

# A short history of the water and society in the region of Vélez Blanco, East Andalusia

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Received: 30 September 2014 / Accepted: 10 June 2015 / Published online: 23 June 2015  
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**Abstract** The network of irrigation canals and reservoirs in the Los Vélez region in Southern Spain has existed for centuries and is documented as tangible cultural heritage. But the region's 'water culture' also has an intangible aspect that involves water-related management, conflicts and jurisdiction. This paper traces the water-related history of the city and region of Vélez Blanco from the Muslim period through the medieval era and later centuries until today, and embeds it in the development of legal history and the jurisdiction of water issues. We conclude with a reference to the twenty-first century and the value of historical and archival sources, as well as an appeal to found a museum and add the region to the list of UNESCO World Heritage sites.

**Keywords** Water management · Los Vélez · Water courts · Irrigation · Conflicts

## Abbreviations

ADMS Archivo Ducal de Medina Sidonia  
AHPA Archivo Histórico Provincial de Almería  
AMVB Archivo Municipal de Vélez Blanco

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APVB Archivo Parroquial de Vélez Blanco  
 ARChGr Archivo de la Real Chancillería de Granada

*El agua caliente más que el vino.  
 Water heats up more than wine (proverb from Vélez Blanco).*

## Introduction

It is commonly held that water has a high conflict potential wherever fresh water is scarce and an unevenly distributed resource. In Spain, the challenging task of water allocation among stakeholders has given rise to localised organisations and legal institutions, many of whose origins can be traced back to the Muslim period (Boelens and Post Uiterweer 2013; Gerrard 2001; Glick 1970). Among them is the irrigation community of Vélez Blanco in dry/sub-humid southeast Spain (Fig. 1), where a prehistoric cultural landscape rich in spring water was cultivated with arable crops. This paper sets out the dynamic history of the irrigation community, based on documents from the sixteenth to the twenty-first centuries in the local and regional archives. The focus is the history of the legal institutions and the conflicts within and between neighbouring communities that have arisen over water allocation issues. The paper concludes with an appeal to include the legal institutions on the UNESCO World Heritage List.

## Background and comparative studies

In Spain, the technical advancement and institutionalisation of water management can be traced back to prehistory (Gilman and Thornes 2014). Irrigation systems experienced a



**Fig. 1** Topography of south east Spain, with the main municipalities and rivers. Highlighted is the comarca of Los Vélez (dotted line) and city in focus Vélez Blanco (red star) (data source Centro Nacional de Información Geográfica)

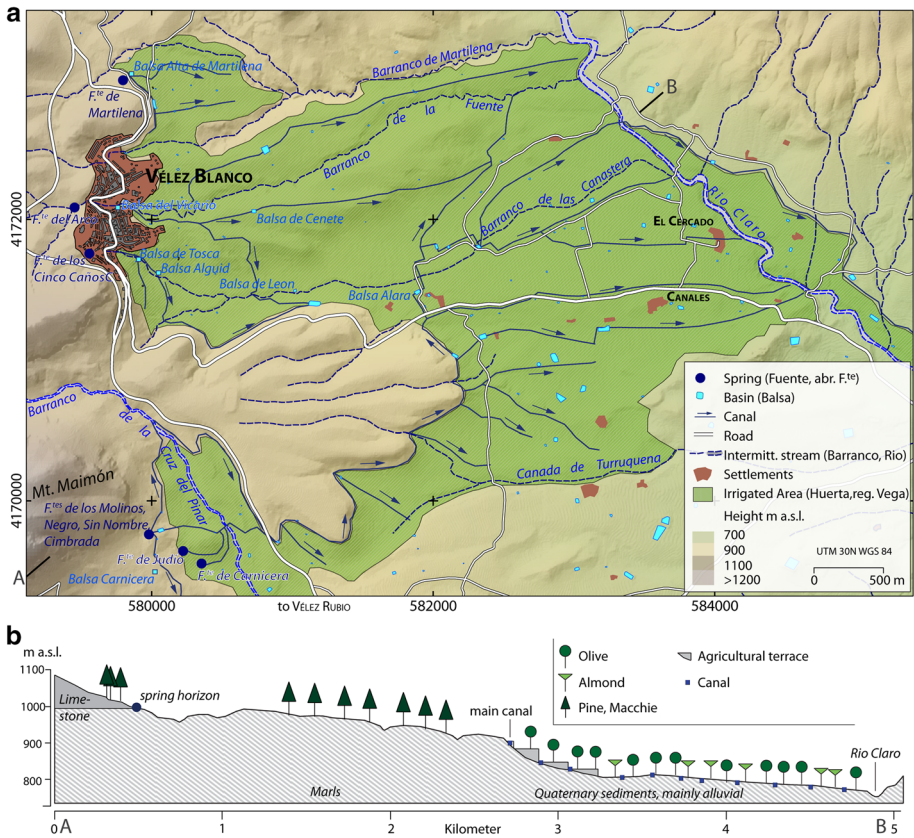
technological revolution and spatial reorganisation during the Muslim period, beginning with the Arab rule in the eighth century (Boelens and Post Uiterweer 2013). Today, a variety of transformations within the administration, organisation and jurisdiction of autonomous and municipally controlled irrigation communities can be observed throughout modern Spain, although locally, the legal relationships between land, owner and water law can vary considerably. For example in the communities of Valencia and Castellón, water and land are inextricably bound to each other, while in the communities of Alicante and Elche, it is possible to sell water rights independently of the land (Glick 1970).

