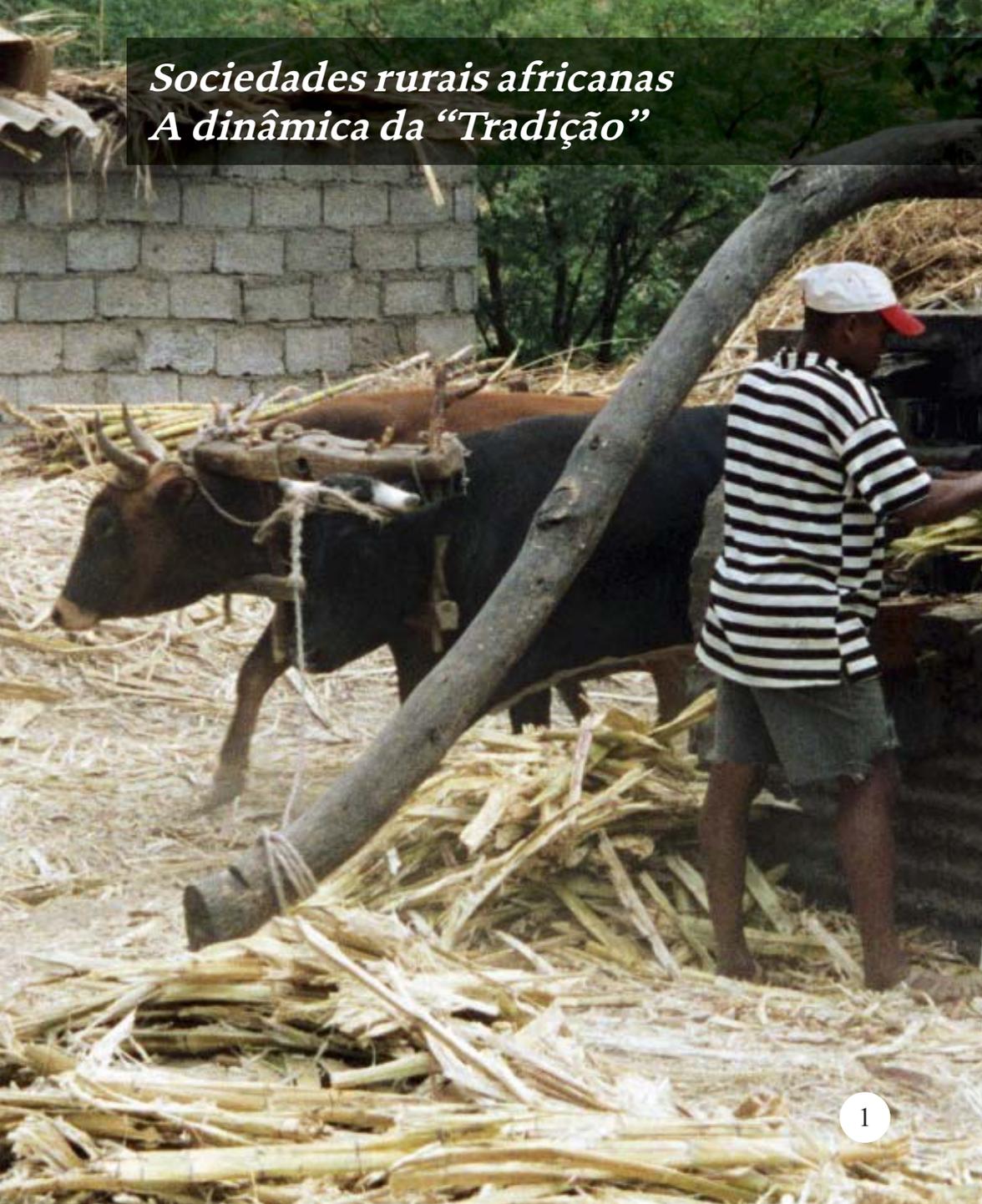


Sociedades rurais africanas
A dinâmica da “Tradição”







*Sociedades rurais nas ilhas
Canárias e Cabo Verde*



Farming structures, water and institutions in the Canary Islands

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I. Introduction

To a great extent, water has played a crucial role in the agricultural history of the Atlantic Macronesia (especially in the Canary and Cape Verde islands). In recent times it has become a limiting factor in their development, incurring social and economic costs. Water is a scarce natural resource in these Atlantic island territories. For this reason perhaps, throughout their history, institutions and specific cultural groupings have developed for water use and management. Each of these island chains have come up with their own institutional framework, with guidelines and cultural heritage that regulate the exploitation of this resource. This has led to legal rules which date back to the colonial era, especially in the Canary Islands—which have specific water laws- dating back to the final third of the 19th century. Furthermore, water ownership has caused social tension among the different social agents who control its use and management.

