

Full Length Research Paper

Evaluation of the program of transfer of irrigation in the Kahramanmaras Irrigation Scheme

Cagatay Tanriverdi* and Hasan Degirmenci

Department of Agricultural Structures and Irrigation, Faculty of Agriculture, Kahramanmaras Sutcu Imam University, 46100, Kahramanmaras, Turkey.

Accepted 04 March, 2018

In this study, the program of management transfer of the Kahramanmaras Irrigation Scheme was evaluated. The result of effects on water use and agricultural effectiveness were determined using appropriate performance indicators and the opinions of farmers. According to the results, the transfer process was not profitable for farmers; on the other hand, governmental expenditures were decreased. Farmers had insufficient knowledge of the transfer of irrigation management. Farmers did not understand the transfer of management, which indicates that one of the major aims of the transfer program - farmer participation - failed. Thus, the transfer program had no effect on indicators of water use efficiency such as sufficiency, equality, and irrigation time; it had negative effects on maintenance and operation of irrigation and drainage channels.

Key words: Irrigation, irrigation management, irrigation system performance, water use efficiency.

INTRODUCTION

Water shortage, which is further increased by inefficient water use, is one of the most serious global problems (Rey et al., 2007). In this era, water shortages concern all countries in terms of sustaining domestic agriculture and crop production (Khairy et al., 2001). The increase in food need of the growing world population can only be met by enhancing processes of sustainable agricultural production. Today, making efficient use of finite soil and water resources requires improving, monitoring and evaluating these resources. Considering technical and economic conditions, it is estimated that Turkey has approximately 8.5 million hectare of potentially irrigable land. As of 2007, approximately 5.1 million hectare of land has been opened to irrigation, following individual initiatives and public investment (Anonymous, 2008). Despite all these investments, irrigation projects failed to realize the predicted benefits, even a long time after the construction of these systems. This causes health, social and environmental problems in irrigation project areas.

It was observed that the performance of many irrigation

systems, particularly in developing countries, is far below their potentials. The failure to derive the expected benefit from irrigation projects is caused by the lack of an effective system of irrigation management, rather than problems in planning, project developing and construction (Rieser et al., 1994). Therefore, in many countries, experts, project managers, national planners and decision-makers discuss the dilemma of whether to develop new irrigation projects or to improve the performance of existing projects, using an effective irrigation method.

Irrigation managers should have enough knowledge to make necessary and accurate decisions about increasing costs (Visitacion et al., 2009). The natural and social sciences should provide the input required to strengthen and manage natural resources (de Lange et al., 2010). Since irrigation has a socio-political importance, federal, state and local agencies should be involved in the management of such projects (Douglas, 2009). In recent years, developing countries in particular, have conducted various studies on this subject. Within the framework of these studies, local people were informed about programming, operation and management of rural water needs (Whittington et al., 2009; Hughes and Mallory, 2009; Juizo and Hjorth, 2009).

*Corresponding author. E-mail: ctanriverdi@ksu.edu.tr. Tel: +905325599469. Fax: +903442191526.

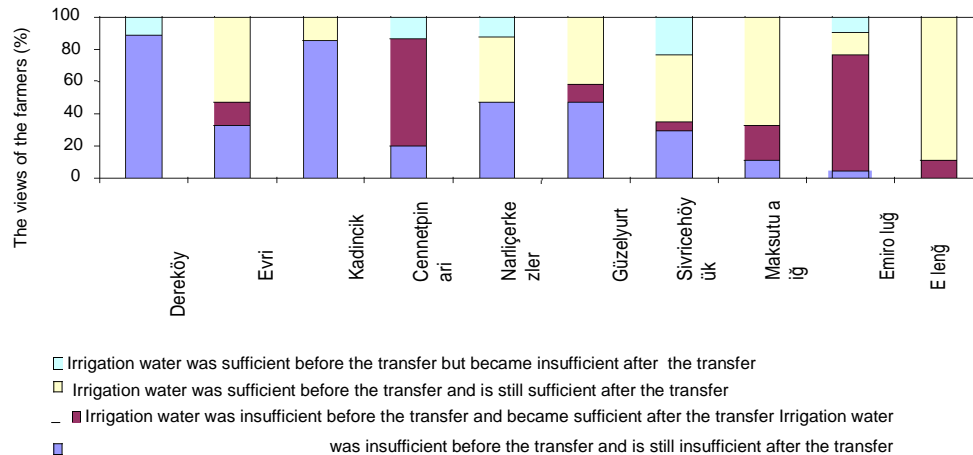


Figure 1. Farmers' status on receiving sufficient irrigation water.

