

**Acequias and the Future of  
Resilience in Global Perspective**

Symposium & Workshop

March 2 - 3, 2013

Las Cruces Convention Center  
Las Cruces, NM

***Safeguarding Valencian Acequias:  
History and Values of a Millennial  
Water Sharing Culture***

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**1. THE VALENCIAN ACEQUIA CULTURE:  
BRIEF HISTORICAL BACKGROUND**

**2. PRINCIPLES AND VALUES IN THE  
DESIGN OF THE VALENCIAN  
ACEQUIA SYSTEMS**

**3. RESISTENCE AND RESILIENCE:  
PROSPECTS FOR THE VALENCIAN  
ACEQUIAS**

**.1.**

**THE VALENCIAN ACEQUIA CULTURE:  
BRIEF HISTORICAL BACKGROUND**

Irrigation in Valencia before the  
Romans is a matter of pure speculation.

Roman hydraulics left unquestionable testimonies in Valencia, but the question of the relationship of the urban-oriented Roman aqueducts with irrigation and agriculture remains open to discussion.

# Peña Cortada Roman aqueduct (Chelva, Valencia province).



Photo: Petercero

Available at: <http://www.arteyfotografia.com.ar/2565/fotos/24927/>

Most of the Roman hydraulics collapsed during the long lasting crisis of the Late Roman Empire and the Dark Ages, which had in the ruin of urban life a clear exponent.

Photo: Luis Pablo Martínez



**Peña Cortada Roman aqueduct (Chelva, Valencia province).**



The Valencian acequia culture was a product of the settlement policies promoted by the Muslim conquerors of the Iberian peninsula, from the year 711 A.C. on.

Al-Andalus, Muslim Spain, experienced a general economic, social and cultural renaissance from the X century on, thanks to the construction and development of acequia systems.

Old cities like Valencia or Orihuela where revitalized by the improvement of their surrounding agrarian landscape, and many other new medinas (like Murcia, Elche or Granada) where built in parallel to the construction of new acequia systems.

Far from destroying the Andalusian acequia culture, the Christian conquerors assumed and promoted it. In Valencia, acequia irrigation kept on growing until the XX century.

**The only written document preserved from the Muslim kingdom of Valencia is an acequia document (sentence of the qadi of Morvedre in a case opposing upstream and downstream irrigators of the river Palancia, 1223 A.C.).**

Source: Vicente Giner Boira, *El Tribunal de las Aguas de Valencia*, Valencia, Javier Boronat editor, 1995; available at: [http://hispagua.cedex.es/sites/default/files/cultura\\_del\\_agua/Tribunal\\_Aguas\\_Valencia/Pleito.htm](http://hispagua.cedex.es/sites/default/files/cultura_del_agua/Tribunal_Aguas_Valencia/Pleito.htm)



Pergamino árabe de 1223.  
Documento el más antiguo en el archivo del Reino de Valencia.

**.2.**

**PRINCIPLES AND VALUES IN  
THE DESIGN OF THE VALENCIAN  
ACEQUIA SYSTEMS**

Complexity and environmental adaptation are two defining features of the Andalusian acequia systems.

Acequia systems were complex because, in spite of their size, they all were able to integrate fairly different and *a priori* contradictory uses.



The waters of any given acequia system were able to meet agricultural uses (irrigation), artisanal uses (crafts processing of raw materials), industrial uses (watermills) and village uses (washing places, public baths, sanitation infrastructures), as well as to quench the thirst of men and animals.

How was it possible?

By means of an adequate design,  
reflected both in the tangible (physical)  
and intangible (norms and institutions)  
dimensions of the system.

Through a mindful territorial pattern of use setting, the physical design tried to reconcile the equitable and sustainable access to water of all users with less room for the emergence of technical and environmental conflict.

It was achieved by means of:

(a) The adequate design of the canal network (water intake, mother ditch, main branches, drainage ditches), with regard to the characteristics of the water available, the terrain gradient, the location of the lands to be irrigated and that of the main population settlements, existent or planned.

(b) The insertion of measurable spillways, water dividers and (if necessary) water tanks at critical points of the ditch network.

**Dam of the Acequia de Tormos (Valencia). All the dams feeding the main canals of the Huerta de Valencia had a sluice gate to return to the river all the water retained in case of severe drought, when a strict turn of access between the acequias was customarily enforced.**



Photo : Luis Pablo Martínez



**Water divider of the Acequia de Tormos (*partidor del Raig*). This carefully leveled structure, that divided in two equal parts the waters of the Benicalap branch of the Acequia de Tormos, used as metrological pattern the Egyptian cubit. It's a *llengua* (tongue) type water divider, typical of the Huerta of Valencia**



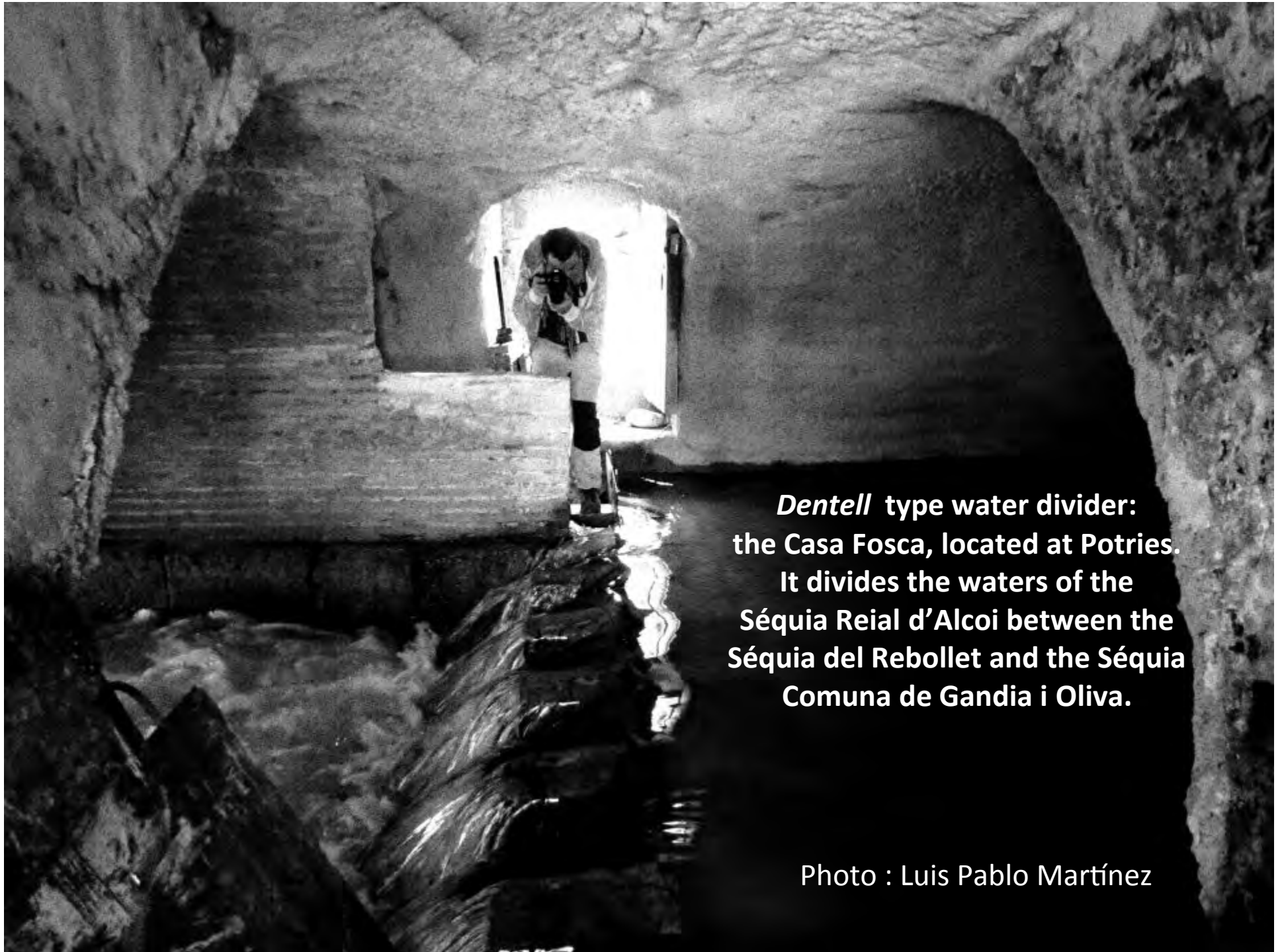
Source: <http://llenguesdelraig.blogspot.com.es/>