The historical importance of water is that, given the conditioned social structure of the Canary Islands, it has become a stimulus to its economy and forms of ownership. A wide range of disciplines, including archaeology, social anthropology, history, geography and agricultural, have studied diverse aspects of water use including its user associations, water-related conflicts, the role of public authorities, legal and political forms of control, organizational management, distribution, and water privatization, which may help explain a society's historical reality over time.

In this paper we consider the structure of water ownership in the Canary Islands and the relationship to the land. We also analyze the institutions that historically have been created and have directed water use activities. Finally, we describe the conflicts generated by possession and use. Given the limited information available, we attempt to provide a framework for comparative analysis with other Macaronesian territories.

Our hypothesis is that private water management prevailed in the Canary Islands, conducted through institutions (through so-called *heredamientos* or hereditary water rights agreements) adapted to the cultures of those who settled in the islands after the

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conquest. Such institutions tended to foster private management. Although similar to other Atlantic island chains such as Madeira and Cape Verde, the different islands varied according to their geo-morphological structure and composition. Thus water resources were different in each, leading to a plural situation based on their island condition.

Our area of study is limited to the Atlantic islands. This area provides a structured field of relationships in which the people throughout the region established several secure, stable contacts that would lead to interdependent networks. This structure is modelled on those of the fifteenth and sixteenth centuries, as before that time the ocean was considered an isolated, closed space by people who lacked any notion of each other. The Atlantic is a unique, interrelated community, but this a recent historical phenomenon. Since the centuries cited above, people from across this region began to forge vital, enduring links, although the economic, social, political and technical relationships would be subjected to the dynamics of historical change. The evolutionary and institutional theory allows us to account for this process in the social formation of the Canary Islands, a process which gradually set the boundaries between private use and public control. The economy, however defined, is an institutionalized activity (Polanyi). The definition of property rights is crucial (D. North). This means that, typically, economic activities, understood as activities embedded in a social and cultural context, take place in a legal or institutional framework, i.e., under an evolving institutional framework which we may refer to as rules, laws, agreements or collective norms which establish acceptable standards of individual and group behaviour.

Moreover, the economic and social problems may be regarded as examples of disruption, conflict, weakness or obsolescence in the way economic institutions perform. In other words, certain institutions may become obsolete, which would require a change or institutional setting. But there may also be serious conflicts between the institutions' instrumental and ceremonial functions, so that ceremonial override the instrumental functions, without the latter disappearing entirely. Thus, conflict was prevalent in this area of activity as discussed in Section IV.

Our text analyzes the management model and features of this institution, which determines how the Atlantic Macaronesia islands manage water (II). We then consider the structure of water ownership and its link to agricultural structures, particularly the relationship to the land (III), and the institutions that historically have been set up, especially in the Canary Islands such as tenements and / or communities (IV), the resulting conflict is discussed in Section V, followed by brief conclusions (VI).

II. A Mediterranean/Macaronesian model for water management

2.1. Water is generally a scarce resource though this is not always the case

The Macaronesian islands of the Atlantic archipelagos (Azores, Madeira, the Canary and Cape Verde islands) are remarkably similar in geography, terrain and climate. However, the Canaries are closer to the African Continent, though less exposed to winds further inland as the Cape Verde islands. The Canary Islands are scattered over 450 miles, while

exposed to subtropical the depressions, most of the rainfall rate affecting the islands are polar processes, the rainfall is scarce and different depending on the islands.

The ravines which trace the islands' different river basins from the sources allowed residents to make use of surface water from fountains, springs, winter rains, simply harnessed by canals, mines (galleries), artificial deposits, stored in tanks, caves, even the so-called invisible rain from trees.¹ All these strategies enabled farming to expand and thus help establish population in the European feudal system of allotments of land and water, as developed in mainland Spain between the twelfth and fifteenth centuries.

We should also bear in mind that the geographical and geological structure of the islands affected water availability as its volcanic origin strongly influences the availability of aquifers. To address water management is necessary to differentiate the islands that have continuous water courses (the Western Isles and Gran Canaria) from those such as Lanzarote and Fuerteventura which do not (Gonzalez Morales, 2007), and also the island of El Hierro, which despite having relatively abundant rainfall, its volcanic constitution makes it difficult to utilize this source. There are also marked contrasts on some islands between wetlands (in the Canaries, those exposed to the trade or lee winds) and dry or upwind areas. This is a crucial issue in terms of water use and the type of farming carried out. This geographical and climatological division basically coincides with the historical and administrative one as, from the time of the Spanish conquest, the Canary Islands were divided into "Crown islands" (Gran Canaria, Tenerife, La Palma) under the direct management of the Crown, and "islands of dominion" (Lanzarote, El Hierro, La Gomera and La Palma) given in concession by the Crown to the lords who administered them as feudal models.

