

Closas, A. 2018. Groundwater, the state, and the creation of irrigation communities in Llanos del Caudillo, Spain. *Water Alternatives* 11(1): 19-39



Groundwater, the State, and the Creation of Irrigation Communities in Llanos del Caudillo, Spain

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ABSTRACT: This article explores the creation of new groundwater-based irrigation communities as a result of the internal colonisation projects of Franco's government in the 1950s in La Mancha, Central Spain. The literature on Spain's hydraulic mission has mainly focused on the use and mobilisation of large surface water projects as part of a state-driven modernisation mission promoting irrigation and water management infrastructure without much contextualisation or focus on its operationalisation at the local level. This paper complements this body of work by examining the local socio-political development of government-led irrigation plans in the colonisation town of Llanos del Caudillo. Moreover, the study of Spain's hydro-politics and colonisation efforts usually focuses on surface water infrastructure while the public promotion of groundwater use has always been relegated to a second place, as it was mainly driven by private initiative. This paper substantiates the role of groundwater within Spain's hydraulic mission and production of state-sponsored irrigated landscapes.

KEYWORDS: Groundwater, hydraulic mission, irrigation, colonisation, Spain

INTRODUCTION

Set within the context of Spain's development of rural areas after the end of the Civil War (1939), this paper examines the close relationships woven by Franco's government between agriculture policy, irrigation, groundwater, and colonisation in La Mancha, Spain (i.e. through land reclamation with internal human settlement, known in Spanish as '*colonización*').

Two main ideas underpin this study. The first one arises from the fact that during Franco's dictatorship in Spain (1939-1975), the exercise of state hegemony over its subjects was developed with the help of agriculture and water. This thesis has been developed through the study of a large body of literature exploring the production of water-based political landscapes by the state to fulfil its hydraulic mission during the early and mid-20th century (e.g. Boelens and Post Uiterweer, 2013; López-Gunn, 2009; Swyngedouw 1999, 2007, 2014). The rise of this hydraulic paradigm was developed as a state-driven modernisation project promoting technocratic approaches and infrastructure to tame rivers and supply water for various uses (López-Gunn, 2009). As Molle et al. (2009) contend, the development of hydraulic bureaucracies and large-scale water infrastructure has been a defining feature of state building in the 20th century. During this historical period, states took "the role of (large-scale) developer of water resource" as part of a process of public legitimisation, investment and development (Molle et al., 2009: 332). The development of irrigation and colonisation in Spain under the hydraulic mission have also been examined, particularly the role of the Ministry of Agriculture and the National Institute of Colonisation (*Instituto Nacional de Colonización*, INC in Spanish) (Houston, 1950; Monclús and Oyón, 1988; Naylor, 1967; Ortega Cantero, 1979; Peperkamp, 1972).

This literature is complemented by other authors exploring the interconnections between state politics, land reclamation, internal colonisation, and water infrastructure. As Worster (1992) and Reisner (1993) have revealed, there is a connection between the development of settlements in the West of the USA and colonisation and water management infrastructure. As Gibbs (2009) also detailed, the colonial imperative of developing the nation meant the instauration of water management regimes in Australia. Other historical cases of agrarian landscape transformation linked to wider state plans include Mussolini's colonisation of the Pontine river marshes in 1930s Italy (Caprotti, 2007, 2008), the 'organic design of space' in Eastern Europe under Nazi Germany (Blackbourn, 2006), to the reclamation of Egypt's desert through agriculture and irrigation (Mitchell, 2002; Sims, 2015). These internal colonisation and land reclamation plans show that such projects responded to the will of governments to dominate and transform both society and nature through the creation of modern rural landscapes. Agrawal (2005) further reflected upon the impacts of both the environment and government on the creation of specific subjects with technologies of government regulating nature. For Alatout (2006, 2008), political territories in Israel and Palestine were constructed around perceptions of water scarcity and new forms of subjectivity (i.e. the modern citizen).