**Water divider of the Séquia del Terç de Castelló, a branch of the Séquia Comuna de l'Enova.**



Photo : Luis Pablo Martínez

**It's a *dentell* (small tooth) type water divider typical of the huertas between Xàtiva and Gandia.**

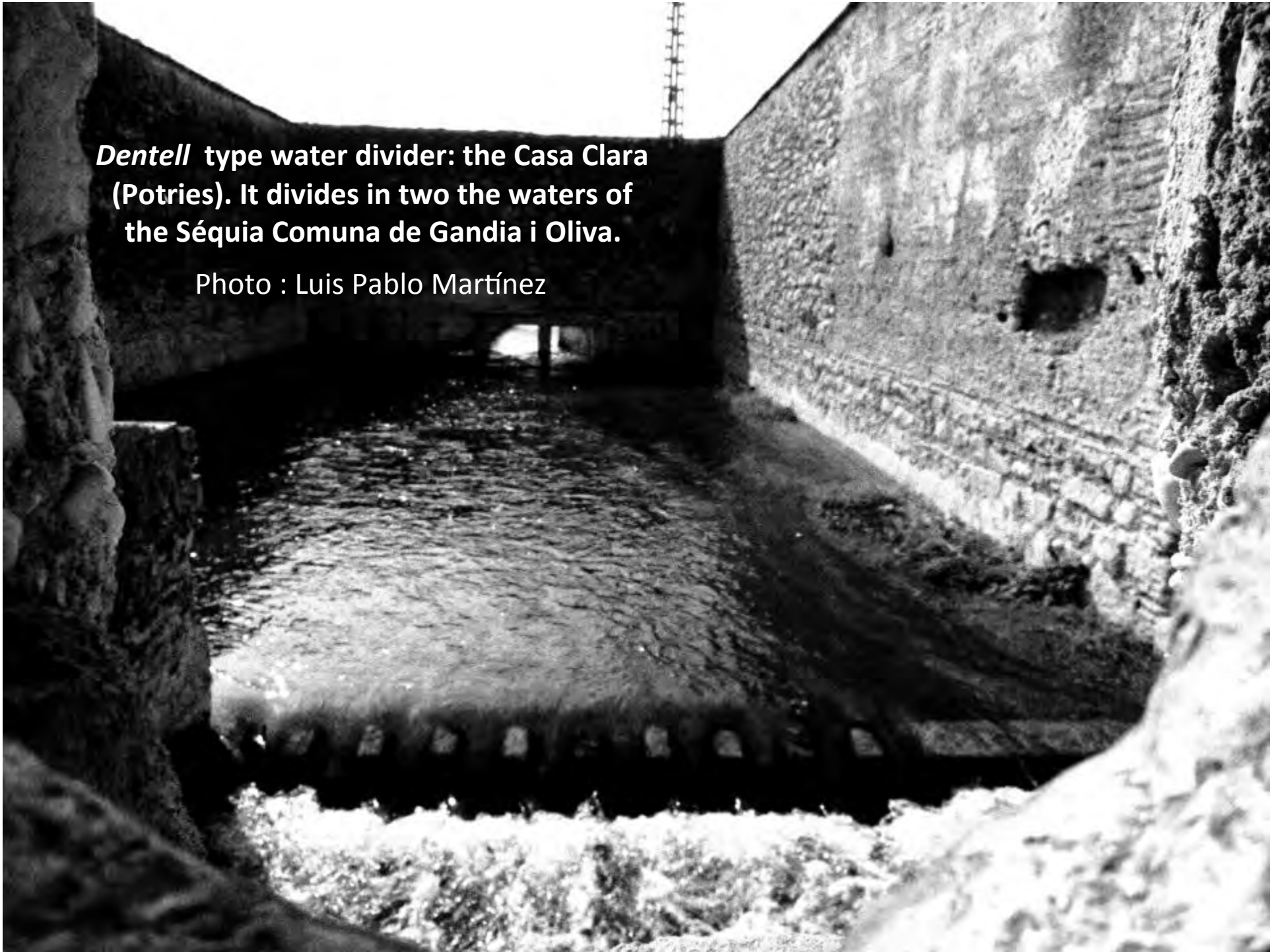


***Dentell* type water divider:  
the Casa Fosca, located at Potries.  
It divides the waters of the  
Séquia Reial d'Alcoi between the  
Séquia del Rebollet and the Séquia  
Comuna de Gandia i Oliva.**

Photo : Luis Pablo Martínez

***Dentell* type water divider: the Casa Clara (Potries). It divides in two the waters of the Séquia Comuna de Gandia i Oliva.**

Photo : Luis Pablo Martínez



(c) The spatial arrangement of the different water uses (a function of the cultural hierarchy of uses combined with the water reuse capacity of each particular use).

[First, fountains and watering places for human and animal consumption; second, watermills, that don't consume water; third, village uses that reuse, consume and/or pollute waters; fourth, irrigation, that bleeds the acequias.]

**Font de la Mata (Benirrama, Vall de Gallinera).  
Human and animal consumption at the starting point of an acequia system.**



Photo: José Cambrils Sendra

# Irrigation system of the Barranc dels Molins (Ibi). Cluster of different water uses arranged in sequence before irrigation.

(3). Paper watermill

Upstream, non visible:  
(1) fountain & (2) battery  
of flour watermills

(4). Communal washing place (ordinary)

(5). Communal water tank (for irrigation)

(4). Communal washing place (for the sick people)



**Orihuela, 19th c.: watermills as the first users in an acequia system. The mills, built in the river bed, took advantage of the dam's overflow waters.**