2.2 Institutions and management model

The history of the islands' progressive occupation, basically explains land and water distribution. The origins and development of institutions that manage this precious resource have a common heritage in the islands: the process of conquest by the Iberian kingdoms, although we must differentiate between islands which were Crown-controlled and those islands controlled by lords in the case of the Canaries. Where resource was abundant, the management is carried out primarily through the estates or water inheritances, bodies set up by farming communities with the owner rights to irrigation, which aimed to manage water distribution and thus avoid improper use.

The origin of the Canary *Heredamientos* corresponds to the medieval systems of mainland Spain (Glick, 1988). There are certain parallels with peninsular practices, as in the case of Alicante regarding the *dula*² or *secuest*³ practice. However there seems

¹ Although little is known of aboriginal water infrastructure in the Canaries, ethnohistorical and archaeological evidence attests to a certain degree of technology, in the case of ditches, basins, cave-tanks or tanks (Suarez Moreno (2003); historically water was obtained by condensation in forests and the Canary native people on the island of El Hierro obtained water from the invisible Garoé tree rain, a tree whose sacred history has brought about the horizontal rain; meanwhile, in the Cape Verdean island of Brava, they now get water using alternative means such as the so-called "*draps tendus*." For information on Brava, see M. Lesourd, 1995: 90; El Hierro, see García Sánchez, 2007).

² The term *dula*, comes from the Arabic word "daula", which means irrigation rotation or turning and refers to a measurement of water. Thus, the so-called *gruesa* or total water mass is divided into proportions which are assigned a certain value which is expressed in units of time. In the *Heredamientos de Gran Canaria*, the *dula* is set by the number of days, normally 14, 15, 30 and 31 days, according to crop demands. Thus every water users know the days and number of hours they have of irrigation water.

³ This practice is carried out in many *Heredamientos* where a given quantity of water is divided for auction among the heirs or *aduladores*, and the money raised to cover overheads of canal maintenance and payment of employees engaged in the division of waters. The mechanism was by auction to the highest bidder among the heirs themselves, setting the starting price, by *cuartas* or

to be no link to the Valencian irrigation system in the Canaries from the late fifteenth or sixteenth century. From this point it is the largely run along an Andalusian system or at least in the techniques and practices applied in the Canaries was introduced by the Portuguese, the same people who brought sugar cane from Madeira (González Rodríguez, 1991).

The distribution of water by irrigation canals, by rigorous shifts and so-called *dulas* over time brought about an accurate system of flow measurements based on time (day, hour and minute), although in different units of measure, depending on islands and counties. To control this, the institutional figure of the *water mayors* developed, very similar to the *water judges* in Madeira guarding water and first expressed lawsuits that arose in the so-called *levada* (irrigation canals).

From the primitive system of measuring water flows, based on *fanegada* (unit of measure), hoe, quarter section, furrow ... the so-called *azada* (or hoeful based on 9-10 litres per second) endured in Gran Canaria as a distribution measurement and those whose first water models, looked for solutions in curious structures such as the *water corners* and *weighers*, another example of the loosely arranged generation technology, in this case simple but clever applications based on the principles of hydrodynamics (González Rodríguez, 1991: pp. 467-497).

Indeed, in the first divisions of Gran Canaria, the water that sprang from the peaks was linked to the lowlands, from which emerged a special regime of property managed by a unique organization: the *heredamientos* controlled by the new owners of the means of production. The flow, which once supplied the population needs, was channelled into the sugar cane plantations for their sugar refineries, nearby settlements and water mills, as well as to the crops of grain, vegetables and fruit trees.

From the late fifteenth and mid-sixteenth century, the new economy of those islands growing sugar cane needed professionals (masons, carpenters and “water-drawing technicians”) to carry out the first waterworks. For the most part, they were brought from Madeira. They constructed ditches, canals, tanks, ponds, domestic wells, mines and tunnels for water transfer. They also carried out several refineries, both to raise the water (water-wheels and compressor scrolls), and to harness its energy with waterfalls, windmills and water mills.

The first hydraulic technology elements, water ownership and management, were adapted to the environment and provided informal generation of technology that, once established, remained practically unchanged until the final quarter of the nineteenth century. However, as the years passed, water systems and measurement techniques were improved.

The first local law regulated *Heredamientos* and adapted to flow privatization, since, over time, almost all water and rainwater sources assigned to the distributed land was disengaged. Thus, property was handed down from generation to generation (via inheritance, sales, etc.). As it was detached from the land, water began to cause many conflicts across the Island.

water stream. This practice has been found mainly in the Spanish areas of Alicante, Elche, Crevillente, Monforte, Granada, Lorca and Gran Canaria.