In the case of Spain however, fewer authors have attempted to explore in detail the historical impacts of national hydro-politics on farming communities and the concrete operationalisation of colonisation politics at the local level. Moreover, when studies examining the larger historical context of Spain's hydraulic mission attempt to refer to colonisation efforts, they usually glance over them as examples without much analysis or contextualisation (Sanchis Ibor et al., 2011; López-Gunn, 2009; López-Gunn et al., 2012). Partial exceptions are found in Naredo's (1978) work on the colonisation plan of Badajoz (Extremadura) which dwelled on what he labelled 'the coercive mechanisms of colonisation', focusing on how the disciplinary space created around the settlers and colonisation towns reproduced hierarchical and paternalistic relations between the bureaucratic structure of colonisation and the farmers. Equally, Peperkamp (1972) studied the particular area of La Mancha and the colonisation towns of Llanos del Caudillo and Cinco Casas and the development of agriculture. In Andalucía, Cruz Villalón et al. (1980) also studied the colonization plans in Viar and Guarc Pérez (2011) the INC plans in Bardenas, Aragón. However, more recent examinations of Franco's hydro-politics (Swyngedouw, 2014, 2015) and its scientifically engineered colonisation mission (Camprubi, 2014) continue to struggle to reconcile the political process of colonisation with its locality on the one hand and the effects on irrigation communities with the specificities of water resource management and use on the other.

The second idea underpinning this paper revolves around the use of groundwater in the establishment of a hydraulic state in Spain, substantiated here through the case of Llanos del Caudillo. Previous academic works have mainly focused on surface water to demonstrate the use and purpose of natural resources in statecraft processes (López-Gunn, 2009; Swyngedouw, 1999, 2007, 2015; Vargas and Paneque, 2015). Large surface water irrigation projects required construction and maintenance by the state, while allowing the state to drive the direction of agrarian growth. At the same time, groundwater had been developed through private initiative but was legally relegated to a second place by the state. This is because groundwater is usually considered a matter of private initiative and investment subject to the 'rule of capture' and kept separate from surface water management, an approach called 'hydroschizophrenia' by Llamas (1975). Meanwhile, it has already been shown how the 'silent revolution', initially thought to be orchestrated and directed by farmers (Fornés et al., 2005), was a more complex phenomenon interposing state politics, agriculture subsidies, and rural development programs (Closas, 2014). This paper complements these studies by examining the role of groundwater within the context of a hydraulic state and the socio-political and irrigation development of a colonisation town in La Mancha, Central Spain.

Thus, in this study colonisation politics and groundwater-based irrigation in La Mancha are approached through their variegated dimensions to illustrate the role they occupied in Spain's water politics. These were not only used as a development policy but were also inherent to a discourse of moral and ideological regeneration of its population and the forced creation of a new rural landscape and peasant subjects, citizens dependent on irrigation in newly built towns. Through state-led colonisation and irrigation plans, this paper illustrates firstly how the fabrication of irrigation subjects was played out and supported by new political structures and agrarian policies in Spain in the 1940s and 1950s. Secondly, this paper positions groundwater as part of the hydraulic mission and at the centre of these irrigation efforts in the groundwater-abundant region of La Mancha, substantiating the pivotal role of groundwater in the construction of the hydro-political waterscape of the area.

The area chosen for this study, including the town of Llanos del Caudillo, is located in the province of Ciudad Real in Central (Figure 1). Located within the Guadiana River Basin, the area loosely known as La Mancha overlies a 5,500 km² aquifer with a natural storage capacity of 12,000 Mm³ (Martinez-Santos et al., 2008). The aquifer system can be divided into a highly transmissive Miocene aquifer with mostly unconfined limestone and marl, a low-permeability Cretaceous limestone aquitard underneath, and a deep impervious Jurassic aquifer with limestone and dolomite (Martinez-Santos et al., 2008). Under natural conditions, groundwater's natural outlet is the Las Tablas de Daimiel wetland covering an area of around 20 km² and a flooded surface of 16.75 km² (ibid). Since the 1960s, the intensity and rapid expansion of irrigation relying solely on groundwater coupled with river and wetland drainage operations for irrigation and malaria prevention purposes, drained the aquifer and negatively impacted on the wetland, reducing its surface to one-seventh of its original surface (Bromley et al., 2001; Brufao and Llamas, 2002; López-Gunn et al., 2012; Martinez-Santos et al., 2008).