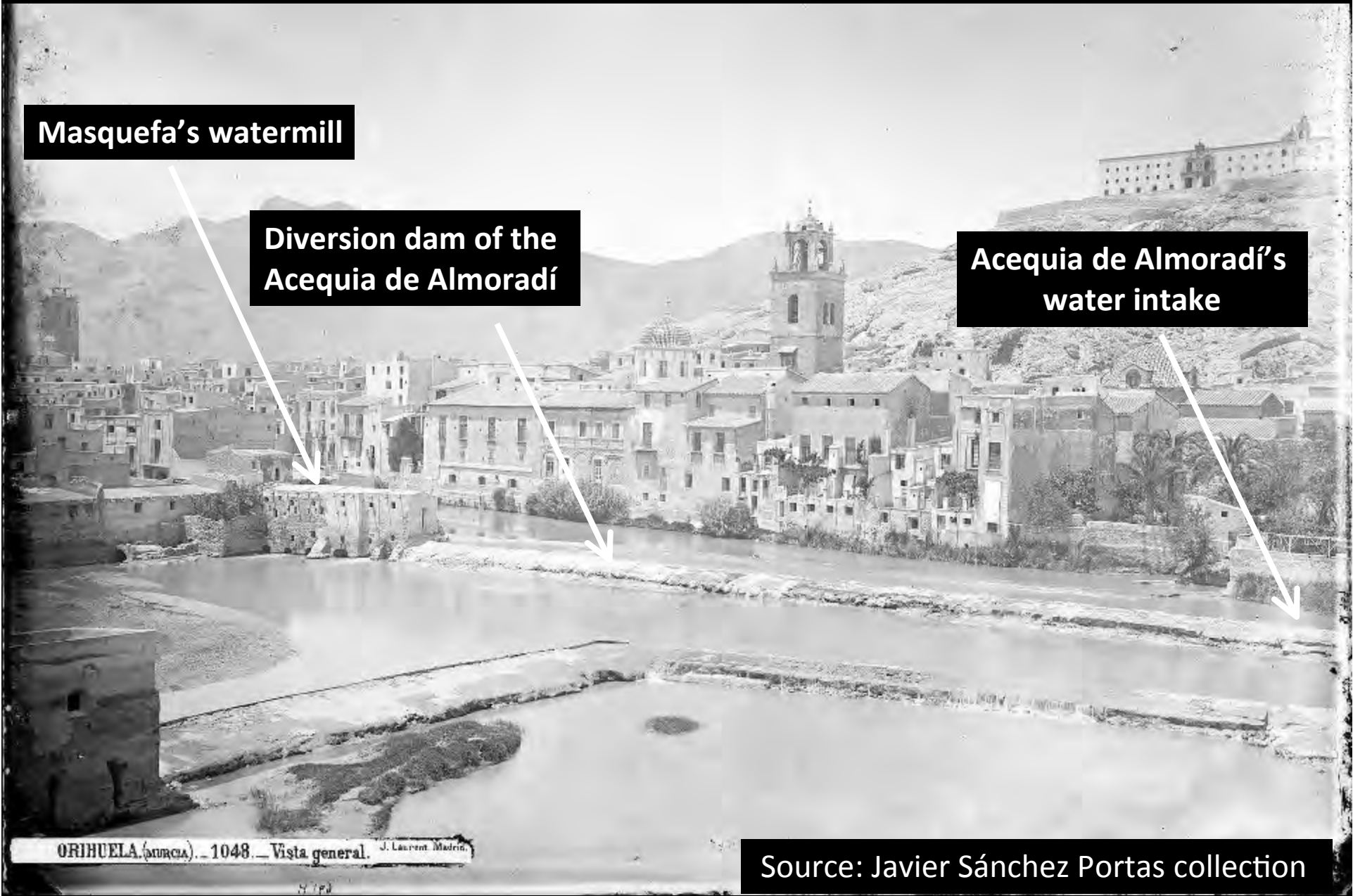
**Masquefa's watermill**

**Diversion dam of the  
Acequia de Almoradí**

**Acequia de Almoradí's  
water intake**

ORIHUELA (MURCIA). - 1048. - Vista general. J. Laurent Madrid.

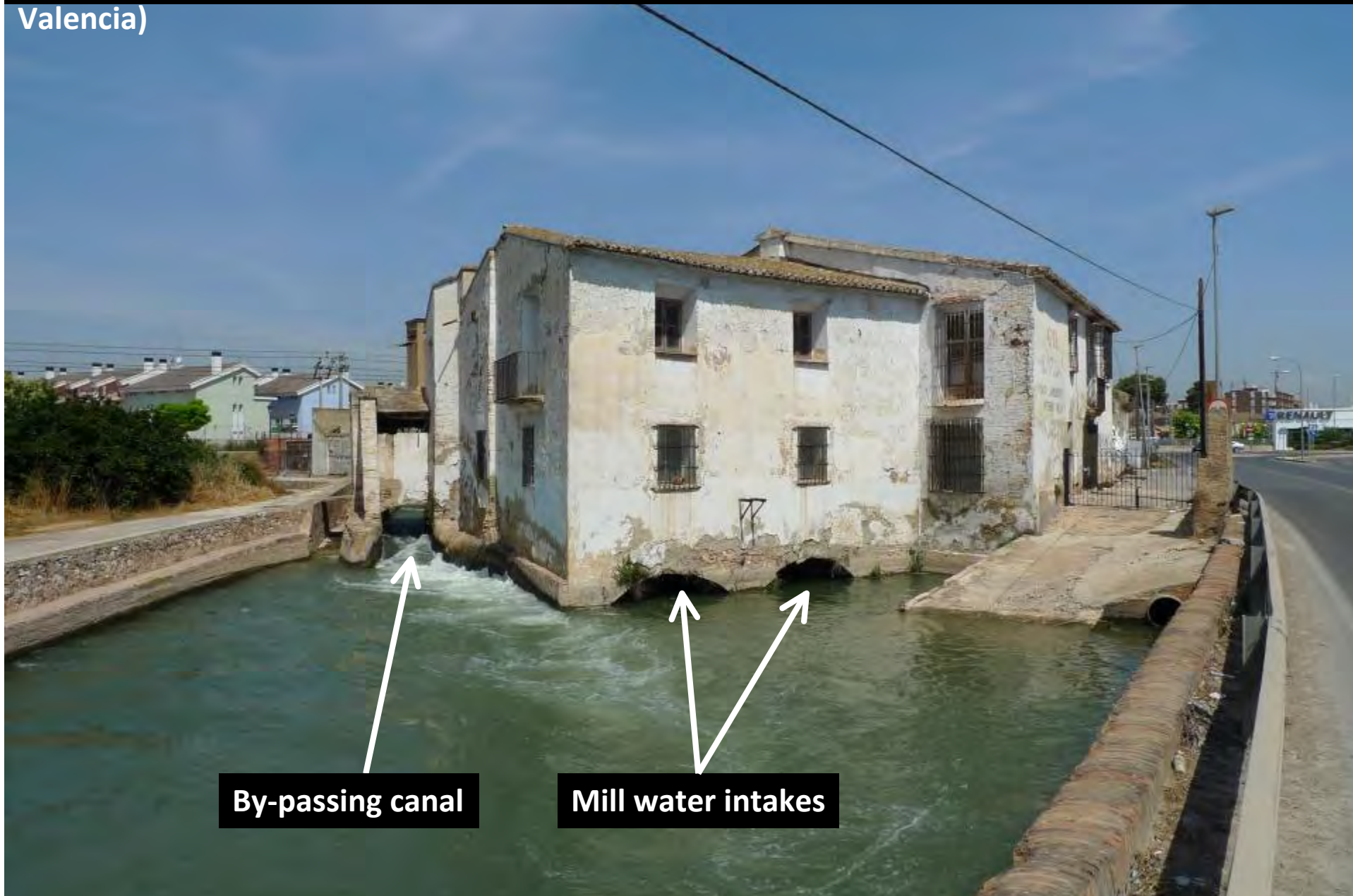
Source: Javier Sánchez Portas collection



[Being the last in receiving water didn't mean that the irrigators were subdued by the other water users. On the contrary, each acequia system incorporated physical devices whose function, in correspondence with the system norms, was to guarantee the irrigator's priority in the case of water scarcity]:

(d) The construction of canals  
bypassing the watermills.

**Watermill of Moncada, on the main canal of the Reial Séquia de Moncada (Huerta de Valencia)**



**By-passing canal**

**Mill water intakes**

Photo: Miguel del Rey

The design of the intangible side of the system provided additional mechanisms to guarantee its sustainability, like:

The formulation of norms of use  
(oral and written) known to all users.

The proclamation of the right of all users to an equitable access to water.

The use of a known,  
fixed metrical pattern.