Table I. Property structure in some tenancies of Tenerife and Gran Canaria

Tenancy Agreement	Island	Distribution date	Participants	Property concentration	
				% of the <i>Dula</i> % participants	
La Orotava	Tenerife	1543	26	79.84	15.39
Arucas-Firgas	G. Canaria	1647	31	44.66	3.23
Arucas-Firgas	G. Canaria	1710	70	57.03	2.86
Las Mina	G. Canaria	1749	18	34.16	11.11
Barranco Seco	G. Canaria	1749	35	39.36	11.43
La Orotava	Tenerife	1869	46	46.19	13.04
La Mina	G. Canaria	1880	33	43.06	12.12
Barranco Seco	G. Canaria	1880	38	34.45	10.53

Source: Nuez Yáñez and Carnero Lorenzo (2002: 384) published in Macías Hernández (2000: 189, 195, 216-217).

In the Canary Islands, water ownership was linked to land from the time of the European occupation, so that farm structure and water ownership are closely linked. This has led to ownership concentration of both resources in so-called water tenancies, in a process originating in the Conquest in the sixteenth century the process was similar to other islands such as Cape Verde, where the origin of the large owner is in the regimes of *morgado* and the *capela*??, from the sixteenth to the nineteenth century. However, in both social formations smallholders also had access to land and water. In the nineteenth century, many properties change hands, being the origin of property now in effect Canary basically the process of the Confiscation. In Cape Verde, the effect of drought or labour shortage after the abolition of slavery along with emigration, forced large landowners to go into debt or sell off their properties.

In the Canaries, the granting of plots of land and water on the Crown islands involved remuneration from the Crown to those who participated and financed the Conquest, as well as settlers, lured by promises of new land and tax incentives, who chose to settle under certain conditions, thus allowing the consolidation of the new space around the cultivation of sugar cane.⁴

On the islands of Gran Canaria, La Palma and Tenerife, plot distribution was granted by the Catholic Kings, who bestowed these privileges on their governors. On the lordship islands, the lords allotted available resources to the colonists who settled there. So both powers granted water rights to their subjects, under late medieval Castilian law and in accordance with the socioeconomic status of the conqueror and settler, assigning a specific volume of irrigation water to a given area of land, as expressed in various allocation details.

From the outset this involved secondment from water to land and the granting the recipient the right to water flow use in perpetuity. This process of distributing water to a minor-

⁴ Among the imposed conditions we would highlight the obligation to buy out neighbouring property. This had to be held for at least five years on the island in which the land was granted, and the goods received and crops grown could not be not relinquished on the distributed land during the stipulated period.

ity groups favoured by the conquerors made major funders of the Conquest and receiving lowland coastal areas of the islands of Gran Canaria, Tenerife, La Palma and La Gomera. The areas which enjoyed higher temperatures and flat terrain for high flow irrigation were used for growing sugar cane plant which is particularly well suited to these climate conditions. The economic viability of this industry after processing allowed the Canary Islands to join the emerging commercial capitalism. Operating this industry required significant quantities of water not just for watering the plantation crops and sugar refining, but to produce the hydraulic power required to move the cane crushing machinery and facilitate consumption. Thus, the bringing of water flowing through streams or springs began, around the major watersheds and ravines, to irrigate the cane fields. As in other Macaronesian archipelagos, cane cultivation was instrumental in water distribution allotment.

As mentioned above, in the nineteenth century the privatization and concentration of water ownership was increased by the process of so-called Disentailment. With the Royal decrees of 6 August 1811 and on 19 July 1813, accelerating the conversion for private water ownership and the separation of land ownership, so that by 1859 of the total of 1446 springs and water sources in that year to the islands of Gran Canaria, Tenerife, La Palma and La Gomera, 67.2% was privately owned, with the privatization process stronger in Gran Canaria, where the ratio of irrigation neighbours / number of private sources was 8.5, with values of 15.8 in Tenerife and 73.9 in La Gomera.⁵

Data on this process of land and water union are fragmentary, but by studying the distribution of inheritances and property in some communities we can clarify the situation. In the town of Gáldar (Gran Canaria) in 1860 from a total of 744 counted in the mill owners for that year, those without water account for 32.5 percent, but also 81.4 percent of the owners only have a flow from *dulas* (every thirty days) to water on average 1/2 acres of land, i.e. less than 3,000 square meters (Martin Ruiz, 1982). Although it is an aspect not sufficiently studied, some indicate that large landowners, such as the Count de la Vega Grande in Gran Canaria, possessed large estates as well as most of the water flow of the estates⁶.