Radical changes to the irrigation systems implemented during the Muslim conquest by the Berbers and Arab settlers occurred during the Christian Reconquista in the medieval period. Particularly in central Spain, the majority of irrigation communities were expropriated and the form of ownership was transferred to lordship. In 1492, Andalusia, which encompasses the former kingdom of Granada, was finally re-conquered by the Christians. They seized the land from royal and noble Arab families and redistributed it (Fischer 2000). In several regions of Andalusia, the established irrigation systems from the Muslim period actually expanded during the early modern period (c. 1600–1800) and water tribunals based on the Valencian model were established. For example, the water tribunal of Granada was held for a period of more than 300 years before it was finally dissolved in 1835. Since that time, water law has been part of the civil law system. In contrast, the local water tribunal of Valencia is still active to this day (Fischer 2000). Several examples show that during the early modern period, the traditional Islamic irrigation systems in Andalusia were retained and even expanded on a local basis (Gerrard 2001).

The example of the Guadalhorce Valley located in the province of Málaga represents an impressive case of the deconstruction of traditional irrigation knowledge through the nationalisation of water management in recent history. The Guadalhorce Valley example can be applied to wide areas of Spain. Beginning in the Muslim period, the Guadalhorce water resources were allocated by an increasingly a complex system in which land, people and agricultural production were organised in strictly defined structures that considered the needs of all the local residents connected to the irrigation system (Boelens and Post Uiterweer 2013). Locals—who possessed the necessary knowledge of the local climate and soil conditions and had extensive experience as irrigators—managed the self-organised community. These structures were implemented during the Umayyad conquest of Hispania and outlasted the Christian re-conquest. In the late nineteenth century, many smallholder irrigation communities were replaced by large-scale water management systems (Boelens and Post Uiterweer 2013). The program's primary aim was to improve the social situation in rural areas by increasing the quantity and quality of agricultural production, redistributing farmland and adjusting regional imbalances. It was also designed to strengthen decentralisation and autonomy with the reorganisation of water allocation. In fact, this program destroyed the traditional water management structures and with them, knowledge, techniques and jurisdiction that had successfully operated for centuries. In contrast to the 'bad practice' case study of the Guadalhorce Valley, this paper documents an uninterrupted irrigation history: in the vicinity of Vélez Blanco, the irrigation community administration is a functioning system that has existed at least since the Muslim period.

### **Land use in the *vega* of Vélez Blanco and its environmental settings**

Although it had a population of more than 8000 during its heyday in the nineteenth century, today Vélez Blanco is a village of 2500 inhabitants. Located in eastern Andalusia, in the province of Almería, it is the second largest settlement (after Vélez Rubio) in the



**Fig. 2** A The Vega of Vélez Blanco. Highlighted are hydrological features like the major springs (blue dots) the main canals and the eight historically important balsas (light blue). Most of the unnamed balsas are of modern age. B Cross section from A to B showing the spring horizon and the underlying geology as well as the predominant vegetation and crop type (data source Centro Nacional de Información Geográfica)

county<sup>1</sup> of Los Vélez (Fig. 1). The region is located in the headwater area of the *Rio Guadalentín* drainage basin. The annual rainfall in the lowlands of the *Guadalentín* drainage basin averages approximately 300 mm; while in the high mountain areas these values exceed 1000 mm locally (Geiger 1970, Fig. 3). The high mountain areas with altitudes over 2000 m AMSL were created by Jurassic thrust blocks and are primarily composed of limestone (Geiger 1970). These high mountain areas—i.e. the *Sierra de Maria* and *Sierra de Gigante* in Comarca de los Vélez—function as the water towers for the region, feeding the numerous springs of the area which mostly emerge from the zone in which the thrust limestone faults over the Cretaceous marls (Schütt 2001) (Fig. 2B). The downslope of this spring horizon is located in the irrigated area (Span. *huerta*) of Vélez Blanco. Locally, this area is also called *vega* (Span. for valley floor). Canals lead the water from tapped springs to the open basins (Span. *balsas*) from which the water is distributed to

<sup>1</sup> The *Comarca de los Vélez* (Los Vélez County) comprises an area of about 1000 km<sup>2</sup> and forms the northern part of the province Almería. Its modern territory is almost the same as it was in late medieval times.

the individual fields via a complex canal system (Figs. 2A, 4). Olives are traditionally cultivated on the terraced slopes, while the farmers cultivate fruits and vegetables closer to the built-up areas. In recent years, increasing numbers of almond trees have been planted in the upslope areas and pig farms have been built throughout the *vega*. As the distance to the mountain springs increases, land use is dominated by rain-fed arable land where grains such as barley and oats are cultivated.