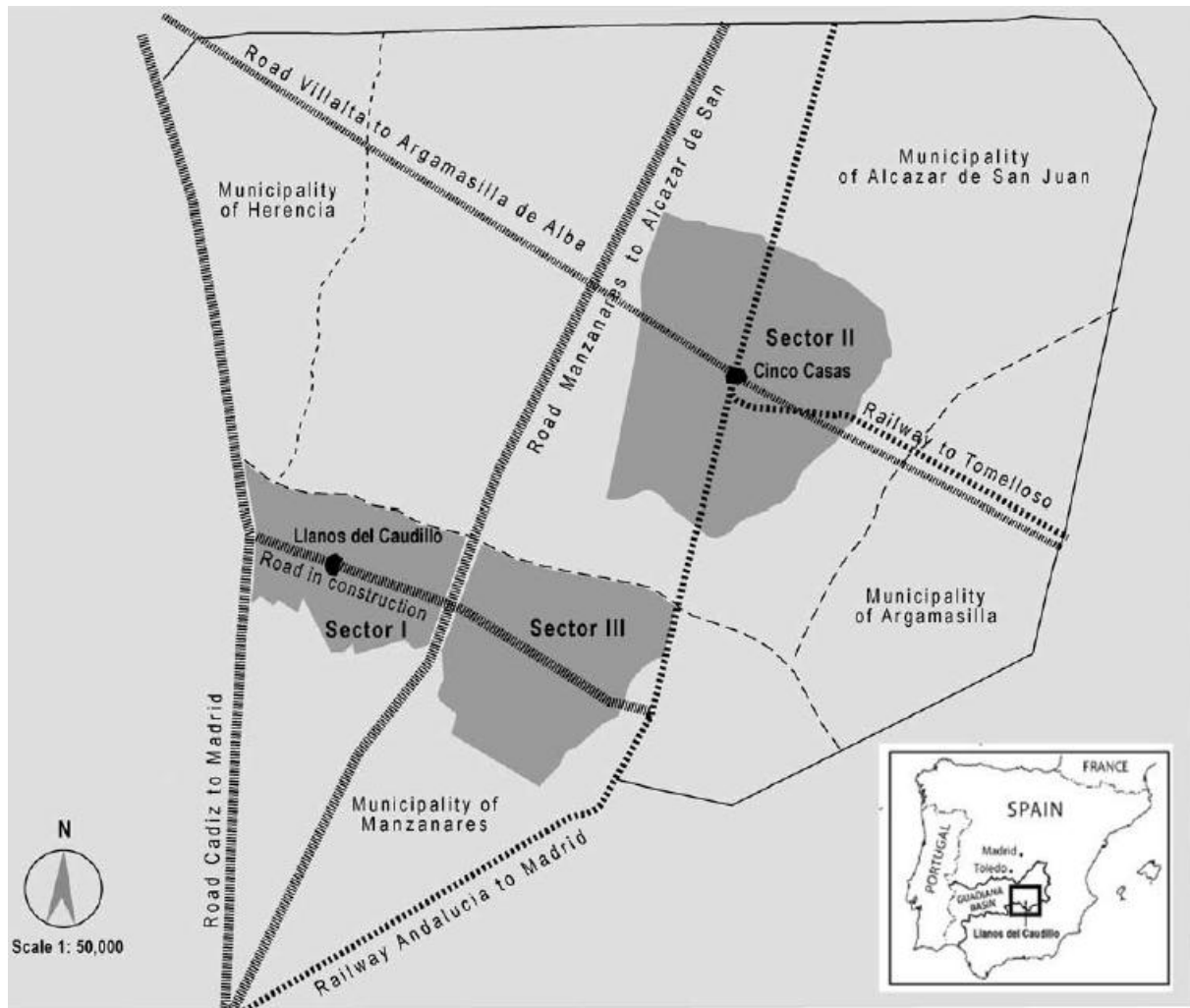
The structure of this paper is as follows. First, the paper introduces the historical antecedents of (internal) colonisation politics in Spain. Then, the paper focuses on the ideology and politics behind Franco's projects of irrigation and colonisation. The following two sections explore in detail the process of construction of Llanos del Caudillo and the creation of an irrigation community with the selection of settlers. Finally, the paper introduces the role of groundwater in the development of irrigation and colonisation in La Mancha and briefly assesses the impacts of Franco's colonisation efforts.