The aim of the present study was to determine the effectiveness of the program of transfer of irrigation in the Kahramanmaraş Irrigation Scheme. The views of local farmers about the program of management transfer were collected using a questionnaire. Questionnaire data were used to determine the effects of the program of management transfer on the success of water distribution criteria, such as sufficiency, equality, and safety of the program.

MATERIALS AND METHODS

Materials

Study area is located in the southeast of Kahramanmaraş province, starting in the southeast part of the provincial center and extending to Pazarcık district. The study area is known as Kahramanmaraş irrigation area. Irrigation water is supplied from Kartalkaya Dam. Kahramanmaraş irrigation was conducted by State Hydraulic Works and was commissioned between the years of 1973 to 1975, and was intended to serve an area of 20.970 ha (Anonymous, 2004).

Methods

Determination of the success of water distribution

Four indicators were used to determine the success of water distribution: Sufficiency, equality, trust towards the irrigation association and the timing of irrigation. The questionnaires administered to farmers were used in determining the indicators (Değirmenci, 1997; Molden et al., 1998; Vermillon et al., 1999).

RESEARCH RESULTS

The success of water distribution

Sufficiency

Farmers were asked four questions to determine the sufficiency of water distribution before and after the

transfers. The amount of water received from the irrigation scheme and farmers' utilization of water in drainage channels and ground water were evaluated. In addition, the possibility of farmers irrigating at night was also evaluated. Figure 1 shows farmers' views on receiving sufficient water from irrigation channels.

Figure 1 indicates that 37.1% of the farmers who were contacted in the study area reported that the water they received was sufficient for their needs both before and after the transfer; 7.3% reported that they received insufficient water both before and after the transfer. A total of 31.8% of farmers reported that the water they received was sufficient before the transfer but became insufficient after the transfer. A total of 23.8% of farmers reported that they received insufficient water before the transfer but sufficient water after the transfer.

Figure 1 indicates that 37.1% of the farmers who were contacted in the study area reported that the water they received was sufficient for their needs both before and after the transfer; 7.3% reported that they received insufficient water both before and after the transfer. A total of 31.8% of farmers reported that the water they received was sufficient before the transfer but became insufficient after the transfer. A total of 23.8% of farmers reported that they received insufficient water before the transfer but sufficient water after the transfer.

Equality

Figure 2 shows the views of the farmers about the fair distribution of water before and after the transfer. It is understood from the results that 35.1% of the farmers reported that there was no fair water distribution before the transfer, while 33.1% reported that water distribution was fair before the transfer but became unfair after the transfer. A total of 22.5% of farmers reported that water was fairly distributed both before and after the transfer,