## Documentary sources

Although water-related issues were traditionally resolved verbally, the discovery of numerous documents—notarial deeds in particular—has revealed various new aspects of the water culture of Vélez Blanco. They include purchase and lease agreements, wills, powers of attorney and documents establishing primogeniture or awarding chaplain benefices (AHPA, Prot. 3136; 11/28/1672). In the nineteenth century, the end of the old monarchy resulted in the loss of many documents due to jurisdictional restructuring, the loss of archives during the populist revolt of 1874 and theft. One of the most important written records for the irrigation history of Vélez Blanco was among these documents: “*Libro del Agua e Repartimiento de las Haciendas desta a cargo del Fiel del Alporchon desta villa*” (AHPA, Prot. 3008, October 1605). This documents record transfers of ownership from a social and economic point of view. The transactions cannot be traced without them, since only a few were notarised. This particularly applies to the period prior to the expulsion of the *Moriscos* in November 1570 (AHPA, Prot. 3041; 1/11/1628). Water purchases were documented in the *Libros del Alporchón*, which go back to the nineteenth century (AHPA, Prot. 8718; 6/18/1861 and Prot. 8838; 6/22/1885).<sup>2</sup>

## From Muslim rule to feudalism

### The territorial army asserts its banal rights

The transformation from a Muslim society to a feudal one took a long time: Vélez Blanco functioned as one of the most important communities in the 3300-km<sup>2</sup> county of Los Vélez for over three centuries. The sixteenth century was especially dynamic in this region.<sup>3</sup>

The legal texts of Muslim scholars (Arab. *fatwas*) from Spain and northern Africa between the eleventh and fifteenth centuries CE and the cadastres (*Libros de Repartimiento*) that were instituted after the Christian re-conquest imply that only the higher courts negotiated the irrigation rights installed during the Muslim period. Instead, irrigation rights were installed as joint possession (Span. *pro indiviso*) by the local society and most conflicts were solved in local assemblies (Span. *aljama*).<sup>4</sup>

After the integration of the kingdom of Murcia into the kingdom of Castile (1243/66), the region of Los Vélez (located in the kingdom of Granada) became a border region for 245 years. This restless period led to the abandonment of 15 hamlets in the *vega* of Vélez Blanco.

<sup>2</sup> For information on the meaning of *Alporchón*: Trillo San José (2009, p 241).

<sup>3</sup> On the political, social and economic history of Vélez Blanco in the sixteenth century: Roth (2008).

<sup>4</sup> Trillo San José (2009, pp 29–216).

On 24 July 1503, Queen Isabella I granted Don Pedro Fajardo, Margrave of Los Vélez, the rights to *aguas estantes e corrientes*, effective from 12 September 1507.<sup>5</sup> To promote settlement activity, the first margrave of Los Vélez ordered 10,000 *tahullas* to be planted with grapevines (1 *tahulla* = approximately 1100 m<sup>2</sup>). This led to a conflict with the city of Lorca, which felt that its right to water originating from the county of Los Vélez was being threatened. The margrave engaged in disputes with neighbouring communities and his own vassals over territorial and access rights in subsequent decades (ADMS, Legajo 444, carta 10). Acting on the basis of banal rights, the margraves of Los Vélez had free disposal over forests, barren land and bodies of water. They awarded plots of land, permitted forest clearance and assigned water rights in return for the payment of a perpetual tax, even when these sometimes-public resources were “*y aguadero concejil para los ganados*” (AHPA, Prot. 3246; 8/27/1731 and 11/2/1731; AHPA, Contaduría de Hipotecas 10832, 6/2/1769).<sup>6</sup>

In accordance with the royal privilege from 14 October 1501, the water and land rights that previously belonged to Muslim charities (Arab. *habous*, Span. *bienes habices*) were awarded to the Church, which granted long-term leases on them—for three generations at a time—until the mid-nineteenth century (García Sanjuán 2002; Roth 2015). The local council owned water holdings (Span. *Hila del Concejo*) that were leased and even sub-leased to third parties to generate revenue. The value of leased water and land rights jumped between 1676 and 1836 (from 250 *reales* per year to 2950 *reales* per month) (AHPA, Prot. 3153; 2/4/1683; Prot. 3146; 2/17/1676 and Prot. 3368; 2/5/1836).

The irrigation practices during the Muslim period were documented by the Morisco Alonso Palomar, who gave his son-in-law ‘one night of water’ as a present, to be used on the ninth day of a 20-day rotation (AHPA, Prot. 2958; 8/10/1578).<sup>7</sup> Likewise, Juan Bautista del Prado, a priest from a Morisco family, leased undeveloped fields to a new settler on the condition that each year, five *fanegas* of new land had to be made arable.<sup>8</sup> (AHPA, Prot. 2933; 11/1/1582). Outstanding technical innovations such as *the artificios de Juanelo*, two devices constructed in the sixteenth century to supply the city of Toledo with water, were also known in Vélez Blanco. This is documented by the 1561 testimony of the cleric Antonio de la Bastida, who was accused of blasphemy by the Inquisition. In reference to a

<sup>5</sup> On the origins of the margraviate: Franco Silva (1995) (the text of the deed of enfeoffment: 273–301); on the geography, history, monuments, ethnography, etc. of Vélez Blanco: Roth et al. (2001), Navarro López et al. (2012) (see also the bibliography up to May 2012).

<sup>6</sup> For more information on the reclamation of the land after the incorporation to the crown of Castile, see: Trillo San José (2012).