HISTORICAL ANTECEDENTS OF COLONISATION POLITICS IN SPAIN

Modern colonisation politics in Spain are rooted in 17th and 18th century agrarian politics. This period was driven by a concern to guarantee both agrarian population growth and wealth in the countryside (Monclús and Oyón, 1988). As a result, 26 new towns were built at the end of the 1760s in Andalucía, housing 10,240 new settlers, some of whom were Catholic settlers brought from Germany and the Netherlands (Carrión, 1972; Giménez López, 1993; Juárez Sánchez-Rubio and Canales Martínez, 1988; Robledo, 1996).

Following this initial venture, modern colonisation politics effectively began on the 29th of April 1860 when a Royal Decree opened up the possibility for the state to take part in irrigation plans (Ortega Cantero, 1979). This decree acknowledged the necessity of capital to fund and develop land development plans outside the sphere of private entrepreneurs as a way to increase land productivity. A later bill in July 1883 granted private companies permission to publicly fund or subsidize grand irrigation schemes (ibid). This increasing involvement of the state went in parallel with land reforms aimed at reorganizing the fragmented land property system by enforcing a small to medium farm model throughout the territory (Monclús and Oyón, 1988). According to Naylor (1959), it was at the end of the 19th century that land plot concentration began to be implemented by the state with rigid conditions about minimum size, production revenues and also capital for the venture.

Figure 1. Map of La Mancha including colonisation Sector I and the town of Llanos del Caudillo.



Source: Author.

The end of the 19th Century brought the Restoration of the Bourbon monarchy in 1875 (Carr, 1966). The loss of the last colonies in Cuba in 1898 represented the culmination of a period of decadence in Spain's history and provoked a re-examination of the national conscience (Abellán, 1973). As Nadal Reimat (1981) points out, the Restoration also signified a turning point for the development and consolidation of state-led hydraulic politics. Irrigation was seen by a group of intellectuals and politicians (i.e. the Regenerationists) as the major instrument with which to transform Spain's inland landscape and to develop the nation after the loss of the last colonies in 1898 (Driever, 1998; Swyngedouw, 1999). During this period, the state found a new role as developer of the hydraulic mission, which translated into large surface water irrigation plans and dams for irrigation and energy generation (López-Gunn, 2009; Swyngedouw, 1999). As for agriculture, the state moved from merely supervising private agricultural activity, to designing and building irrigation works and developing colonisation politics as the epitome of the public role in hydraulic politics (Mangas Navas, 1990; Naylor, 1967; Ortega Cantero, 1979, 1993).

The state's 'hydraulic Regenerationism' was primarily focused on making the desert flourish (Carr, 1966), and hydraulic politics were seen as the sublimated expression of both agriculture policy and the

nation's economic politics (Costa, 1911). Regenerationist theses saw irrigation as the ideal solution for changing the landscape of the country where the state is the guarantor of infrastructures and funding. The Regenerationists prioritized state participation in a general programme of public works as well as policies aimed at developing the country socially and economically (Ortega Cantero, 1979). They also instigated colonisation as a decisive instrument to solve the problems of agriculture in Spain (ibid).