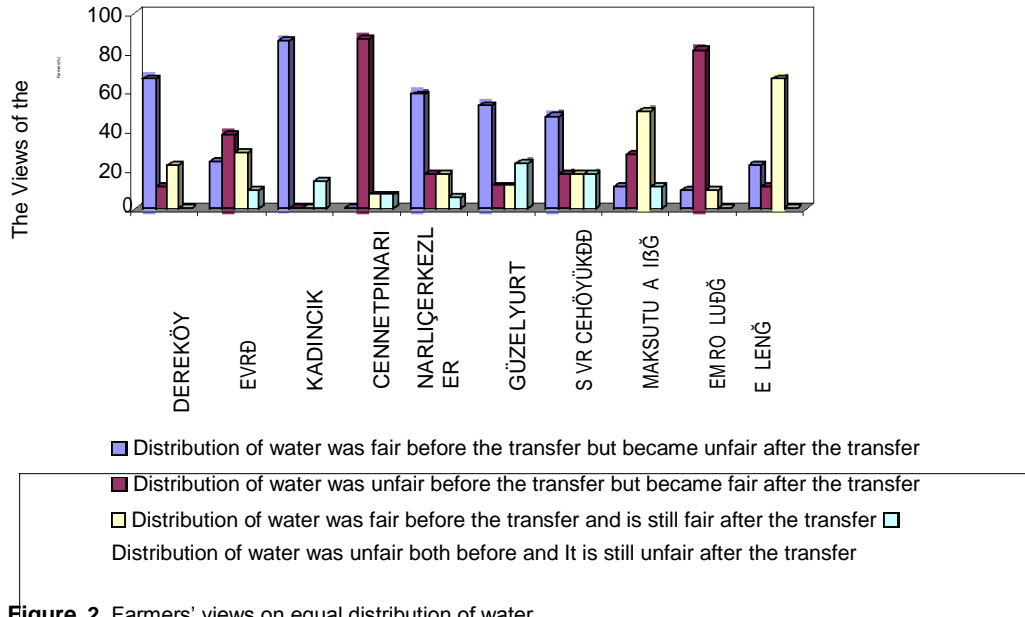


Figure 2. Farmers' views on equal distribution of water.

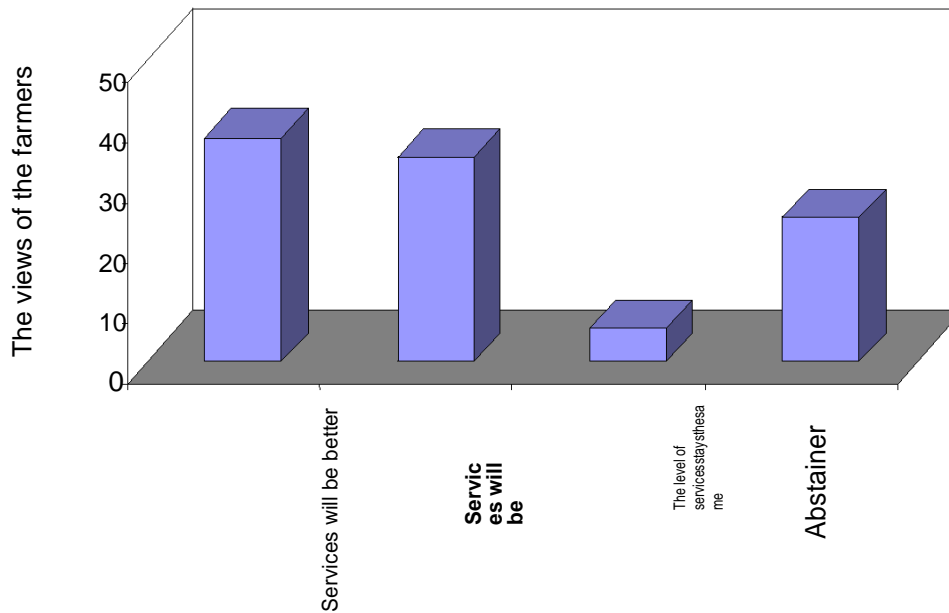


Figure 3. The views about the sustainability of the irrigation association.

while 9.3% reported that water distribution was unfair both before and after the transfer.

Trust farmers who were using the irrigation scheme were questioned on their trust in the management of the irrigation association. This was based on their views of whether the operation–maintenance-management (OMM) services of the irrigation association will be better implemented in subsequent years. As indicated in Figure 3, 33.8% of the farmers expected that the OMM services of the irrigation association would be worse in subsequent

years and thus stated their mistrust of the irrigation association. A total of 37.1% of the farmers thought that OMM services would be better and thus indicated their trust towards irrigation association of the farmers, 5.3% reported that the effectiveness of the program on OMM would remain unchanged, and while 23.8% abstained in this issue.