The proclamation of the water shares corresponding to different communities and/or groups of users served by the system.

The establishment of turns  
between the different groups of users.

The prohibition of certain uses  
in certain sections of the system.

The prohibition or restriction  
of certain uses in times of drought.

The promotion of certain crops  
(and eventually the prohibition  
of some others).

Photo : Jaime Brotons



The medina of Elche and its Acequia Mayor were built to the end of the X century a.C. The irrigation system carried the salty waters of the Vinalopo river. It performed well thanks to the associated cultivation of salt-tolerant species like date palms, pomegranate trees and alfalfa.

The prohibition of certain forms of irrigation and water management.

“De cavallonar” (**on furrowing**), chapter 52 of the Ordinances of the Séquia de Favara (1446). Irrigation without previous furrowing of the field was prohibited.

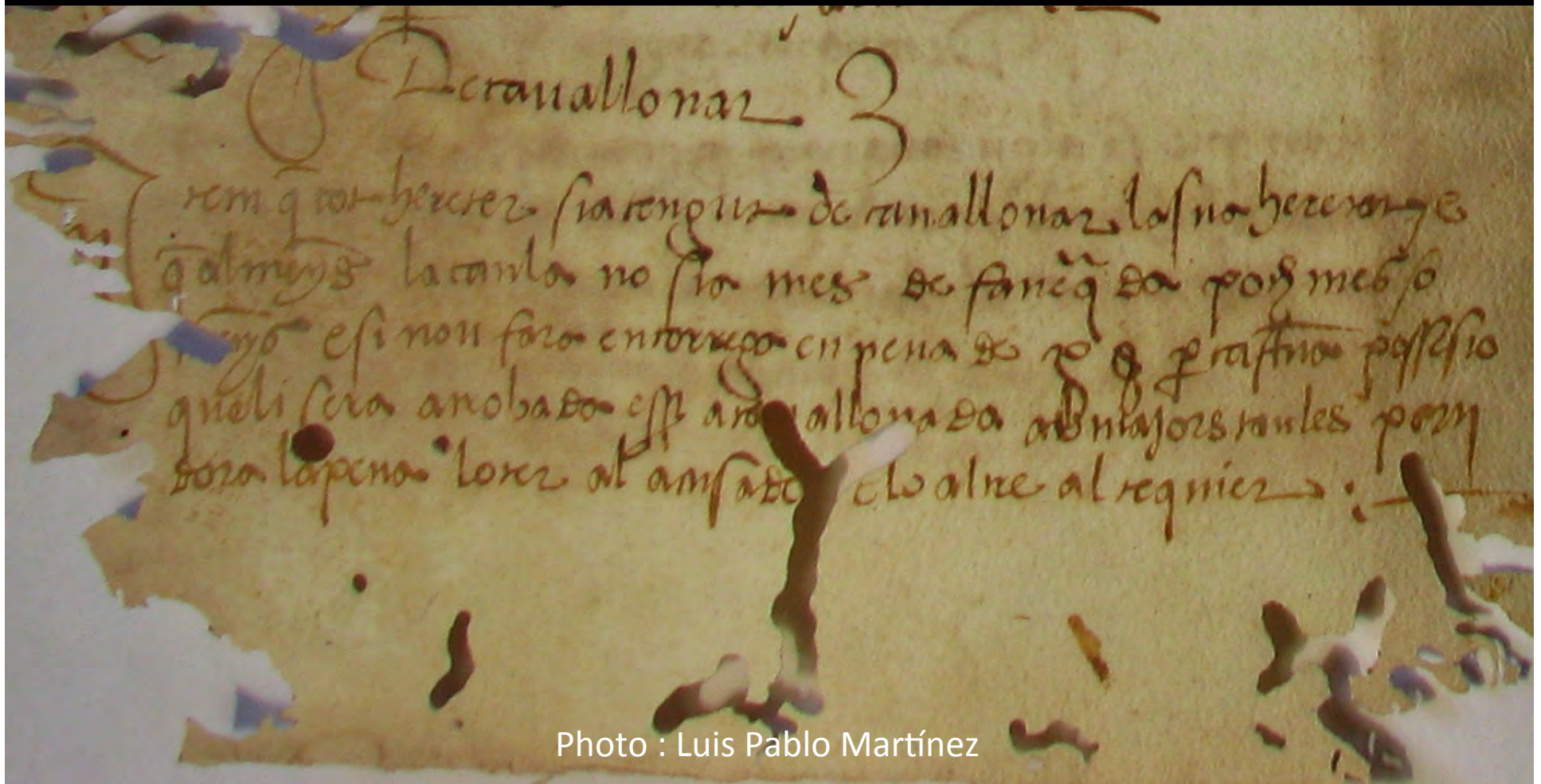


Photo : Luis Pablo Martínez



## A furrow-irrigated field in the Huerta of Valencia.



Photo: Luis Pablo Martínez

The regulation of the obligations  
of all users regarding the maintenance  
of the system.

The establishment of institutional mechanisms of control and fraud deterrence (supervisors, legal bodies, coercive sanctions).



45 - VALENCIA. El Típico Tribunal de las Aguas a la puerta de la Catedral

The imprint of the intangible is clearly visible in the tangible side of the system, and vice versa.

