

IMPROVING IRRIGATION AND DRAINAGE MANAGEMENT TO ENHANCE WATER PRODUCTIVITY (CASE STUDY: SOUTH AND EAST WATER SHED BASIN PLANS OF IRAN)

AMELIORATION DE LA GESTION D'IRRIGATION ET DE
DRAINAGE POUR AUGMENTER LA PRODUCTIVITE DE
L'EAU (ETUDE DE CAS : BASSINS VERSANTS DU SUD
ET DE L'EST DE L'IRAN)

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ABSTRACT

High water consumption in agriculture and low efficiency of irrigation make it imperative to focus on and improve irrigation and drainage management to increase crop water productivity. In this study, the most important challenges in improving management of irrigation and drainage has been studied to increase water productivity in irrigation and drainage network. These challenges include: 1-Partnership and water users views in decision-making, performance and operation process; 2-Identification and management of virtual water and 3- conjunctive management of surface and groundwater resources under different operating conditions.

Key words: Irrigation and drainage management, water productivity, virtual water, conjunctive water use.

RESUME ET CONCLUSIONS

La forte consommation d'eau dans le secteur agricole et la faible efficacité de l'irrigation et l'irrigation et de drainage rôle de gestion afin d'accroître la productivité de l'eau montre. Dans cette étude, les défis les plus importants dans l'irrigation et l'amélioration de la gestion du drainage pour augmenter la productivité de l'eau dans le réseau d'irrigation et de drainage a été étudié:

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1. *Créer des vues et la participation des usagers de l'eau dans le processus décisionnel, la mise en œuvre et l'exploitation*
2. *Identification et gestion de l'eau virtuelle*
3. *La gestion intégrée des eaux de surface et souterraine des ressources en eau sous-utilisation différents*

Avec la participation des agriculteurs dans l'objet de développement des réseaux d'irrigation et de drainage et de leur participation dans les affaires d'exploitation de poste et de gestion de réseau, les associations agricoles appropriées en la forme établie en termes de la législation pertinente a été. Mais l'un des principaux problèmes dans la gestion des programmes de transfert que les agriculteurs ne croient pas à ce processus ont été sous-estimée et la participation à la résolution des problèmes des deux côtés (les utilisateurs du gouvernement et de l'eau) ne sont pas dans une condition équivalente. Sous réserve de participation doit coordonner avec les intérêts des participants et des besoins des agriculteurs dans tous les domaines liés à l'agriculture et de leur gagne-pain est en marche. Dans cette étude, le nombre de projets d'irrigation et de drainage en cours d'exécution en Iran, des ateliers de consultation à reconnaître les problèmes, les opinions et la participation des usagers de l'eau dans la prise de décision et de mise en œuvre de processus et l'utilisation du projet a eu lieu. En outre, pour proche conseiller de l'avis d'experts, le rôle des institutions communautaires locales de ressources et de faciliter entre les parties Gray a été payée.

De nombreux pays arides et semi-aride avec des importations de produits alimentaires, qui fait partie de l'eau pour la production nationale est nécessaire pour les produits utilisés dans d'autres applications sont conservées. Pendant ce temps, l'identification et la gestion de l'eau virtuelle peut être optimisé en utilisant les ressources internes et le rôle des capacités pour accroître la productivité de l'eau a la base de la production agricole a augmenté de façon spectaculaire. Dans cette étude, étant donné les besoins de développement croissant et la nécessité d'identifier et de gérer les exigences de base de l'eau virtuelle dans l'irrigation et la gestion de drainage dans un certain nombre de projets d'irrigation et de drainage en cours d'exécution dans différentes parties de l'Iran sont à l'étude.

Les problèmes des basses-eaux dans les zones arides et semi-arides des ressources en eaux souterraines nécessaires pour rendre inévitable. Dans cette étude, des ateliers de consultation et de participation des agriculteurs dans l'évaluation et la gestion intégrée de la surface et les eaux souterraines exploitation des ressources dans cette situation et de prévoir la méthode appropriée dans le plan de gestion intégrée avenir a été discuté et finalement les meilleurs candidats pour améliorer la productivité de l'eau permet d'accroître a été.

Mots clés : *Gestion d'irrigation et de drainage, productivité de l'eau, eau virtuelle, usage combinée de l'eau.*

(Traduction française telle que fournie par les auteurs)

1. INTRODUCTION

Investigating and explaining the irrigation and drainage management indicators and their ability to define the status of a system to the system users is important. This applies to the Irrigation

and Drainage network systems in Iran. Without a proper understanding of the concept and relevance of such indicators, strengthening the network infrastructure with more and more interventions will not succeed in getting the desired benefit from such net works. There are different views on irrigation and drainage network management and each one comes with challenges to increase the productivity in agriculture.