Based on the trust towards irrigation associations, farmers were asked whether they were aware that the irrigation fees collected were used for OMM

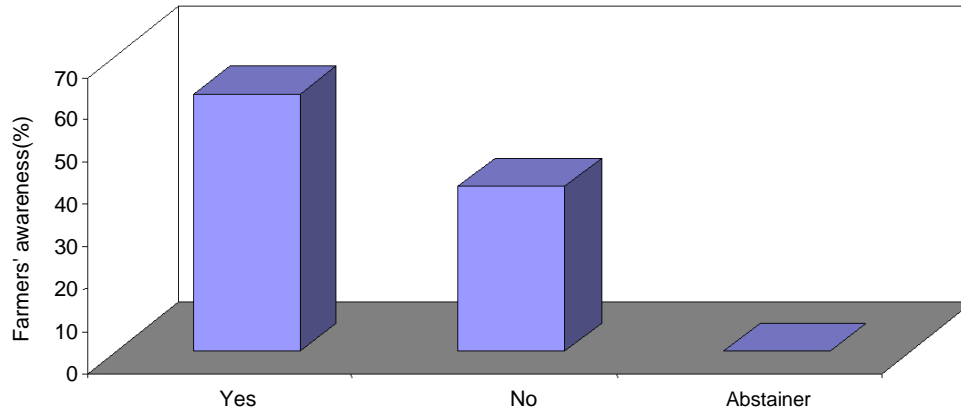


Figure 4. Farmers' awareness of funding OMM services through water fees.

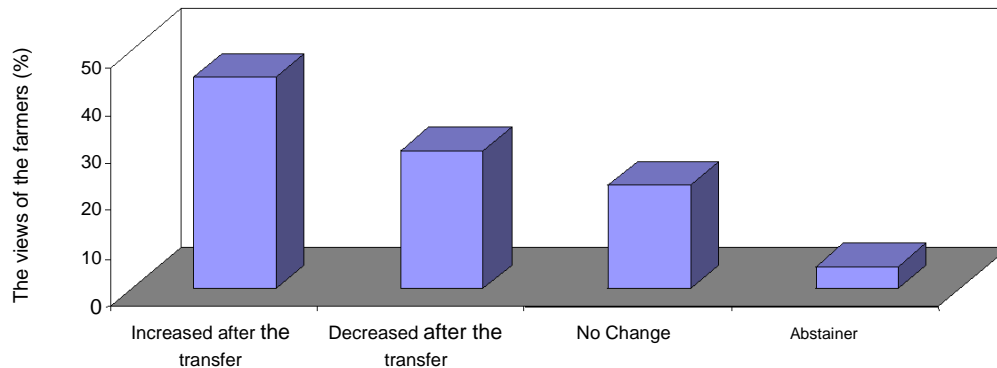


Figure 5. Management interest in farmers' wishes and suggestions.

expenditures. According to Figure 4, 60.9% of the farmers reported that they were aware of this arrangement, while 39.1% were unaware of this situation.

In determining the level of trust in the irrigation program, farmers were asked whether the project managers considered their wishes, suggestions, warnings and interest in the irrigation program. Figure 5 shows the views of farmers on this issue. According to the Figure, 44.4% of the farmers reported that the management was more interested in farmers' views after the transfer; 29.1% reported that the interests of irrigation management decreased after the transfer and 21.9% reported that there was no change in the interest shown by the management. 4.6% of the farmers abstained.

Irrigation timing

It is important for the farmers to receive irrigation water at times when the plants need water. In other words, the timing of irrigation is important. Figure 6 shows the views of the farmers about irrigation timing. A total of 51.7% of the farmers reported that they received irrigation water on time, both before and after the transfer; 8.6% reported

that they could not get water on time before or after the transfer. Of the farmers, 22.5% reported that they were able to get water on time before the transfer, but were unable to get water on time after the transfer. On the other hand, 17.2% reported that they were unable to get water on time before the transfer, but were able to get water on time after the transfer.

Maintenance and repair works

The results of the interviews with the farmers were used to determine the effect of the transfer of management on maintenance and repair works. Farmers' views on the maintenance and repair of irrigation channels are shown in Figure 7.