**“The Book of  
Agreements,  
Regulations  
and other Acts  
of the Acequia  
de Favara”**

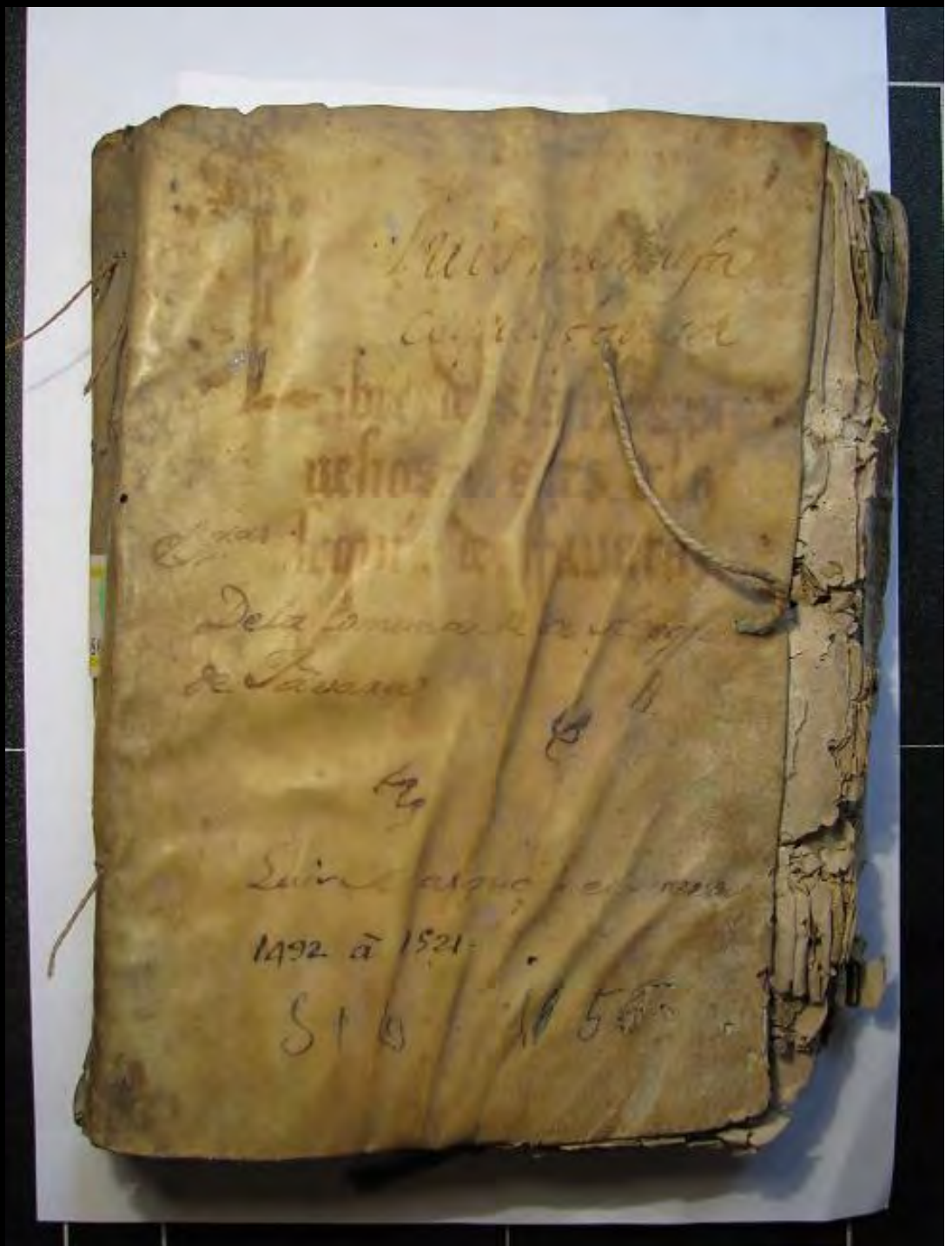


Photo : Luis Pablo Martínez

The book, which includes the ordinances approved by the community of irrigators from 1446 on...

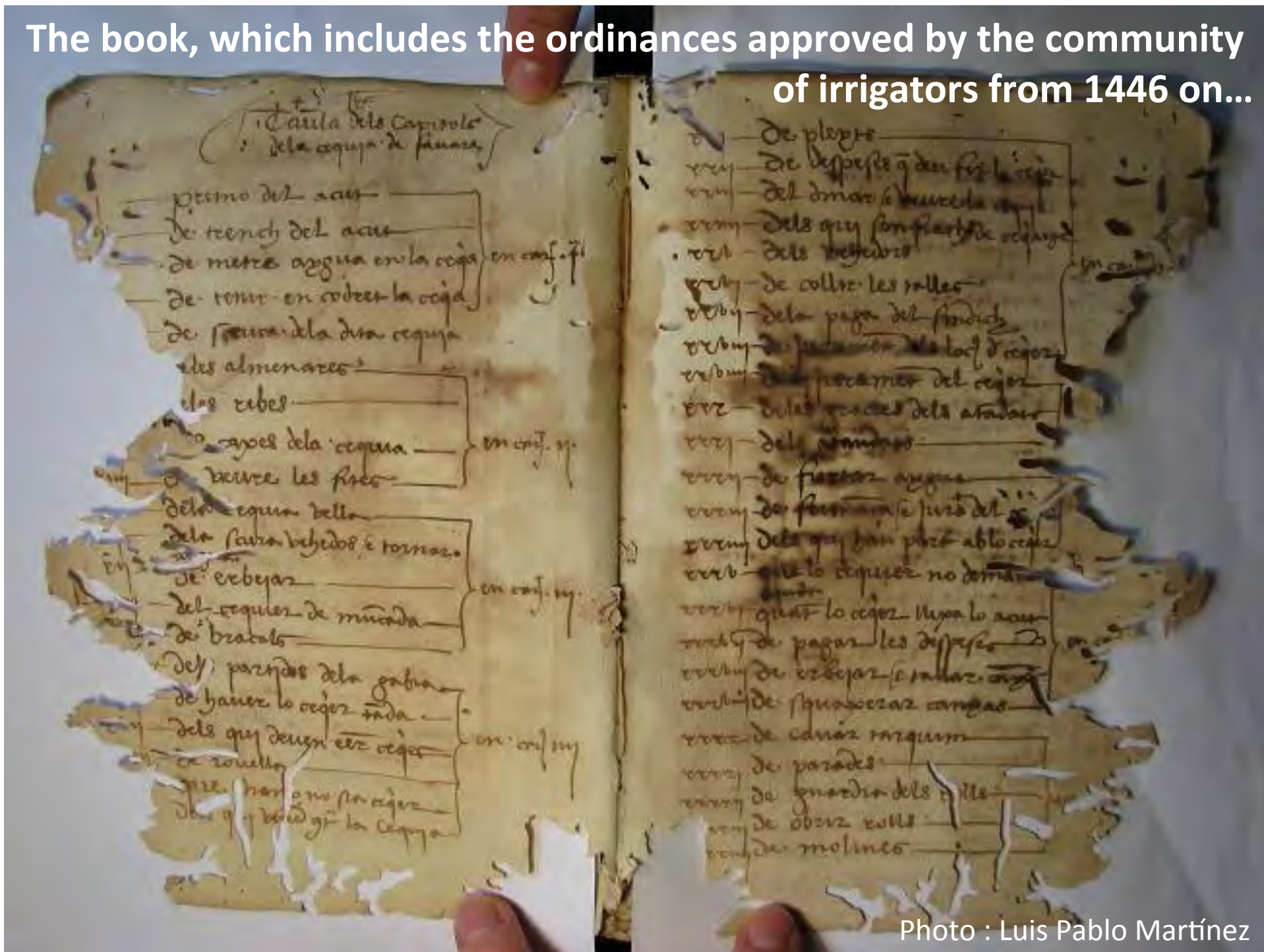


Photo : Luis Pablo Martínez

...begins with a copy of a detailed description of the many water dividers of the system written in 1363, on the eve of a Castilian attack to Valencia, whose impact on the system's checkpoints the irrigators feared the most.