During the 20th century colonisation plans were used as a non-conflictive alternative to more drastic agrarian reforms and a way of avoiding the deeper societal demands that such reforms would have represented (Ortega Cantero, 1993; Robledo, 1996). The first three decades of the century were characterized by 'integral colonisation', an indispensable complement to hydraulic politics bound to an agrarian and land reform through the aggregation of land plots concentration and reallocation of land properties (Naylon, 1959; Gómez Benito, 1995). In the 1930s, the newly created *Confederaciones Hidrográficas* (River Basin authorities) reclaimed increasing amounts of land through a general hydraulic policy framework used to coordinate irrigation and land management (Monclús and Oyón, 1988). However, it was not until 1932 during the Second Republic (1931 to 1936) that the state had the legal capacity to implement such plans (ibid). The Law of Irrigation Works of April 1932 established for the first time that the state would execute all irrigation works and secondary networks, as well as all drainage, houses and services in the lower Guadalquivir valley (ibid).

After the Civil War in 1939, the development of hydraulic politics and dam construction revisited Regenerationist postulates and acquired a new socio-political meaning to sustain the ideological and economic foundations of the newly installed dictatorial regime (Swyngedouw, 2007). Attempts to encourage and develop agrarian reform and colonisation through private initiative had proven unsuccessful before the 1950s, mainly due to a lack of involvement from landowners (Mangas Navas, 1990). Therefore, in the 1950s the state developed a new approach with a much more invested public role in colonisation. Autarchy measures also encouraged the regime to accelerate its internal institutional development and to re-assess colonisation politics for economic and social reasons (Gómez Benito, 1995). As Monclús and Oyón (1988) point out, the state used a more technical and more modern concept of colonisation at the centre of colonisation politics, focusing essentially on social progress driven by the economic transformation and development of the countryside.

What was different about these integral colonisation plans was that they aimed to reconcile the re-organisation of rural space with the acquisition of private land through reclamation and expropriation in order to build new settlements (ibid). This meant stabilizing land ownership as well as bringing workers and infrastructure to new areas (Naylon, 1959). The state played a predominant role in this initiative, guaranteeing the reclamation of land and development of projects that private initiatives could not have carried out. The move towards land concentration responded, according to Ortega Cantero (1993), to a more modern and rational approach to the economic benefits of colonisation, favouring the economic integration of agriculture and linking it with the general development of the country (ibid). The 1950s also represented the definitive union of hydraulic colonisation politics as well as the revitalisation of the 1933 General Plan of Hydraulic Works. Barciela López (2005) and Barciela López and López Ortiz (2003) argue that this law outlined the irrigation of more than 1,246,961 hectares (ha) with the effect of materializing the old Regenerationist hydraulic paradigm. This resulted in 287 dams built by the state between 1940 and 1963, with 132 dedicated to supplying water for irrigation only (Swyngedouw, 2007).

IRRIGATION AND COLONISATION IN FRANCO'S SPAIN: IDEOLOGY AND COMMUNITY

During the first two decades of Franco's authoritarian regime (from 1939 to the 1960s), colonisation politics became the cornerstone of both hydraulic politics and agrarian politics. The intention of

Franco's colonisation programme was as much ideological as it was economic and social. The state was to be the sole planner, financier, regulator and builder and so the transformation of the countryside through colonisation and irrigation became the most important element of agrarian politics (Ortega Cantero, 1993). Additionally during this period, the state became the sole enforcer of social, economic and political control over citizens (Carr and Fusi Aizpurua, 1979).

The development of large irrigation areas including villages was based on a new conceptualisation of agrarian politics aiming to improve the technical and economic viability of irrigation plans. This was in turn accompanied by an ideological and political apparatus following the postulates of an incipient agrarian fascism (Alares López, 2010), as well as an administrative structure of civil servants, engineers, and technicians ensuring its rationalisation and development. Within this structure, the role of the National Institute of Colonisation (INC) became essential in order to coordinate the different agrarian activities in the irrigated areas (Gómez Benito, 1995).

Colonisation acquired a new dimension beyond the political, becoming not only discursively embedded in every level of the political and social structure, but physically, producing new social realities in the form of towns via state control (Gómez Benito, 1995; Naredo, 1978). The process of allocating land aimed to create a new class of small landowners with the objective of increasing production and establishing a social consensus. Moreover, access to property was given a social function in this period, and for many reformists it was deemed a key means of preventing the advance of anarchism, instead creating stable structures that supported the established order (Malefakis, 1970; Monclús and Oyón, 1988).