2. VIEWS AND CHALLENGES OF IRRIGATION AND DRAINAGE MANAGEMENT IMPROVEMENT

2.1. Partnership and water users views in decision-making, performance and operation process

Improvement in the design, operation and maintenance of the Irrigation and Drainage Networks requires participation of the farmers with the subject matter specialists and the concerned government departments. Appropriate legislations are also needed to strengthen the process of involvement of the stake holders in the above effort. However, one of the main problems in Management transfer programs is the lack of farmers' conviction that such an institutionalized involvement will do them any good.

Participation is defined as organized efforts to increase control over resources and regulatory institutions in certain social conditions by some groups and movements. In the so far government controlled endeavours, the stake holders are usually kept away from the decision making process and this alienates them to the extent that they do not feel enthused to manage the system. The government also finds it difficult to arrange for adequate logistics and funds for system operation, management and time to time performance evaluation. The result is a gradual deterioration of the created assets at a high cost that fails to deliver the desired results.

In this study, consultative workshops were held in a number of irrigation and drainage projects to recognize the problems, water users' views on participation in decision-making, performance and operation process of the plan. For this purpose the watershed Basin plans of South and East (Iran) was considered as the study area. Members of water users' organizations were identified before conducting the workshops. In these workshops, the agricultural operators' views on issues related to groundwater and surface water supply, operation system in the present situation and future conditions, water pricing, etc., were discussed.

The differing views of the stake holders and the current system operators were reconciled by explaining the benefits and the shortcomings of each other group's domain of activities vis-à-vis the fact that both the groups have the same common objective of improving the system operation and performance but differences in their approach to achieve the objective. In addition to holding workshops, the views were also gathered through questionnaire survey from the stake holders and report processed by analyzing the responses in the questionnaire was made available to the system operators.

The questionnaire included questions about the personal characteristics of respondents, system of operating in the current situation, provide new options based on water users comments, system of operating in the current conditions of the plan and how to administer the new plan options, cultivation composition and extent of cultivated land. In the plans of

south and east (Iran), organizing water users is based on village or rivers, or a combination of the two.

The steps towards institutionalizing participatory water management in the Irrigation and Drainage Networks, started with the main inputs as mentioned above and it culminated in agreement on the improved plan and its map, membership and financial participation of the water users, volumetric water supply, conducting the first session of the General Assembly of the representatives, adoption of the Statutes, selection of Board and Managing Director of organizations, empowerment of the member organizations for participating in regional visits and courses.

2.2. Identification and management of virtual water

Water in various stages of producing a commodity for example, crops, is called virtual water if the use of water and the production has not actually taken place. Today, many countries of arid and semi arid regions import agricultural products and save the water that would have been used if the products were actually produced in the country. The water thus saved is available for use for other purposes, which may be more important and offer a better water productivity. Therefore, identification and management of virtual water has a close relationship with the food security of this country.

Water resources projects in South and East (Iran) show considerable heterogeneity. In this case the exchange of virtual water in adjacent zones can lower costs by spending the bulk of the problems to solve water distribution system.

Evaluation of current real water flow rate and calculation of the productivity of this water will represent the importance of identifying and managing virtual water.

In this regard, training and involving appropriate organization for regional trade and regional virtual water should be the answer how to ensure more productivity of the available water resources in each region.

2.3. Conjunctive management of surface and groundwater water resources under different operating conditions

Increased water demand due to population growth and expanding industrial and agricultural activities has created significant challenges for water resource planners and managers. Approach of conjunctive use of surface and groundwater resources will ensure optimal utilization of resources In order to solve water needs and quality management systems to achieve sustainable development.

The diversity of agricultural water resources, diversity of access to agricultural water resources, diversity of exploitation of agricultural wells, etc., were studied in some of the plans in South and East (Iran). Following the study, the conjunctive of ground and surface water resources management plans were developed.

3. CONCLUSIONS

In the evaluation of Irrigation and Drainage Management, Definition of indicators with capable of measuring and evaluating is important.

These indicators are not achieved only from field operations in farm but also it is necessary to define the structure and capacity development, especially, in section of administrative Management. However there is a need be followed recognizing the challenges in each period but for access to landscapes predicted it is necessary to Program planning and continuous and investment in fundamental sectors and effective human resources training and being equipped with the modern knowledge

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