<sup>7</sup> A 1661 lawsuit addressed the sale of irrigation rights to new settlers with reference to the nightly irrigation rotation del “Leila” as follows: “de tiempo ymemorial a esta parte en posesion de regar como herederos del pago de Caguid y sus heredades con Leila, sobras y Rio y de comprar el agua de otros y rio para las heredades que no la tienen libremente y sin contradizion a los tiempos que la hubieren menester era asi que los alcaldes de aguas que de presente eran en esta villa por auto abian mandado que el agua del Rio que ba de noche que no se sacase de las heredades a questaba repartido e ympedian el regar las heredades de dicho pago de Caguid quando los pobladores desta villa lo vendian para otros pagos y que de ympedirles se perderian las biñas deste dicho pago” Translation: “Since time immemorial and until today, we as bearer of irrigation rights and properties in the parish Caguid and possessor of the Leila, Sobras and Río (Authors note: those are different irrigation rights), buy, without contradiction, water from others and from the Río for those properties which cannot dispose of it freely and at the times when they need it, and so it has been ordered by the Water-Alkalden who holds the office in the community by a declaration which states that the water of the Río, which flows at night, shall not be extracted from the properties which are apportioned to it, and that it shall be prevented that the properties of the parish Caguid, if the new settlers would have bought it for another parish and if this would be prevented, that the vineyards of this parish would desiccate desolate” (AHPA, Prot. 3120; 3/31/1661).

<sup>8</sup> “encanando el agua de manera que le haga su escorridores”.

dispute over land usage rights, he said: "... *no a de subir estos con fuerça a suvir la lavor como el agua de Toledo.*"

Water was sold, leased or auctioned, but it could also be received as unsalable. This is shown by a testament from 1618, where a testator permits three neighbours to build a reservoir whose impounded water could be used for irrigation in a 3-day rotation. He also decreed that in perpetuity, the fees for his water share had to be used to read a requiem mass and vespers on Michaelmas Eve (AHPA, Prot. 3027; 1/3/1618). The water in a reservoir could also be earmarked for the material endowment of a chaplain appointment, as an example from 1673 shows (AHPA, Prot. 3146; 8/13/1673).

### The *Alporchón* and water allocation during the old monarchy

Even today, one of the most important institutions for the citizens of Vélez Blanco is the *Alporchón*, a common law body that manages irrigation water and maintains the infrastructure for distributing and storing the water. It has existed since the Muslim period. The *Alporchón* also owns the water rights of the springs that have their source at the foot of the southeast slope of Mount Maimón, a 1762-m-high mountain in the municipal district of Vélez Blanco (Fig. 3). These springs irrigate 1071 ha of land with 713,321.5 m<sup>3</sup> of water each year (Navarro Sánchez 2010).<sup>9</sup> The water is temporarily stored until it is used for irrigation. One example of a temporary storage unit is *Balsa Alhara*, an irrigation basin with a maximum capacity 288 m<sup>3</sup> (corresponding to 6 *arrobos* or 48 *granos*)<sup>10</sup> located in the pasture land of Vélez Blanco. Water is fed into *Balsa Alara* from 6 p.m. until 6 a.m. and then distributed through channels (Span. *brazales*) to the individual fields the next morning. Today, eight larger irrigation basins exist in the *vega* of Vélez Blanco (*Alhara*, *Alguid*, *Balsa Alta*, *Balsa Baja*, *Carnicera*, *Cenete*, *León* and *Vicaria*). Their content is measured in terms of volume, while the *hilas* (Span. for time units of water) (*Cenete*, *Tosca*, *Turruquena*, etc.) are divided up based on time. Another reference to the Muslim period is to be found in the practice of *jarique* (from the Arab. *sarik*, Engl. comrade), in which quantities of water belonging to multiple owners are united in a canal and used by the owners for irrigation until the total quantity is exhausted (AHPA, Prot. 3027; 2/4/1618).

The *Libro Becerro*, a volume compiled in 1635 containing all of the margrave's feudal privileges, mentions that water from the irrigation basins and *hilas* is auctioned in so-called *fallas* (Span. for water auction). This is still practiced today. In earlier times, the revenues were used to pay for the water trustee (Span. *fiel de aguas*), the bellman, the guardsmen, the cleaning of the irrigation reservoirs, the maintenance of the *qanats* and aqueducts, war contributions, alms to religious brotherhoods, the repair of a city gate, the chapel of St. Augustine and the purchase of church bells and clocks (as recently as the 1950s), as well as the intercessory masses during a plague of locusts (AHPA, Prot. 2953, sin foliar).

Following the verdict of the Royal Court of Granada in 1578, the margrave established the city council and other dignitaries and functionaries, including two *alcaldes de aguas*. This met a

<sup>9</sup> This data refers to the four springs in the immediate vicinity: *Principal o de los Molinos*, *Negro*, *Cimbrada* and *Sin Nombre*, according to the Confederación Hidrográfica del Segura (CHS), Resolución de la Comisaría de Aguas of April 3, 2003 (Reference Number IPC-122/1988). The inspection took place on 21 May 2001, and the documents contain clear references to the Muslim traditions: rerouting of water at sunset, the importance of Friday with the effect on the Saturday or seasons. The *Fosque* and *Judío* springs are not affected by the division between the communities of Vélez Blanco and Vélez Rubio, and each year they fill 1,292,976 cubic metres (CHS, Reference Number IPC-136/1988; on-site inspection: 6/19/2002).

<sup>10</sup> On the derivation of the unit *grano* from the Arabic *alfaba*, see: Navarro Sánchez (2010, p 342) and: Martínez, p 134.