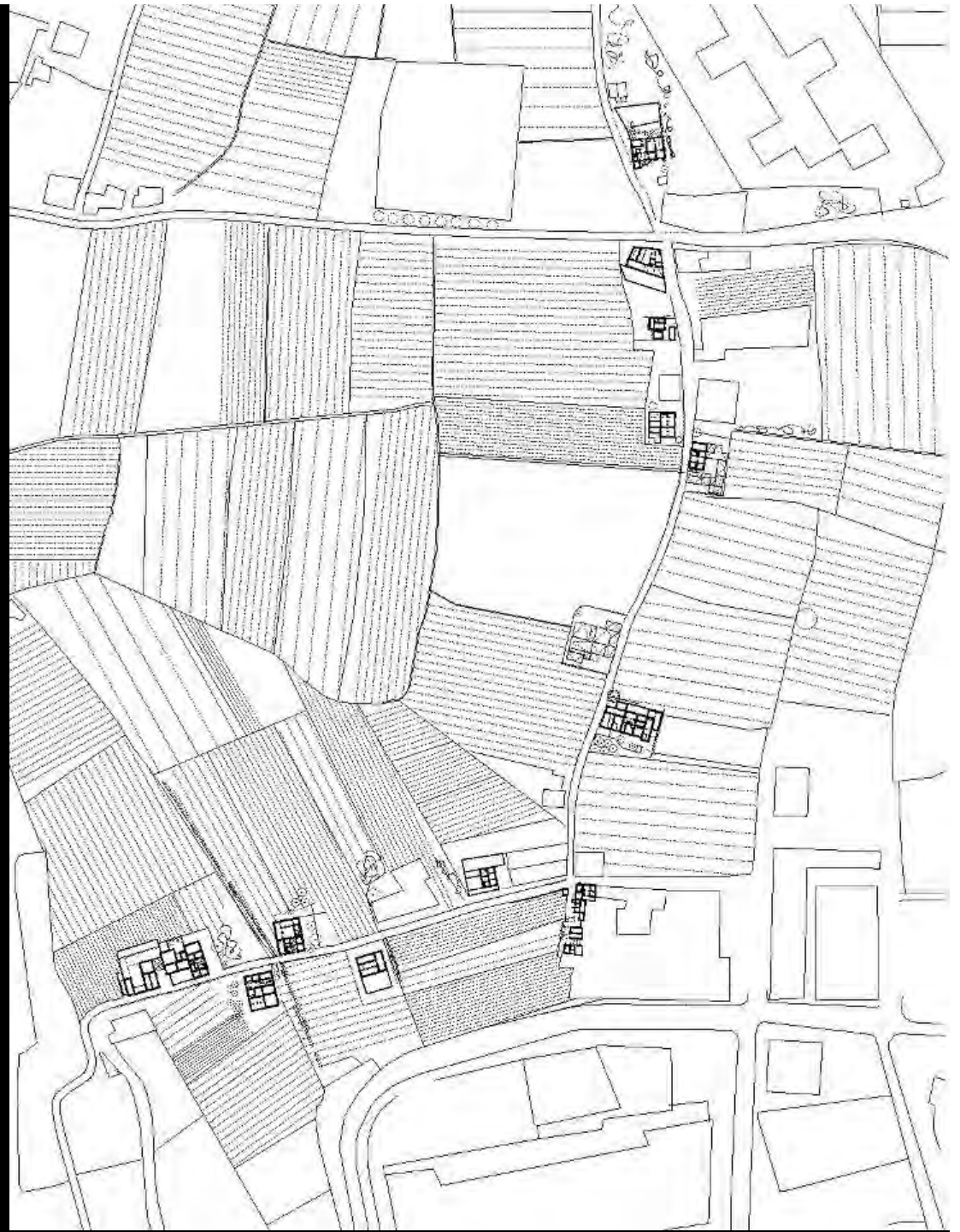
*[Handwritten text in a historical script, likely Spanish or Catalan, describing the Valencia water system. The text is written in dark ink on aged, yellowed paper. It begins with a large initial letter 'H' and contains several lines of dense cursive script. There are some red markings and a large bracket-like symbol at the top right of the page. The text appears to be a legal or official document, possibly a charter or a set of regulations related to the water system mentioned in the text on the left.]*

Photo : Luis Pablo Martínez



**In the Pouet district of Campanar, huerta of Valencia, the irrigation ditches were named after the days of the week, reflecting the customary calendar of water distribution in the fila de Campanar, one branch of the Séquia de Tormos.**

Source: Miguel del Rey, *Arquitectura Rural Valenciana*, Cabrera de Mar, Galerada, 2010.



**.3.**

**RESISTENCE AND RESILIENCE:  
PROSPECTS FOR THE  
VALENCIAN ACEQUIAS**

Nowadays, the Valencian acequia culture faces the risk of extinction, because of the pressure put by the speculators on the huerta irrigated lands and on the water for irrigation, plus the crisis of the agricultural sector.

Nevertheless, there are signs that indicate that there is still a future for the Valencian acequias, such as:

The commitment of the civil society to the safeguarding of the acequia systems and the huerta landscapes, now considered a fundamental constituent of the Valencian cultural heritage and a source of healthy food, biodiversity and quality of life.



**DEIXEM L'HORTA VIVA**  
**L'ASFALT NO ES MENJA**

PER L'HORTA  
www.perlhorta.es

Universitat d'estiu de l'Horta

Agrupament de Godella

**8. UNIVERSITAT D'ESTIU DE L'HORTA**  
del 13 al 17 de juliol 2009  
A l'Escorxador de Godella

“Let’s leave the Horta alive. Asphalt is not edible”. Motto of the 8<sup>th</sup> Summer University organized by the civic platform **Per l’Horta**.

Source: <http://perlhorta.blogspot.com.es>

**Billboard of the activity organized by the Assut Foundation  
(Fundació Assut) on February 16, 2013, celebrating the  
World Wetlands Day.**



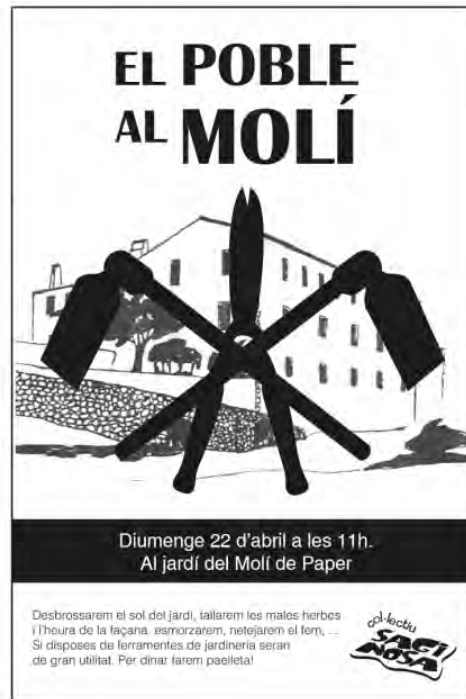
**assut**  
FUNDACIÓ

**Dia dels aiguamolls a l'Estell**

Dissabte, 16 de febrer, a les 10.30 h.

Available at: <http://fundacioassut.org/>

All around the region,  
more and more local  
groups organize in  
defense of the acequia  
heritage and culture.



Ibi

<http://saginosawordpress.com/>

Benimaclet (Valencia)

<http://avvbenimaclet.wordpress.com/proyecto-huertos/>



Banyeres de Mariola

<http://assuts.banyeres.com/>

SALVEM L'HORTA  
DE BENIMACLET

Ajuda'ns a combatre els especuladors  
del BBVA



Divendres 27 a la 13:30 concentració a la seu del BBVA del C/ Poeta Querol

Dissabte 28 a les 10:30 manifestació des de la plaça de Benimaclet



**A similar trend is occurring in other  
acequia regions in Spain**



**HUERMUR**  
Asociación para la  
Conservación de la  
Huerta de Murcia

<http://www.huermur.es/>

# Acequia tourism emerges as a real value for locals and

# HORTA VIVA

[ABOUT US](#)[NEWS](#)[GASTRONOMY](#)[TOURS IN L'HORTA](#)[EDUCATION](#)[LA HUERTA](#)[CONTACT](#)

## HORTA VIVA WE LOVE L'HORTA!



L'Horta de Valencia is 5 minutes from a big city like Valencia, but retaining the charm and culture of a historic rural area. It is one of the six peri-urban "huertas" that remain in Europe, with 3 or more annual crops of tasty vegetables.

For centuries, the mixture of water, land and the wisdom of the farmers have formed a cultural landscape of global relevance, as demonstrated by the recent statement by the Tribunal de las Aguas as intangible heritage of humanity.

From **Horta Viva** we want to show you this place from inside, so we are also farmers, and we want to share with you our passion for *L'Horta* and his beauty that you can find in the next video. Are you coming with us?

### News

#### Rice tour: Sunday 3rd March

29/01/2013



We have a new tour! For Sunday March 3rd at 10:30h, we have programmed the new route "Rice DO in the Albufera" for individuals, that is, for those who can not form a group and come the day they choose. ... [Continue reading](#) →

#### New tour: Rice in l'Albufera of València

08/01/2013



After three years working in the Horta Nord, finally Horta Viva boots River Turia to know an interesting crop, rice with designation of origin Valencia. We present our new "Rice tour", an activity that we have prepared in collaboration with ... [Continue reading](#) →

### Schools Activities

[Click here to see our catalog](#)

<http://www.hortaviva.net/en/>

The commitment of governments to the safeguarding and valorization of acequias (most noteworthy at the municipal level).