Figure 7 indicates that 33.1% of the farmers reported that the maintenance and repair works of the irrigation channels was better before the transfer, while 33.1% reported that these maintenance and repair works were better after the transfer. While 26.5% reported that the maintenance and repair of the channels was good both before and after the transfer, 7.3% reported that the maintenance and repair works on the irrigation channels

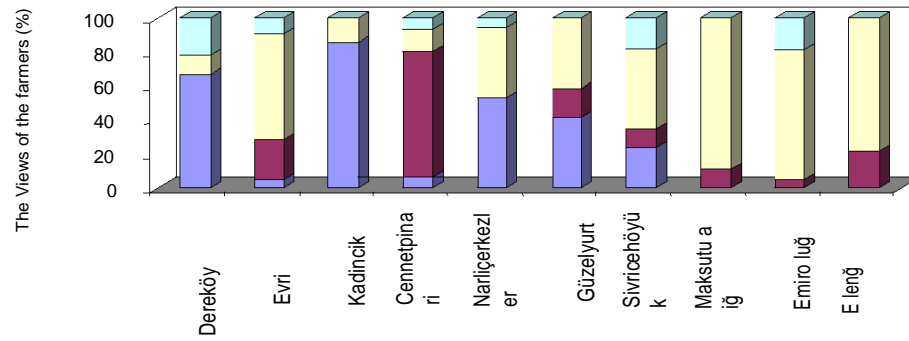


Figure 6. Farmers' views on receiving irrigation water on time.

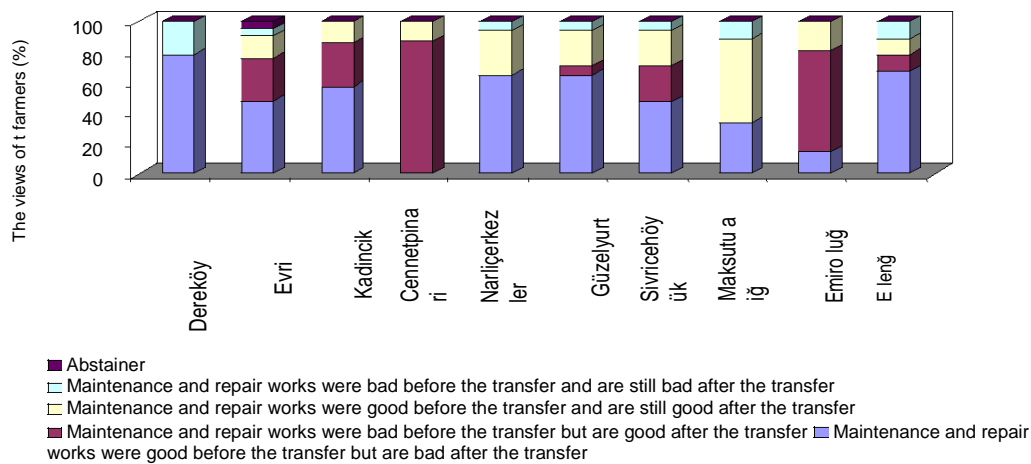


Figure 7. Views on the maintenance and repair of irrigation channels.

Table 1. Changes in irrigation water fees.

Changes in irrigation water fees	%
Water fees increased after the transfer	73.5
Water fees decreased after the transfer	7.9
Water fees did not change	14.6
No Idea	4

were bad both before and after the transfer.

Water fees

Table 1 shows the changes in water fee before and after the transfer of management. Table 2 shows the views of the farmers about the appropriateness of the maturity

data and payment date of water fees. Table 3 shows farmers views on the payment of water fees using an alternative method to cash.

Training for farmers

Table 1 indicates that 73.5% of the farmers reported that irrigation water fees increased after the transfer while 7.9% reported that fees decreased after the transfer. Of the farmers, 14.6% reported that there was no change in water fees following the transfer. These farmers thought that the change was normal.

In Table 2, half of the farmers reported that maturity and payment dates of water fees were appropriate, both before and after the transfer. Of the farmers, 33.8% reported that maturity and payment dates were

Table 2. Maturity and dates of water fees.