**Fig. 3** Eastward view over Vélez Blanco with the Sierra de Gigante in the background

requirement that had been formulated in a memorandum from 1577 regarding new settlers (ADMS, Legajo 509 and AHPA, Prot. 2957; 6/30/1577). Vidal Castro (2008) understands the *alcaldes de aguas* as water arbitrators in the sense of the traditional legal concept of *Qadi l-miyah*, also known in places such as Lorca, Alcalá la Real, Alcaudete, Cazorla, Guadix, etc. The earliest evidence of an *alcalde de aguas* in Vélez Blanco dates to 1542 and refers to the Morisco Hernando Alcadi (AHPA, Prot. 7906; 4/12/1542). According to the *Libro Becerro*, the *alcaldes de aguas* were responsible for the lower jurisdiction of the water administration and taking civil and criminal action against people who cheat or violated the water decree. Although most of the case files were lost, the surviving documents indicate that water theft was a frequent source of complaints. Furthermore, the *alcaldes de aguas* ensured that the primary and secondary canals were cleaned, initiated the maintenance of the irrigation system (e.g. *qanats*, canals and aqueducts) and could conduct auctions and sell water to cover expenditures on community-related costs. The *alcaldes de aguas* did not have a seat on the council nor did they perform the function of a judge. They did not have a fixed wage; instead, they earned six *reales* per day when on an assignment.

A post that still exists today and is mentioned in documents from the Muslim period is the *fiel de aguas* (Arab. *amin al-ma*; literally, water trustee), a subordinate public official (Vidal Castro 2008, p 184). The *fiel de aguas* was responsible for monitoring weights and measures, as indicated in a 1657 report from Vélez Blanco (AHPA, Prot. 3116; 1/28/1657). There is also evidence from 1627 of the *sobreacequero* (Arab. *sahib al-saquiya*; literally, irrigation official), who was charged with caring for the infrastructure required for water distribution (AHPA, Prot. 3039; 1/24/1627).

The responsibilities of the irrigation reservoir guards (Span. *balseros*) are recorded by contracts drawn up by notaries (AHPA, Prot. 2936; 4/14/1591; Prot. 2930; 11/22/1579 and Prot. 2939; 12/31/1589). The reservoir guards went on strike in 1596 due to unpaid wages. Thereafter, their payment was based on the auctioning of water (AHPA, Prot. 2940; 4/16/1596).

Finally, a public bellman (Span. *pregonero*) was responsible for implementing the *Alpochón* of Vélez Blanco on a yearly basis and each morning he had to proclaim the irrigation cycle as specified by the *fiel de aguas*. The revenues from water auctions, new settlers, income from communal inns and taxes covered his remuneration (AHPA, Prot. 2932; 7/26/1581; Prot. 2033; 9/19/1582 and Prot. 2935; 1/16/1588).



## Water-related conflicts

### The new settlers and the expulsion of the Moriscos

In December 1571, the Royal Court of Law in Granada despatched the examining magistrate Antonio de Medrano to Vélez Blanco. His task was to compile a cadastre of the former Moriscan properties, which also included water rights and sources. Supported by local Moriscan experts, he compiled detailed records on the distribution of spring water between the municipalities of Vélez Blanco and Vélez Rubio (Roth 2008). Philip II issued a forced resettlement decree in 1570, but Don Luis Fajardo, the second margrave of the county of Los Vélez, reserved the royal privilege of retaining 30 Moriscos and their families on his property in Granada. Among these Moriscos were experts on water rights and construction techniques, including a specialist (Arab. *seyse*) named Juan Guaharil, who had built a *qanat* on the outskirts of Vélez Blanco and thereby obtained land usage rights for the newly irrigated land for a period of 4 years (AHPA, Prot. 2934; 7/17, 7/18 and 8/23/1583).

The Royal Court of Law in Granada decreed that the municipality of Vélez Blanco had permission to act to the king's approval: establishing standards and regulations for agriculture, animal husbandry, beekeeping, food inspection, forest usage, milling and irrigation (Roth 2002). In July 1593, Jorge de Baeza, the inspector of municipalities of new settlers, prohibited the sale or auctioning of water belonging to new settlers in Vélez Rubio. The mayor of Vélez Blanco violated this prohibition within a month (AHPA, Prot. 2946; 7/19/1593). In 1627, the new settlers from Vélez Rubio complained that the native citizens had assigned the water rights attached to the properties of the Moriscos and included themselves in the irrigation rotation every 8 days, while the new settlers were only included for a total rotation of 13 days. The native citizens argued that this practice was traditional and that the Moriscos had taken a *Condac*, a book containing the irrigation rights, into exile (Palanques 1909). In 1661, the descendants of the new settlers in Vélez Blanco complained that the rich and poor were treated differently when it came to dividing up the burdens and costs of maintain the irrigation system. Delaying tactics and appeals to every appellate court forced the—typically poor—petitioners to withdraw their lawsuit (AHPA, Prot. 3122; 5/20/1663 and APVB, Censos). Herd owners also regularly defended their claims to free access to watering places (AHPA, Prot. 3064; 8/11/1625). In summary: Apart from disputes over herds of sheep and goats trespassing on farmers' fields, disputes over water were the most frequent cause of controversy.