Celebration of the  
International Day for  
Monuments and Sites  
2011 dedicated to the  
Cultural Heritage of  
Water organized by the  
city council of Banyeres  
de Mariola

Available at:

[http://www.portademariola.com/  
UserFiles/File/museus/  
cartel%20Banyeres.w.pdf](http://www.portademariola.com/UserFiles/File/museus/cartel%20Banyeres.w.pdf)



Celebración del Día Internacional de  
los Monumentos y los Sitios dedicado al  
**Patrimonio Cultural del Agua**  
Celebració del Dia Internacional dels  
Monuments i els Llocs Històrics dedicat al  
**Patrimoni Cultural de l'Aigua**



MINISTERIO DE CULTURA  
CONSEJO REGULADOR DEL PATRIMONIO CULTURAL  
COMUNIDAD Valenciana



ayuntamiento de  
Banyeres de Mariola

Banyeres de Mariola

18 de abril 2011

18 d'abril 2011

[www.es.comex.org](http://www.es.comex.org)  
[www.portademariola.com](http://www.portademariola.com)  
Banyeres de Mariola

The city council of Potries has established a water route with the acequia culture tangible elements.

## LA RUTA DE L'AIGUA AL SEU PAS PER POTRIES

- 1 Pou
- 2 Llavador públic
- 3 Partidor d'aigües de la Casa Fosca
- 4 Anivellador d'aigües
- 5 Sénia
- 6 Fila de la Catorzena
- 7 Partidor d'aigües de la Casa Clara
- 8 Moli Canyar

- Zona d'esplai
- Vista panoràmica
- Punt d'informació
- Elements arquitectònics d'interés

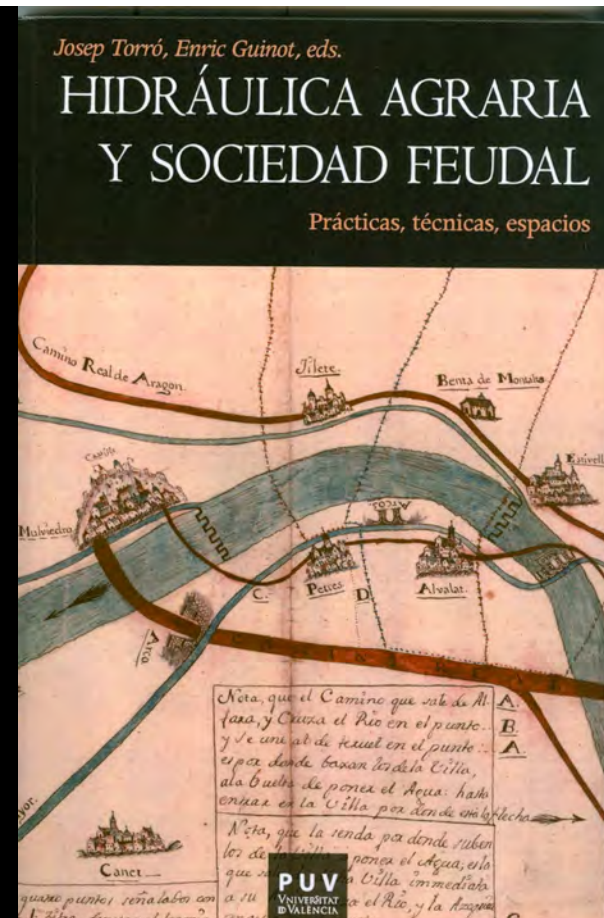
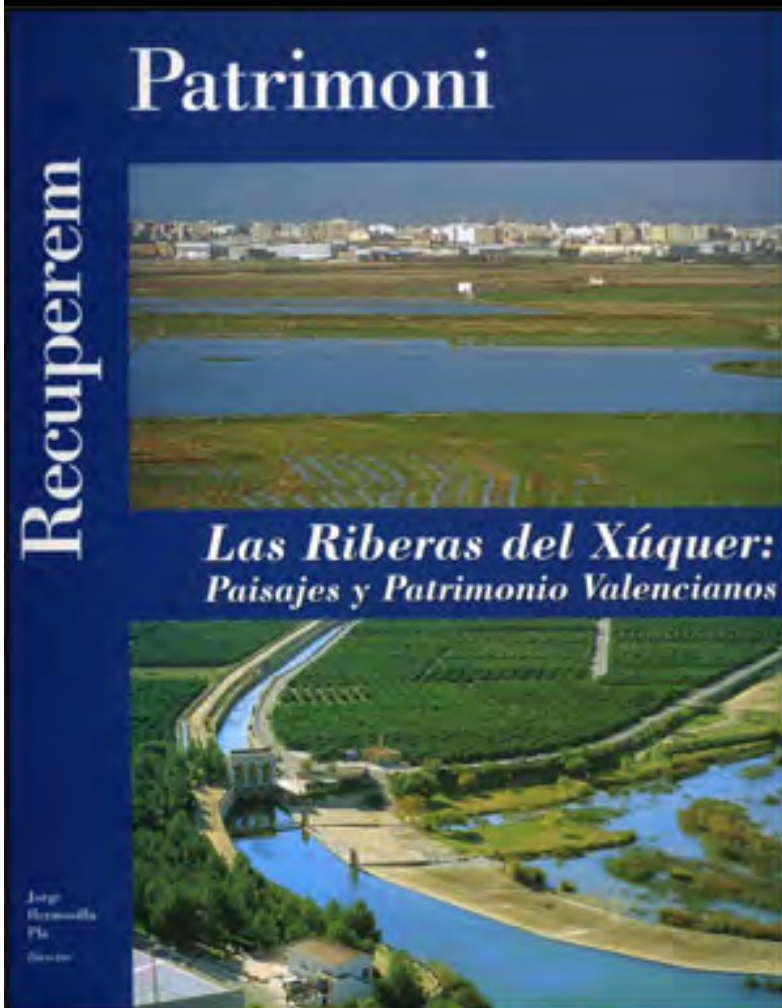
- RUTA DE L'AIGUA
- ITINERARI COMPLEMENTARI



[http://www.potries.org/upload/noticias/pdfs/22\\_FULLET%20VALENCIA.pdf](http://www.potries.org/upload/noticias/pdfs/22_FULLET%20VALENCIA.pdf)

The commitment of the  
researchers and the findings derived  
from their recent work.

The studies on the Valencian acequia culture have multiplied over the last twenty years.



An increasing number of researchers is getting deeply involved in the safeguarding of the Valencian acequia culture.



**Organiza:**  
CATEDRA ARZOBISPO LOAZES  
UNIVERSIDAD DE ALICANTE. SEDE DE ORIHUELA  
Y AYUNTAMIENTO DE ALBATERA

**Coordinador:**  
Dr. D. Gregorio Canales Martínez  
Director Académico de la Sede Universitaria de Orihuela  
Universidad de Alicante

Concedidos dos créditos de libre elección curricular a los alumnos de la Universidad de Alicante.  
La matrícula podrá realizarse a través del formulario electrónico de la dirección  
[www.ua.es/estudios/oa/orihuela](http://www.ua.es/estudios/oa/orihuela)  
o en las secretarías de la Universidad Histórica de Orihuela, Colegio Santo Domingo:  
C/ Adolfo Clavariano, nº 51, de 16 a 20 horas. Teléfono 966 73 30 41  
y del Centro Coordinador de Sedes Universitarias (Seus) Universidad de Alicante,  
edificio Germán Bernácer, de 9 a 14 horas. Teléfono 966 90 93 23

El plazo de inscripción finaliza el día hábil anterior al inicio del ciclo.