To summarize this section, it should be noted that despite the great interest in this topic, as several authors have noted (Perez Marrero, 1991; Macías Hernández, 2000), there are obstacles in our way, first by the dispersion of information and, secondly, by the large reserves generally imposed by the administrators of such institutions.

IV. Origin and development of the institutions for water management in the Canary Islands.

4.1. From the water tenancy agreements to the water communities

After the Conquest of the islands, the system of distribution, the *heredamientos* or tenancy agreements, the Irrigator Communities or Water Communities were organized by flow distribution of springs, wells or galleries. They may take different successive forms over time, administering the exploitation of aquifers, where the public domain and is

⁵ These data are taken from Macías Hernández and Ojeda Cabrera (1989: 23), who cite P. Olive (1885): *Diccionario estadístico-administrativo de las Islas Canarias*, Barcelona.

⁶ In this case, the south of Gran Canaria, see Martín Santiago and Bello Jiménez (2006).

intertwined conflicts with small-scale, private interests (González Rodríguez, 1991: 467). These institutions are those used to govern and manage the use of irrigation water. Documents from the early sixteenth century cite the appearance of the first irrigation communities or tenancies as land is distributed for irrigation from the coast inland. They include those located in Gran Canaria, where the inheritance of Aguas de la Vega Mayor de Telde (c.1480) and Valle de los Nueve (Valley of the Nine) (1501), the estates of Vegueta, Triana and Fuente de Morales (1501) estates of Arucas and Firgas (1505), the Heritage of Tenoya (1506), or Palmital de Guía (c.1491), in Tenerife, the Guimar property (1500) and the one inherited from the Orotava Valley (1501); or on the island of La Palma, the estates of Argual and Tzacorte (1502).

The history of the estates founded after the Conquest is highlighted by two main factors: first, the adequacy of water management models to the laws that were applied to the whole Spanish State, and, secondly, the gradual effort mostly those who benefitted from the use of bulk flow (total mass of water) to achieve private ownership of water. These institutions originally took different forms in the Canaries, depending on the collective or individual nature of the beneficiary of water distributed (De la Rosa Olivera, 1969). Moreover, within these bodies there would be transfers, sales and subdivisions of hereditary water rights of the participants themselves on the estates, many of whom belonged to the oligarchy that held civil, military and economic power, allowing control and privatization of the resource, through usurpation, and consequently the separation of water from the land. Thus began a water market in which these institutions have a platform for the oligopolists (Macías Hernández, 2000: 183-189).

With reformer Juan Ortiz de Zarate's arrival in the Canaries in 1505 the estates get naturalized, regulated favoured water practices, confirmed by Royal Decree of 3 January 1508, which specified that tenements are governed by boards and shareholder agreements, under Royal Court direction. Once general rules of engagement were established, all the heirs could water at will and the right of the other partners was attended. Thus, the Royal Decree of 22 December 1529, appointed Visitor of the Audience of Canarias Francisco Ruiz de Melgarejo, drafting Council of Gran Canaria Ordinances in December 1531, including a chapter on water mayors and their functions.

This body of law further reaffirmed these estates' private character, which did not prevent a struggle ensuing between these estates and the rain-fed land owners located in mid mountain and summit areas, when pressure on water use increased as a result of the reduced water level and extent of cultivation in these areas. The question to be clarified was whether water ownership that flowed from those lands granted the right to use water and not ownership, or is granted full control and ownership of the tenements waters following the Conquest. In the nineteenth century, with the royal decrees of 1811 and 1813 cited above were cleared of jurisdictional domain. Although they rescinded the principle of communal ownership that prevailed over water, these measures affected the internal organization of the tenancies subject to these legal instructions regulating their duties and rights. As a result, they lost Court protection and the power they gave to the mayors, to become mere passing interest associations without organization. Years later, with the Water Act of 1866 and its subsequent reform in 1879 the majority of the estates were adjusted to the new rules, becoming Irrigation Communities (Association of people who collectively take advantage of public waters for irrigation adapting their internal organs to the new situation).

So this new stage is significant in that it ushers in the Water Communities: unlike the *Heraamientos*, created after the water property itself as seekers of water bodies and formally organized as a joint ownership or community property, communities created to seek out groundwater through wells and galleries, they were considered a society, to be appointed as stock holdings. However, once the water was found, there were more or less substantial differences in interests, if not identity “(Marcos Guimerá, 1957).

The emergence of these modern communities threatened traditional rights, as it clashed with their own interests. Only the organization of irrigation communities, erected as administrative bodies for catchment of public waters, were contrary to the exclusivity of the European Water model. Only on the island of La Gomera did Irrigation Communities prevail in the form of public agencies acting as administrative delegates (Reyes Aguilar, 1989).