### Water use conflicts between Vélez Blanco and Vélez Rubio

In the period prior to 1932, the two municipalities filed multiple lawsuits over water use rights and the cleaning and maintenance of springs and distribution canals. The first margrave had hired a Moriscan councilman, Don Pedro de Luna from the town of Purchena, as his counsellor. De Luna confirmed that the municipality of Vélez Rubio had the right to use the water "...from Friday at dusk and should use it until Sunday at dusk". Furthermore, all of the water from the extant *Molino Bermejo* watermill, located on the eastern footslope of Maimón Mountain to the south of Vélez Blanco, was diverted to Vélez Rubio. Both communities presented contracts written in Arabic (Span. *en arabigo*) and Don Pedro de Luna gave his expert opinion based on Islamic law.<sup>11</sup> Despite the

<sup>11</sup> *Compendio de lo contenido en la Real Ejecutoria que ganó la villa de Vélez Rubio contra la de Vélez Blanco en el asunto de las aguas del Maimón* (typewritten). Detailed description of the division of water between the two communities in: Ortiz Soler et al. (1992).

intervention of the counsellor, the conflicts between the municipalities of Vélez Rubio and Vélez Blanco did not stop (AHPA, Prot. 2986 and 3152, 7/14, 7/22, 8/21 and 8/25/1605). In a case submitted to the royal court in 1732, reference was made to a judicial order that specified how much water was to be allotted to the municipality of Vélez Rubio on which days and for how many hours. The case also referred to ‘amicable agreements’ (Span. *escritura de concordia*) that had been agreed upon between the two municipalities in August 1685 to perpetuate collaboration and peace (Span. *para mantener la correspondencia y paz que es devida*) (AHPA, Prot. 3220; 11/5/1732). This agreement from 1685 included the springs on the eastern slopes of Maimón Mountain and regulated how the irrigation canals were to be cleaned without metal tools. The obligations resulting from this agreement and the additional agreement between the two municipalities from 29 August 1748 concerning the water from the *Fuente de la Higuera* spring are still binding today (AHPA, Prot. 3152; 8/25/1685). By the beginning of the seventeenth century, the two parties had agreed that the water distributors (Span. *arcas*) and their feeder sluices should be permanently covered (AHPA, Prot. 3042; 2/12/1628).

### Conflicts related to the expansion or modification of the irrigation system

Any modification of the infrastructure for latching or distributing irrigation water and therefore, the building or rerouting of irrigation canals, could quickly result in a legal dispute (AHPA, Prot. 3006; 7/30/1629, Fig. 4). During the eighteenth century at the latest, the increase in the amount of arable land resulted in the need to expand the network of canals and exploit the hitherto underused water resources. In turn, some of the resulting disputes referred to the longstanding conflicts between native citizens and new settlers.<sup>12</sup> Some of the initiators of projects like these referred to Article XLVIII of the Royal Edict from 15 May 1788.<sup>13</sup> Frequently, these conflicts were related to the routing of the newly designed irrigation canals across third-party fields (AHPA, Prot. 3231; 4/24/1747; Piar). The rights and duties of the people involved in adding value to new farmland by expanding the irrigation system were partially specified in written form and notarised.<sup>14</sup>

Since the mid-eighteenth century, constant population growth and the expansion of grain cultivation had motivated wealthy citizens to invest in the construction of watermills administered by the margraves of Los Vélez upon prior approval (AHPA, Prot. 3318; Julio de 1790). The infrastructure for watermill operation was continuously improved, as can be deduced from a 1770 project designed by the municipality of Vélez Rubio that involved the direct routing of water from the *Fuente del Marqués* to a new watermill through a tunnel (ADMS, Legajo 2067). Drainage tunnels were also built to make water from the alluvial infills of the *Rambla de Chirivel* available (AHPA, Prot. 3326; 2/24/1799).<sup>15</sup> Local

<sup>12</sup> AHPA, Prot. 3219; 10. and 9/19/1732 (Estrecho de Almadique/Deerde); AHPA, Prot. 3292; 5/21/1818 („aprovechamiento comun a todos de la corta porcion de agua existente”).

<sup>13</sup> AHPA, Prot. 2999; 2/21/1619 (spring discharge); Prot. 3067; 9/24/1629 (wells); Prot. 3026; 9/29/1617 (building of a reservoir); Prot. 3194; 6/3/1707; Prot. 3241; 14/9/1722 and Prot. 3262; 5/13/1763.

<sup>14</sup> AHPA, Prot. 3334; 5/3/1807 (Piar) and Prot. 3197; 6/9/1708 (well and canal on Mt. Gabar: „para hacer la toma de dicha agua para poder regar con ella, han de concurrir todos estos otorgantes sin que ninguno pueda tener excusa”). Translation: “To channel the water for irrigation, all of the signees of the deed have to attend without excuse”).

<sup>15</sup> A colour blueprint of this project survives in the archives of the dukes of Medina Sidonia. Order from 1788: „es muy conveniente facilitar la fertilidad de los campos con el aprovechamiento de todas las aguas que puedan aplicarse a su beneficio, y para lograrle procurarán que se saquen acequias de los ríos, san-grándoles, por las partres más convenientes [...] cuidandio igualmente de descubrirles subterráneas para



**Fig. 4** A typical irrigation canal in the Vega of Vélez Blanco, which conveys water from an *upper* to a *lower* olive field. The former earthen canals were renewed with concrete modules in the 1960s

oligarchs attempted to privatise water from public fountains such as *Los Cinco Caños* for their own use (AHPA, Prot. 3300; 7/4/1770). These projects, too, led the persons affected to initiate lawsuits (AHPA, Prot. 3319; 11/29/1791). The conflicts primarily arose when obligations to maintain the infrastructure were neglected and sometimes resulted in defamation and fisticuffs (AHPA, Prot. 3161; 12/29/1692 and Prot. 3192; 2/15/1704). Several of these disputes were brought before the Supreme Royal Court in Granada (ARChGr, Cabina 512, Legajo 2.352, Pieza 3 und Cabina 21, Legajo, 2134, Pieza 14).