Farmers' views on the maturity and payment dates of water fees	%
Dates were appropriate before the transfer. They are not appropriate after the transfer	33.8
Dates were not appropriate before the transfer. They are appropriate after the transfer	13.9
Dates were appropriate both before and after the transfer.	50
Dates were not appropriate before or after the transfer.	2.3

Table 3. Payment alternatives for water fees.

Wish to pay water fee by an alternative means instead of cash	%
Yes	47.7
No	52.3
Alternative payments wishes	
In return for crops	66.7
By working in the enterprise	33.3

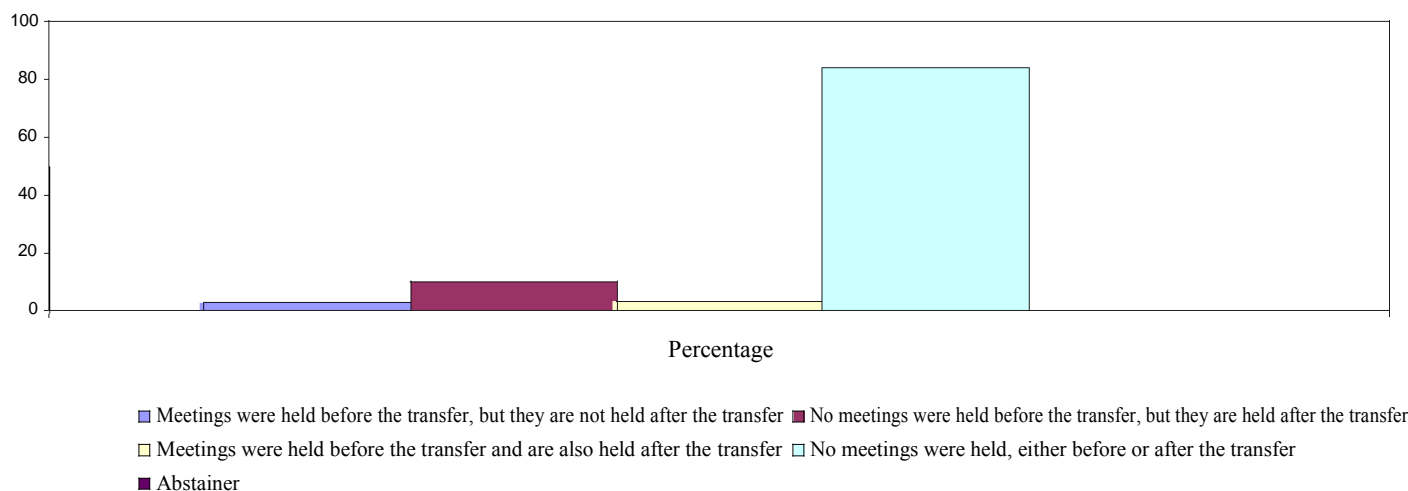


Figure 8. Farmers' views on training seminars and meetings.

appropriate before the transfer but were not appropriate after the transfer. According to Table 3, 47.7% of the farmers wish to pay water fees through an alternative means instead of cash. Among these 66.7% wish to pay the fees by giving crops, while 33.3% wish to work in the enterprise in return for the water fee.

CONCLUSION AND SUGGESTIONS

This study attempted to evaluate the performance of the Kahramanmara Irrigation Scheme, whose management was transferred to the Kartalkaya Right and Left Irrigation Association, by comparing the status of a range of criteria before and after the transfer. The management transfer program was evaluated through interviews with farmers,

village heads, association personnel and managers.

In interviews with farmers, it was observed that they were unable to fully understand the transfer of the irrigation scheme and that they perceived irrigation association as a public organization; in fact, only the personnel of the association are employed in irrigation association. The results indicated that the participation of the farmers, which was one of the primary objectives of the association, could not be achieved. Therefore, the irrigation association should organize activities such as seminars and meetings for the beneficiaries of the system. The scope of these activities should be expanded and importance should be given to agricultural publication services. By training the farmers about modern pressure irrigation methods, the effectiveness of water channels can be improved (Figure 8).