Thus, while the estates were created to capture surface water, there comes a time when the heirs provide water, as property rights holders. In a Community of Water, the participant is a capital investor, who takes a risk getting involved with a random company, which can make a profit or loss. A high percentage are not farmers, but the high flow attracts their participation as they trade with growers, establishing a commercial relationship. These communities, their searching and channelling works had the value of mitigating flow decline among the tenants, but in most cases caused its decline (Guerra Marrero, 2000). The number of permits up to 1970 totalled 5,835 in Gran Canaria, but not all of these licenses are for different catchments, as there are 2358 points of groundwater extraction (Quirantes Gonzalez, 1981; Guerra Marrero, 200, 322).

In these organisms capital has been concentrated. In Tenerife, for example, of 39 water communities (26 per cent of those established in the Canaries) operating in the twentieth century, less than 15 percent of the participants controlled a third of the capital in most communities. This fostered the notion of concentrating the water business in the hands of a few, as, in some cases, 44.5% and 39% of capital. This trend has exacerbated since the 1960s as one-fifth of the shareholders control two-thirds of the entities' capital (Nuez Yanez and Carnero Lorenzo, 2002: 386-388).

Moreover, the laws that helped create water communities also led to the establishment of numerous water companies: between 1896 and 1935, 126 were founded, of which 73 acted as communities, 37 as joint stock companies and the rest as regular collective unions (Nuez Yanez and Carnero Lorenzo, 2001).

While several instructions, such as the November 27, 1924 Royal Ordinance attempted to protect the rights of the estates, with the May 23, 1938 Public Works decree a crucial stage in the history of the inheritances began: This culminated almost certainly with its demise, according to the Special Law for the Canaries on 24 December 1956, which made it law.

Currently, state intervention in water matters under the current Water Law of 2 August 1985, submits the Irrigation Communities to the so-called User Communities, a general, compulsory institution of public water users. In the Canaries, the Water Act of 26 July 1990 was adopted, which, while observing state law, continues to recognize the legal status of tenancy agreements and Water Communities, adjusting them to the Island Water Plans.

4.2. The water market in the Canaries

In the Canary Islands a water market ran and still operates, because “water has owners, and consumers have to go to acquire them if they want to meet their needs, it then

establishes a market in which sales go to the highest bidder, giving priority to the need to maximize the profits of the owners of the resource” (Nuez Yanez and Carnero Lorenzo, 2003: 374). However, this statement is based on generalities, as private water property exists only on islands with sufficient resources, an issue that can not be applied to those which suffer with supply shortages such as Lanzarote and Fuerteventura, but and this islands there were irrigation communities to obtain from underground (González Morales, 2000).

In the case of the *Heradamientos*, which bring together owners of water (aguatenientes) and the de facto separation of ownership of land and water resources, a water market was launched in which these institutions played a dominant oligopolistic role as suppliers, transcending the purely economic framework as well as most became the mainstay of the Canaries oligarchy, being the main landowners of the partitions.

The oligopoly situation is exacerbated when many small shareholders, who do not consume all of their water, put the management in the hands of brokers responsible for selling, and these directly control the market and distribution networks. As we have already mentioned, this control began at the time of the conquest and colonization of the archipelago.

The water market is structured in two ways. First, through a so-called the “property bond market” which involves buying shares, owning galleries or wells, giving entitlement to flow percentage, which is speculative, as belonging to a stock market (the water market of Plaza Weyler in Santa Cruz de Tenerife is an example today). Secondly there is the “market water as economic commodity,” i.e. acquiring the water that entitles a share per year (in the north of Tenerife) or for periods exceeding one year.

The water market treats Estates or Water Communities as vendors who sell what their tenants or participants do not use. Buyers include town halls as well as local industries, tourism and new farmers, who do not have the water rights which established property owners do. There are also go between, who buy, distribute and sell water. Generally, these intermediaries, which can be communities, are owners or have the right of way to pipes and canals that channel the market in its true sense. This transport network functions like an electrical grid, water poured into it from different owners and in different qualities, and the buyer withdraws its place of consumption, enabling a buyer who does not have network access to obtain the water in the place of production, may withdraw from other different networks and from different owners.

The water source is on the market that has no distinction made up his administrative title, coexisting concessions from public waters, private and resulting administrative authorizations. Even institutional origins, such as the island administration or *Cabildo*. In this case the Insular Council of Waters, controls the water obtained as a concession, selling the surface water from its five reservoirs.