### **The Liberal Nation State and the irrigation communities of the nineteenth century**

Subsequent to the failed attempts to establish the first Spanish constitution in 1812 and the Liberal Triennium (1820–1823) and after the death of Ferdinand VII (1833), the Spanish state administration commenced to modernise and centralise. This included the establishment of judicial districts (1834), the abolishment of feudal rule (1837), the establishment of primogeniture (1841), the introduction of a perpetual tax on the estates of expelled Moriscos (1845), the privatisation of inalienable assets and the secularisation of church properties (beginning in 1837, but especially in 1855), and the creation of land registries (1863). The agreements concerning the forested area and the usage of forests that were also concluded between the margraves and municipalities of the county of Los Vélez and the Spanish state (1858–1900) had a major impact on erosion processes and reforestation measures in the Los Vélez region (Roth 2011). The introduction of free trade in the nineteenth century led to numerous new water-powered grain and fulling mills. In 1800 in the municipal district of Vélez Blanco, there were three watermills, but 44 water and six

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Footnote 15 continued

servirse de ellas, así en el uso de molinos, batanes y otras máquinas necesarias y convenientes a las moliendas y al beneficio de las lanas”. Translation: “It is appropriate to promote the fertility of the fields by the use of all of the available water and to achieve this, they want to tap the rivers where suitable with canals [...] and by keeping in mind to use the groundwater for the operation of the mills, for fulling wool and other machines which mill or are appropriate for processing wool.”.

fulling mills were operating in the same area by 1850. The newly installed watermills were constantly modernised as a result of technical improvements, including the construction of vertical mill wheels that were up to 17 m in diameter. In 1884, the watermills in the municipality of Vélez Blanco were milling up to eight tonnes of grain daily (Ortiz Soler et al. 1996; Madoz 1988; Roth 2013).

From 1837 to 1903—after the end of feudalism—water rights were managed by the *Junta de aguas del Maimón* (c.f. Navarro Sánchez 2010). The privatisation and standardisation process is reflected in the water laws revised in 1866 and 1879 (Gaceta de Madrid 8/7/1866 No. 219; Gaceta de Madrid 6/19/1879, No. 170). The revised law from 1879 mandated the establishment of irrigation communities with their own statutes and standards for public water resources used by the community. For the irrigation communities in Vélez Blanco, these statutes (Span. *ordenanzas*) were approved by royal decree on January 18, 1902 and constituted at the Vélez Blanco town hall on April 8, 1903. Still valid today, the statutes include the establishment of an assembly of the owners of water rights (Span. *asamblea*; legislative), a managerial board (Span. *sindicato*; executive) and a jury (Span. *jurado de aguas*), who were tasked with addressing all issues that might arise concerning usage rights and holding violators accountable (Pérez Picazo 2001). The proceedings were public and punishment was limited to fines. This jury corresponds to Article 125 of the Spanish constitution, which recognises the common law and traditional courts of Spain. It was intended to have a status similar to the one accorded to the *Consejo de Hombres Buenos de Murcia* in Article 19, Paragraph 4 of the *Ley Orgánica del Poder Judicial* (Engl. Act of Parliament Governing the Judiciary) from 1999 and was confirmed by the first chamber of the Spanish Supreme Court in a judgment from 12 July 2004 (Navarro Sánchez 2010, p. 351).

Article 32 of the statute of Vélez Blanco on the establishment of the *Alporchón* reads “... *habrá un Alporchón en esta villa, como de inmemorial existe*” (“... shall there be an *Alporchón* in this municipality, just as there has been since time immemorial.”). In today’s *Alporchón*, the clerk of the *sindicato* and the *fiel de aguas* announce the irrigation rotations for the following day on a daily basis.<sup>16</sup> Whereas in the *Alporchones* of Lorca<sup>17</sup> and Vélez Rubio ownership rights for land and water are separate, water and land ownership are linked in the *Alporchón* of Vélez Blanco.<sup>18</sup>

During the Second Republic (1931–1939), in Vélez Rubio the accumulation of power over water resources in the hands of a few oligarchs provoked thoughts of disappropriation and the redistribution of water rights. On 1 January 2011, the municipality of Vélez Rubio finally purchased all the rights and assets of the irrigation community in the municipality for the sum of €529,999.71.<sup>19</sup>

Chapter I of the statute designates the eleven water distributors (Span. *arcas*) and the *Balsa Alhara* reservoir as an assets of the irrigation community, specifying the usage rights for the following volumes of water:

<sup>16</sup> This is planned take place at 7 a.m. from 3/21 to 9/20 and at 8 a.m. for the rest of the year.

<sup>17</sup> Since 25/3/1960 in Lorca and 1966 in Mula, no more water auctions have been held (Navarro Sánchez 2010, p 355).