Farmers' views on distribution indicators such as the sufficiency, equality, level of trust and timing of irrigation indicated that the transfer did not have a significant impact on the general of the project. However, as one moved from the water diversion point to the most distant points on the network where the service is provided, the farmers reported negative views about the performance of water distribution after the transfer. This situation indicates that water is not distributed effectively or equitable throughout the irrigation network. In addition, it was found that the farmers did not trust the irrigation association.

Farmers' responses suggest that the transfer had a negative impact on the maintenance and repair of irrigation and drainage channels. The irrigation association should establish a marketing department and should carry out activities to meet farmers' rights, particularly in terms of meeting their obligations to adequately maintain the network. In addition to water management, the irrigation association has an organizational character. It can help the farmers by supplying cheaper and higher-quality agricultural inputs such as fertilizers, pesticides etc. By encouraging the farmers to use modern irrigation systems such as drip irrigation and sprinkler irrigation, more effective water use and higher agricultural yields can be achieved.

REFERENCES

- Anonymous (2004). Evaluation Report of Irrigation Systems Running or Sold by General Directorate of State Hydraulic Works. Publication of Department of Operation and Maintenance. Ankara, Turkey.
- Anonymous (2008). Soil and Irrigation Resources. <http://www.dsi.gov.tr/topraksu.htm>
- De Lange WJ, Wise RM, Forsyth GG, Nahman A (2010). Integrating socio-economic and Biophysical Data to Support Water Allocations Within River Basins: An Example from the Inkomati Water Management Area in South Africa. *Environ. Modelling Software.*, 25(1): 43-50.
- Degirmenci H (1997). A Research on the Effectiveness of Monitoring and Evaluation in Irrigation Management. University of Uludag Institute of Natural and Applied Science, Department of Agriculture Structure and Irrigation, Phd Thesis, 127s, Bursa, Turkey.
- Douglas JA (2009). Social, Political, and Institutional Setting: Water
- Hughes DA, Mallory SJL (2009). The Importance of Operating Rules and Assessments of Beneficial Use in Water Resource Allocation Policy and Management. *Water Policy.*, 11(6): 731-741.
- Juizo D, Hjorth P (2009). Application of a District Management Approach to Southern African River Basin Systems: The Case of the Umbeluzi, Incomati and Maputo River Basins. *Water Policy.*, 11(6): 719-730.
- Khairy WM, Abdel-Dayem MS, Coleman TL (2001). Determining A Better Water Management Using a Geographical technique – A Case Management Problems of the Rio Grande. *J. Water Resour. Plann. Manage.*, 135(6): 493-501.
- Molden DJ, Sakthivadivel R, Perry CJ, Fraiture C (1998). Indicators for Comparing Performance Irrigation Agricultural System. Research Report 20. Colombo, Sri Lanka: IWMI.
- Rey JRD, Franco G, Berrelleza R, Gutierrez J, Gonzalez J and Gonzalez L (2007). EchoTech: A Water Management System. Electronics, 17th International Conference, Communications and Computers. CONIELECOMP.
- Rieser A, Loof R, Gideon O (1994). System Analysis For Irrigation Performance Assessment. German-Israel Agricultural Research Agreement, Research Programme For The Benefit Of DC, No.D-204, March, 28s Study in Egypt. *Geosci. Remote Sensing Symposium, Australia, 09-13/07/2001.*, 1: 453-455.
- Vermillion DL, Samad M, Pusposutardjo S, Arif SS, Rochdyanto S (1999). An Assessment of the Small-Scale Irrigation Management Turnover Program in Indonesia. International Water Management Institute, Research Report: 38, Colombo, Sri Lanka, 32s.
- Visitacion BJ, Booth BD, Steinemann CA (2009). Costs and Benefits of Storm-Water Management: Case Study of Puget Sound Region. *J. Urban Plan. Dev.*, 135(4): 150-158.
- Whittington D, Davis J, Prokopy L, Komives K, Thorsten R, Lukacs H, Bakalian A, Wakeman W (2009). How well is the Demand-Driven, Community Management Model for Rural Water Supply Systems Doing? *Water Policy.*, 11(6): 696-718.