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ABSTRACTS
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FIELD TRIP GUIDE-BOOK

INFILTRATION ASSESSMENT OF TRANSFERRED WATER IN THE MANAGEMENT OF A MEDITERRANEAN MAN-MAINTAINED WETLAND: LAS TABLAS DE DAIMIEL NATIONAL PARK (SPAIN)

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Issue 2. Use, protection and management of groundwater resources

The Tablas de Daimiel National Park wetlands (Central Spain, Fig. 1) had their main origin in the West La Mancha aquifer discharges. Inflows into these wetlands ceased due to aquifer over-exploitation.

The progressive deterioration of the wetland brought about several attempts of remedial actions by means of building some little dams and pumping groundwater to Las Tablas basin. The main attempt to preserve these wetlands has been made by means of transbasin transfers (Fig. 1). However, a part of these water transfers is lost within the wetland basin due to infiltration towards the underlying aquifer.

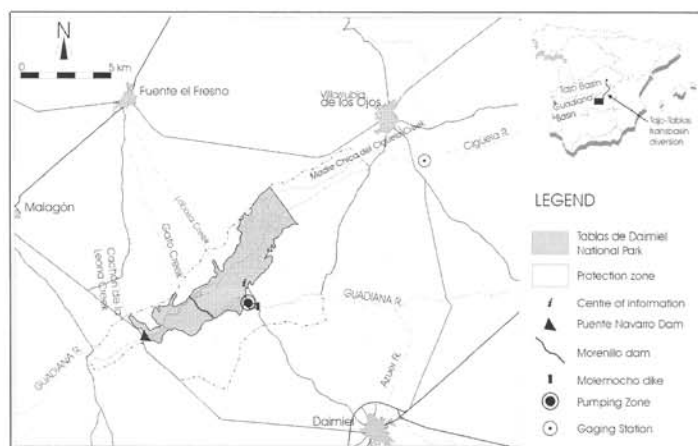


Fig. 1. Location of Tablas de Daimiel National Park and some of the elements influencing its water balance (modified from Martínez-Alfaro and Castaño, 2001)

Infiltration becomes an essential parameter in any study related to the attempts at keeping some water in the basin and, therefore, in the integral management of the systems water resources related with the wetland. The actual extent of these losses is unfortunately difficult to quantify due to the poor quality of existing data as well as to the impossibility of determination of various important parameters.

Martínez-Alfaro and Castaño (2001) developed a methodology to assess a preliminary infiltration coefficient. It applies daily water bal-

ances considering the geometry of the basin and the flooded area. The methodology was applied for 1996 (water from Tajo basin is transferred to Las Tablas) and 1997 (extraordinary surface runoff occurs), when the water regime was already influenced by abstractions carried out in the aquifer. The calculated infiltration coefficient was 10 mm/d.

Complementarily, a specialised software for parameter estimation (Watermark..., 1998) has been applied to an specific program designed to calculate the water balance in Las Tablas. The estimated parameters were the infiltration coefficient and some geometrical values. The results obtained were similar to that used in the preliminary balance.

As the balance was calculated using the flooded area, the program can be utilised for the integrated management of water in the National Park, in the aquifer where part of the infiltrated water recharges and in the Tajo Basin, where the transferred water comes from.

Table 1 compares measured data of flooded area and those obtained by means of preliminary balance and PEST program from January to September 1996, when the whole surface input came from Tajo basin.

Table 1

Comparison between calculated (preliminary and four automatic estimations) and observed maximum flood area, and percentage of days with ponded surface areas surpassing two critical values

Estimation	Maximum flooded area (m ² ×10 ⁴)	Maximum flood Date	Difference with measured (%)	Days flooded area >600 m ² ×10 ⁴ (%)	Days flooded area >850 m ² ×10 ⁴ (%)
Preliminary	1412	05/25/1996	1.40	52.19	41.24
PEST 01	1425	05/25/1996	0.49	53.28	41.97
PEST 02	1425	05/25/1996	0.49	52.90	41.67
PEST 03	1412	05/25/1996	1.40	52.19	41.24
PEST 04	1356	05/26/1996	5.31	52.92	41.24
Measured	1432	05/29/1996		62.96	48.15

Note: Only 27 flooded area measures in 274 days from 1st January to 30th September 1996

If the rate and temporal distribution of the transferred discharges, and some meteorological variables are assessed, it will be possible to predict the near-real flooded surface and apply other additional remedial actions if necessary to improve conditions for both flora and fauna of the National Park.

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