<sup>18</sup> In his *Historia Natural del Reino de Granada, 1804–1809*, the natural scientist Simón de Rojas Clemente wrote of the different customs in Vélez Blanco and Vélez Rubio: “Las aguas se reparten luego que se expulsaron los Moriscos entre los nuevos Pobladores, pero en Vélez [Rubio] nadie vende la tierra con riego, así los dueños de las aguas son diversos de los dueños de la tierra.”.

<sup>19</sup> The full text can be found in Navarro Sánchez (2010, pp 379–380).

- *Hilas de Turruquena* ( $20 \text{ l s}^{-1}$  diverted each morning to the *Molino del Reloj* watermill at 4 a.m. and released into the reservoir at 6 a.m.)
- *Hila del Concejo*, also  $20 \text{ l s}^{-1}$  to be used from 3 p.m. until 3 a.m. and diverted to the *Molino de la Cabeza* watermill (it has a 30-day rotation and was later renamed *Hila de la Unión*).
- *Balsa Alara* reservoir, with an irrigation rotation of 282 days.
- The previously mentioned *Hila de la Unión*, which includes three *arobas*, flows into the *Balsa Alara* reservoir from 6 p.m. to 6 a.m. and has a 20-day rotation.
- *Río de Argan*, which consists of four *hilas* ( $80 \text{ l s}^{-1}$ ), has a 26-day rotation and is diverted from 1 p.m. until sunset from 22 September to 21 March and from 2 p.m. the rest of the year.

In the spirit of nineteenth century bourgeois and liberal dignitary policies, Article 12 of the statute corresponding to the revised law from 1879 restricts the pool of nominees for the office of chairperson to individuals who possess at least 50 *arobas* ( $14,400 \text{ m}^3$ ) of share rights. Until the outbreak of the Spanish Civil War, the bourgeoisie, who served as mayors and councilmen, also led the irrigation community: one of the irrigation community's board members was always a councilman. On 6 September 1936, under the leadership of the local People's Front, the aforementioned Article 12 was amended to the effect that any owner could be elected chairperson regardless of volume limitations and that each owner had one vote instead of the votes being proportional to the amount of water an owner possessed (Art. 33). These amendments were revoked immediately after the victory of Franco's troops. Since the water law of 1985 was passed, ownership rights have been viewed from a legal perspective solely as rights for beneficial interests. Moreover, the *Confederación Hidrográfica del Segura* (CHS) offered to endorse the irrigation community's usufruct rights for 75 years with the option of an additional 75-year extension.<sup>20</sup>

## Conservation and heritage value in the twenty-first century

The use and administration of water and the maintenance of the infrastructure required to collect, store and distribute water in Spain have their roots in the Muslim period, if not earlier. In some regions in Spain, this technical knowledge and water jurisdiction—in modified forms—have withstood different political influences over centuries. In these regions, the daily handling of water resources, the maintenance of the infrastructure and water conflicts have sensitised the population to water as a resource. Examples of bad practice such as the system for water management in Guadalhorce Valley document how imprudent reforms can destroy the traditional water management structures and with them, the knowledge, techniques and jurisdiction that successfully functioned for centuries. This stands in contrast to a persistent irrigational history in which, due to the population's daily exposure to the issue, the administration of the irrigation community fosters a sense of the value of water and retains the cultural heritage to manage it.

Whereas the *Tribunal de Aguas* of Valencia and the *Consejo de Hombres Buenos de la Huerta de Murcia* have become widely known since their inclusion on the UNESCO World Heritage List on 30 September 2009, throughout Spain there are smaller common law institutions similar to the water tribunals of Granada, Guadix and Vélez Blanco (Giner

<sup>20</sup> Conversation between Dietmar Roth, the deputy mayor of the municipality of Vélez Blanco, with the participation of the chairman of the irrigation community and the relevant department head in Murcia in June 2009.

Boira 1995; Gómez de Maya 2008; González Blanco et al. 2008; Melgares Guerrero 2008). On 3 October 2003, the Andalusian Ministry of Culture added a total of 63 monuments to the general catalogue of Andalusian cultural heritage. This includes the water culture in the Los Vélez region, thus according it the highest level of protection.<sup>21</sup> Following a ruling by the municipal council of Vélez Blanco on 17 April 2008, the regional government of Andalusia filed an application to protect the *Alporchón* as an intangible cultural asset and include it on the UNESCO World Heritage List.

In 2001, Dietmar Roth, the deputy mayor of Vélez Blanco, founded an initiative with the support of seven irrigation communities, in cooperation with Prof. Brigitta Schütt and the museum guide Encarnación Navarro López. The current headquarters of the *Alporchón* of Vélez Blanco were in danger of collapsing, but with the financial support of the EU Regional Aid Program, the municipality of Vélez Blanco and the Horstmann Foundation, they were completely refurbished and converted into an information centre on water culture. It is a living museum: each morning at 9 a.m. the *fiel de aguas* posts information on the irrigation rotation, and in the summer, water auctions are held there every fortnight.

**Acknowledgments** We would like to express our gratitude to the local authorities of Vélez Blanco and the Comunidad de Regantes de las Aguas of Vélez Blanco. The study is part of the Cluster of Excellence Exc264 TOPOI “The Formation and Transformation of Space and Knowledge in Ancient Civilisations”.

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<sup>21</sup> A detailed description of these 63 structures may be found in: Centro Nacional de Información Geográfica (2005, pp 147–248). On the *qanats* in los Vélez, see: Hermosilla Pla (2006, p 202); Roth and Schütt (2000) and idem. (2001).

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