**Lugar de celebración:**  
CENTRO MUNICIPAL 3 DE ABRIL  
Plaza de San Jaime, 1. ALBATERA

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Dedicado a D. Juan José García Cánovas

**DEL 16 DE ENERO  
AL 20 DE MARZO DE 2007**

SÉPTIMO CICLO CURSO 2006-2007

Entorno

## Manifiesto por la vida del campo

01:46 ☆☆☆☆☆

 Tweet 0 Recomendar 0

Una treintena de instituciones, asociaciones y científicos firmaron el pasado 24 de noviembre el Manifiesto de Guardamar, un documento que aboga por defender y mantener los sistemas de riego tradicional como clave para el futuro ambiental, social y económico del campo de las comarcas del Baix Vinalopó y la Vega Baja del Segura.



[www.diarioinformacion.com/entorno/2009/12/02/manifiesto-vida-campo/957400.html](http://www.diarioinformacion.com/entorno/2009/12/02/manifiesto-vida-campo/957400.html)

**VICENTE LÓPEZ DELTELL** La firma, hace unos días, por parte de una treintena de entidades, asociaciones y científicos, del Manifiesto de Guardamar, trata de poner de relieve un problema del sur de la provincia de Alicante que está pasando desapercibido por la sociedad y cuya importancia ambiental, social y económica preocupa. La conservación de los sistemas de regadío de las comarcas del Baix Vinalopó y la Vega Baja del Segura entra así en un necesario debate "ante la constatación de la rápida degradación de estos enormes valores en los últimos años", señala el documento.

Entidades del campo del Baix Vinalopó y la Vega Baja defienden el riego tradicional como clave para mantener los ecosistemas asociados. DELTELL



**Academic acequia activism is spreading all over Spain.**

**un**  
**i** **Universidad**  
**Internacional**  
**de Andalucía**  
**A**

*Sede*  
*Antonio Machado*  
*Baeza*

(Código 3240)



**Curso**  
**El patrimonio agrario: la protección**  
**de vegas y huertas históricas en las**  
**áreas periurbanas**

**Del 28 al 31 de marzo de 2011**

[http://www.unia.es/images/stories/PATRIMONIO/TEXTOS/curso\\_patrimonio\\_agrario.pdf](http://www.unia.es/images/stories/PATRIMONIO/TEXTOS/curso_patrimonio_agrario.pdf)

[Beyond pointing out the many cultural and natural values of traditional irrigation, the new research reveals the magnitude of some of the general environmental services provided by the acequias]:

# Water pumping causes fatal quake

DEBORAH ZABORENKO



Last updated 10:12 24/10/2012

## Ads by Google

Empleo [www.DexKnows.com](http://www.DexKnows.com)

Encuentre servicios de empleo en el área de Albuquerque.

An earthquake that killed nine people in Spain last year may have been triggered by decades of pumping water from a nearby natural underground reservoir, suggesting human activities played a role in moving Earth's crust, scientists reported on Sunday.

The study, published in the journal *Nature Geoscience*, centred on the May 11, 2011, quake in the southern Spanish town of Lorca.

In addition to the nine deaths, this relatively modest earthquake of magnitude 5.1 damaged numerous buildings in Lorca, an agricultural centre.

<http://www.stuff.co.nz/science/7856497/Water-pumping-causes-fatal-quake>

# Professor Millán Millán has linked the reduction of traditional irrigation with the decrease of rainfall in the Mediterranean.

EL INSTITUTO NACIONAL DE METEOROLOGÍA CERTIFICA LA DISMINUCIÓN PROGRESIVA EN LOS ÚLTIMOS 50 AÑOS

## Los expertos auguran un 30% menos de lluvias en 10 años

El CEAM atribuye a la desaparición de marjales y al efecto invernadero

Según Millán Millán, progresivamente "se pasará de una media de 450 litros por metro cuadrado a 350 litros de media –un 30% menos–, que es más indicativa de áreas del norte de África".

Desde este departamento de investigación se atribuye esta tendencia tanto a las consecuencias del efecto invernadero como a la desaparición de muchas marjales y zonas húmedas por la presión urbanística. "Las tormentas de verano, para caer en las montañas de Castellón necesitan 14 gramos por kilo de humedad que proviene del mar y otro tanto que aportaban las marjales y las zonas de riego, que han desaparecido, este componente de las precipitaciones supone unos 100 litros/metro".

Este proceso de merma de precipitaciones –además de provocar que las masas de nubes descarguen al norte de los Alpes y haya inundaciones anuales en centroeuropa– incrementa la salinidad del Mediterráneo.

[http://www.elperiodicomediterraneo.com/noticias/castellon/los-expertos-auguran-un-30-menos-de-lluvias-en-10-anos\\_285112.html](http://www.elperiodicomediterraneo.com/noticias/castellon/los-expertos-auguran-un-30-menos-de-lluvias-en-10-anos_285112.html)

Most important, the rising awareness  
and commitment of the acequia irrigators.

# The irrigators of the Séquia de Mislata, one of the communities of the Tribunal de las Aguas, have created a foundation for the safeguarding of huerta lands.

## Los regantes de Mislata crean una fundación para preservar la huerta

La Comunidad de Regantes de la Acequia de Mislata, una de las integrantes del Tribunal de las Aguas de la Vega de Valencia, presentó la Fundació de la Comunitat Valenciana Séquia de Mislata para "preservar la huerta y del Tribunal de las Aguas de Valencia".

(2008-04-03 08:15:00)

Comentarios



El acto de presentación contó con la presencia del presidente del Tribunal Superior de Justicia de la Comunitat Valenciana (TSJCV), Juan Luis de la Rúa; el secretario autonómico de Agricultura, Vicente Ramírez; el director general de Justicia, Antonio Gastaldi; la subsecretaria de Gobernación, Juana María Forés; el director técnico de la Confederación Hidrográfica del Júcar (CHJ), Joaquín Andreu, el síndico de la Acequia de Mislata y presidente del Tribunal de las Aguas de Valencia, Ricardo Berenguer Vicent, y el secretario de la Acequia de Mislata y de la Fundació, Javier Pastor, entre otros.

Pastor explicó que la constitución de esta institución responde a "la firme convicción de los regantes de que su patrimonio, su cultura, su forma de pensar, de ver y valorar la vida deben de ser primero respetados", así como "admirados y luego preservados para el futuro, como ejemplo para las generaciones que están por llegar, e incluso por las que están y viven al margen de esta realidad concreta".

<http://www.diariocriticocv.com/noticias/los/regantes/de/mislata/crean/una/fundacion/para/preservar/la/huerta/not254758.html>

Source <http://www.carrizales.es/>

The community of irrigators of Carrizales is promoting the setting of a Natural Agrarian Park in their irrigated lands in Elche.



## En defensa del medioambiente en Carrizales

23.02.2013 | 01:33

Anillamiento de aves y restauración de un azarbe. Voluntarios de la Asociación de Naturalistas del Sureste (ANSA) y de la Asociación de Amigos de los Humedales del Sur de Alicante (AHSA), junto a miembros de la Comunidad de Regantes de los Carrizales, han participado en los últimos días en sesiones de anillamiento de aves paseriformes en la charca de Carrizales. Además, la delegación también ha procedido a la restauración de un azarbe en el entorno del humedal creado recientemente. La intervención ha consistido en la plantación de medio centenar de árboles, con especies como los álamos blancos.



En defensa del medioambiente en Carrizales

Source : <http://www.diarioinformacion.com/elche/2013/02/23/defensa-medioambiente-carrizales/1346786.html>

**As a conclusion, I would only say...**



!!!Que vivan  
las acequias!!!



**DEFENSEM  
L'HORTA**

Source: <http://perlhorta.blogspot.com.es>