Four crucial facts have encourages water markets (Guerra Marrero, 2000: 322): 1) Large numbers of deposits which ensure decentralized and fragmented supply; 2) Unstable groundwater production, which tends to run out and therefore requires exchange of water flow between the beneficiaries of each collection point, 3) The existence of transfers of water systems, large networks that interconnect with each other with these producers and consumers, 4) Water Communities, which have a high number of units have achieved the capitalization of the sector. These four facts are essential to maintaining the market. The many catchments distributed all over the island guarantee the supply.

V. Water ownership and social conflict

Although water-related social conflict has existed in the Canary Islands almost since it was incorporated into the kingdom of Castile, the situation worsened from the eighteenth century, with many clashes over water use and ownership (see Table). In the eighteenth and early nineteenth centuries riots erupted, especially in Gran Canaria. This conflict is not unique to the Canary Islands, as there were also incidents in Cape Verde, for example, coinciding with the end of the *Morgado* regime (nineteenth century) which included various conflicts (Lesourd, 1985: 81 and 250).

Moreover, these conflicts resulted in numerous lawsuits brought before the Canary Court by inland landowners. These legal disputes did not substantially alter the customary status of the *heradamientos*, but there were instances in which the owners were rewarded with new tenancies.

Such conflicts may be explained from two perspectives which are not mutually exclusive and follow chronological order. First this historical period saw the breakdown of social and economic system of the ancient regime in the mid eighteenth and early nineteenth centuries. In this time period there were ten riots over water or 17.2% of registered social conflicts (Suarez Grimón, 1987: 463-465). We would add to this the changes in agriculture, drought and the continuing intention of the oligarchy to become the sole owner of the water.

The second perspective that helps us understand the causes of conflicts over water refers to their relationship to different water resources uses. These different uses generated various forms of quarrel, typified by the usurpation of these resources. The conflict began with administrative litigation, which led to the outbreak of riots and uprisings at the time of sentencing, usually with broken irrigation channels and *albercones* (water ditches).

Furthermore, the main cause of conflict in the eighteenth century was encroachment of water from stealing its flow, in the simplest of cases, to the most complex, in the twentieth century, through holes that affected both galleries and water sources.

Other data that help support the above are those relating to the times in which most of the conflicts are recorded (in late spring and early summer) and, secondly, which relate to the participants in riots and uprisings. These were generally neighbouring localities who opposed water authorities or landowners which wished to expand their powers through administrative litigation. Interestingly, women participated actively in water-related conflicts, even disguising themselves as men to participate in them. The use of rustic weapons (sticks, hoes, etc..) would seem to indicate that fight was not intense, but the duration of some struggles, lasting decades, as in the case of Teror, and fatalities and arrests of those involved (as in Tejada and Artenara), indicates an intense battle for water resources, though local and rural.

So conflicts develop in the Canary Islands when the intention and action taken break with a customary right over the waters of mid mountain regions and at the summit, in favour of the interests of social groups in power that present themselves as owners of the land where the springs are found.

Following the laws of 1866 and 1879, privatization gave way to initial confiscation and there were popular riots over water and ensuing lawsuits, though with exceptions.

Some of the most recurrent conflicts were those involving local councils as water is generally recognized as being one of our most precious resources, and an essential part of their funding. These institutions act as intermediaries between disputing parties or parties directly

involved. Therefore, in the early twentieth century, the conflict of “*El Chorro*” in Telde culminated in the municipal acquisition of the water that was allocated for community use.

The longest dispute involved “*Fuente Agría*” in Teror. In 1911 the town council had protected this publicly owned source against individuals seeking to exploit it privately. Between 1968 and 1975 it defended the spring against the shafts and tunnels that drain groundwater sources, with partial success. Another cause of dispute between the water sources of neighbouring towns of Arucas and Fingas municipalities in 1938, on account of water rates, an essential point for municipal financing and which had already been established on other islands (Perez Marrero, 1990: 441-447). In the same area in 1954 a lawsuit was taken between the estates of Arucas and Fingas and the Arucas Town Hall, due to the water supply (Guimerá Peraza, 1957: 74)

The conflict between water heirs and other private investors have become more common over time. Groundwater withdrawals were a major challenge against the general complaint made by tenants in 1873 (Hernandez Macias, 1989: 250). Well into the twentieth century a dispute of long duration exploded in the town of Agüimes, lasting from 1969 to 1982 when the heritability of the *Heredad de Los Corralillos* property came into conflict with the private owners of well draining water from the gallery of the heirs. However, the delay in prosecution caused damage that was irreparable. In nearby Temisas there have been over twenty of these *Heredades* consisting mostly of small farmers, brought litigation against Julian Bony in 1982 for the gallery he owns, which drains the waters of the galleries, which had already opened the first. At Carrizal (Ingenio township), the estates of *La Majorera* and *Carrizalera* quarrelled with individuals as a result of changing sources of ravine overflow waters, this case also involved another *heredamiento*, the inheritance rights of Agüimes against the Carrizal (Pérez Marrero, 1990: 441-447)

The most interesting cases which best illustrate the privatization process are those that affected several neighbourhood groups against private entities: individuals, traditional heirs and water communities, which were initially created for extracting groundwater resources. These groups would seek to appropriate those long-time water sources, but without institutional regulation.

