village and Development*, *9*(3), 53-75. [In Persian]
28. Oorthuizen, J. (2003). *Water, works and wages: The everyday politics of irrigation management reform in the Philippines* (Unpublished doctoral dissertation). Wageningen University, the Netherlands.
29. Pahl-Wostl, C. D., Tabara, R., Bouwen, M., Craps, A., Dewulf, … Taillieu, T. (2008). The importance of social learning and culture for sustainable water management. *Ecological Economics*, *64*, 484–495.
30. Perret, S. (2002). Water policies and smallholder irrigation schemes in South Africa: A history and new institutional challenges. *Water Police*, *4*(3), 282–298.
31. Rahimi Feizabad, F., Yazdanpanah, M., Foroozani, M., Mohammadzadeh, S., & Boorten, R. (2014). The relationship between social capital and the willingness of farmers to membership in the WUA (Alashtar). *Journal of Agriculture and Cooperatives*, *3*(12), 76-95. [In Persian]
32. Rogers, P., & Hall, A. (2003). *Effective water governance.* Retrieved 25 April 2016 from www.gwp.org/.../07%20effective%20water%20governance.
33. Sinha, P. (2014, November). *Sustainability issues in participatory irrigation management (PIM) in India.* Paper presented at the National Convention of Presidents of Water User Associations organized by MOWR RD & GR, India NPIM at Delhi. Retrieved from wrmin.nic.in/writereaddata/PIM11.pdf
34. Suhardiman, D. (2008). *Bureaucratic designs: The paradox of irrigation management transfer in Indonesia.* Unpublished doctoral dissertation, Wageningen University, The Netherlands.
35. Suhardiman, D. (2013). The power to resist: Irrigation management transfer in Indonesia. *Water Alternatives*, *6*(1), 25-41. Retrieved 30 March 2016 from www.wateralternatives.org/index.php/volume6/v6issue1/197-a6-1-2/file.
36. Teisman, G., Van Buuren, A., Edelenbos, J., & Warner, J. (2013). Water governance: Facing the limits of managerialism, determinism, water-centricity, and technocratic problem-solving. *International Journal of Water Governance*, *1*, 1–11.
37. Van Der Valk, M., & Keenan, P. (2011). *Principles of good governance at different water governance levels.* Retrieved 30 April 2016 from https://www.unesco.nl/sites/default/files/dossier/water_governance.pdg_.pdf
38. Wang, H. (2013). *Challenge and opportunities for source water protection plan implementation in Saskatchewan: Lessons for capacity building.* Unpublished master's thesis, University of Saskatchewan,
39. Wester, P. (2008). *Shedding the waters: Institutional change and water control in the Lerma-Chapala basin, Mexico*. Unpublished doctoral dissertation, Wageningen University, The Netherlands.
40. Yaghoobi, J. (2009, May). *A model for public participation in water resource management.* Paper presented at the Second National Conference on the Effects of Drought and its Management Solutions, Research Center for Agriculture and Natural Resources, Isfahan, Iran. [In Persian]
41. Yousefi, A., Mozafar Amini, A., Yadgari, A., & Fathi, O. (2013, February). *Evaluating the sustainable water governance components in Zayanderood river management.* Paper presented at the Fifth Conference on Water Resources, Tehran, Iran. [In Persian]