In 1909 and 1912 water sources at Tenoya were defended by neighbours, when an individual attempted to open a private gallery. In 1927 the residents of La Aldea de San Nicolás finally overcome a long dispute, over three centuries, against landowners, achieving public ownership of water and irrigation organizations as irrigation communities, or as managers of this public resource. In 1929, however, the Arsenal's neighbours were unable to defend their rights to traditional water use in their area, when the *Sociedad de Quiebramonte* drilled a gallery and channelled the water to irrigate farms in Arucas. This action soon dried up the waters which these neighbours had once enjoyed. Finally, in 1988 farmers and herders in Guayadeque defended their right to traditional use of public waters of this ravine at several inherited estates or *heredamientos* in the lowlands of the island. (Perez Marrero, 1990: 441-447)

The model we have described is valid all the islands, although each has its particular dynamics. Tenerife is known for its long-term defence made by the residents of Guía de Isora against privatization attempts. For example, over the use of the spring of Siete Fuentes, Acentejo residents fought private interference. Tacoronte landowners over harvesting with rainwater runoff water. In Tegueste, neighbours and town officials were unsuccessful in defending public waters in 1852.

As we see, municipalities also play an important role in Tenerife, fighting each other, as in the case of “Fuente de San Pedro” in the Northwest of the island, which would face Icod de los Vinos, La Guancha and San Juan de la Rambla between 1847 and 1852, with victory going to the first (Macías Hernández, 1989: 235) or, as in the case of Isora, defending public waters. The most important dispute between an old legacy (La Orotava) and private newcomers, in this case, known as “The Company” took place between 1844 and 1873. The struggle for surface and groundwater led to the merger of both entities which carried out expansion work on the acquisition of public land and water uptake (Macías Hernandez and Ojeda Cabrera, 1989).

Table II. Summary of water-related conflicts in the Canary Islands

TIME PERIODS	ISLANDS	CAUSES	PARTIES INVOLVED
18th CENTURY	Gran Canaria	Water usurpation (3) Water Mayor Excesses (5) Channelling of waters (2) Breaking water channels and irrigation ditches (<i>albercones</i>)(2)	Neighbours and <i>Heredamientos</i> Neighbours and <i>Heredamientos</i> Neighbours and <i>Heredamientos</i> Neighbours, <i>Heredamientos</i> and Public Authorities
19th CENTURY	Gran Canaria Tenerife La Palma La Gomera	Water usurpation (2) Private interests against public property (6) Channelling of waters (4) Breaking water channels and ditches (<i>albercones</i>) (1) Water titles (1) Perforations of galleries and water sources (2)	<i>Heredamientos</i> and Private Entities Neighbours, Town Halls and Private Entities Neighbours and <i>Heredamientos</i> Neighbours and Town Hall Authorities Town Halls <i>Heredamientos</i> and other Private Entities
20th CENTURY	Gran Canaria	Water usurpation (3) Private interests against public property (5) Perforations of galleries and water sources (5) Urban water supply(2) Perforations of galleries and water sources	Neighbours, Town Halls and Private Entities Public Administration and private entities Neighbours and Private Entities Town Halls and <i>Heredamientos</i>

Note: The number of conflicts in parentheses.

Source: Suárez Viera and Rodríguez Artiles (2009)

VI. Conclusions

When analyzing water management in the Canary Islands, one notes the establishment of an institutional framework shaped over centuries, inherited from the cultures (mainly Iberian) of the island conquerors, similar with that in other Macaronesian islands, but adapted to the peculiarities of the Canary Archipelago. These institutions are peculiar to a capitalist social formation that favours the dominant social groups (the so-called *aguatenientes*) which retain a major part ownership of water, in most cases attached to the land. Thus *aguatenientes* and land tenure form a bloc. However, this is coupled with a multitude of small owners who also own stock, but in small percentages compared with the former and without decision-making authority.

Water ownership has evolved from a situation linked to the land to gradually growing out of it and also becoming privatized. This gives rise to a capitalist institution itself, the water market.

However, the vague definition of property rights and the tendency to hoard some historical mementos, has led to a major conflict and litigation over the ownership of water. Local accounts report that property rights were either not well regulated or not observed as the ruling class tried to take advantage of their political and social power.

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