The political apparatus developed around colonisation by Franco's regime also consisted of a specific ideology of peasantry and rural society. Within this ideology, the idea of the sovereignty of the peasant (defined as a small landowner with a family patrimony) was crucial in enabling the construction of a new rural social and economic class and structure (Murviedro, 1982; Naylor, 1959, 1967). Fascism focused on the essence of the Spanish national race in the peasant-farmer, both ideologically and discursively. This idea was then used as a central argument in colonisation politics to justify the regeneration of the countryside (Alares López, 2010).

Ideologically as well as politically, the ownership of land linked the institution of family with private property as the two main foundations of social order (Gómez Benito, 1995). The formula adopted to implement this vision by the Regime stated that small family land patrimonies would coexist with medium and large property as different forms of agrarian exploitation while maintaining the "unity of rural society" (Alares López, 2010). In Spain, the agrarian myth used by Franco portrayed a revision of the noble savage that was ideologically treated to suit the purposes of the regime (Gómez Benito, 1995). This type of populist discourse made use of themes such as the consciousness of the working and peasant class to construct an appeasing and calming image of the redefined farm owner. Whether rich or poor, the purpose was to discursively amalgamate any class categories such as peasants/cultivators/farmers within a social context (Brass, 2000).

The implementation of this 'peasant doctrine' also required bureaucratic and administrative changes (e.g. the creation of the INC in 1939), seen as a way of establishing spatial and territorial order "prior to the modification of the agrarian infrastructure" (Gómez Benito, 1995: 286-287). As Gómez Benito (ibid) wrote, colonisation became a technique to transform agrarian and economic planning through irrigation as well as to urbanize the countryside through new settlements. The creation of settlers and irrigation plots thus responded to the ideal of creating a hierarchical and disciplinary space in the countryside, "a technique of social transformation, both at its individual and communitarian dimension" (ibid) According to Murviedro (1982), fascist agrarian ideology required settlers to become new members of society imbued with the task of cultivating the land, embracing a new lifestyle and building

a new rural society that would maintain the purity of the peasant race and countryside. They would also become 'primordial' agents of colonisation through their careful selection and tutelage by the state (Gómez Benito, 1995).

THE COLONISATION OF LA MANCHA BY THE INC AND THE CONSTRUCTION OF LLANOS DEL CAUDILLO

The INC was established in 1939 after the Civil War in order to fulfil the objective of colonisation politics, i.e. to extend irrigation in order to increase agricultural production and address the three main problems affecting the countryside in Spain (EUA, 1985): (1) the lack of capital to complete irrigation works laid out by the *Confederaciones Hidrográficas* for secondary irrigation networks; (2) the lack of capital to develop irrigation projects, e.g. new terraces for agriculture, new jobs for farmers and settlement of new inhabitants; and (3) the need for irrigation training for dryland farmers. Immediately after the creation of the INC, the 'Law of Foundations for the Colonisation of Large Areas' was enacted on the 26th of December 1939 with the purpose to stimulate specific initiatives to transform dry land into irrigable areas of 'high national interest' with the support of the INC. The 1949 'Law of Colonisation and Allocation of Property in Irrigable Areas' represented a decisive step in the establishment of Franco's colonisation politics and its alignment with land politics (Monclús and Oyón, 1988). The INC determined which land would be reclaimed within the defined irrigation sector and regulated the different types of public investment and work sponsored by the state in the designated colonisable areas.

In La Mancha, rural unemployment was considered the major social problem in the area and served as rationale for state intervention via the INC (INC, 1952a). After studying the availability of groundwater, the INC concluded that the development of modern irrigation would be the solution to this problem. On 27th of April 1951 the INC declared an area of 49,500 ha in La Mancha of national interest for colonisation (INC, 1952a, 1952b).

The colonisation area of La Mancha was originally divided into three sectors but only Sectors I and II presented optimum conditions for irrigation and colonisation due to the fact that land preparation and land permeabilisation works were limited to land levelling (INC, 1950). In this area, the INC built two towns: Llanos del Caudillo in Sector I, and Cinco Casas in Sector II (Figure 1). Sector I initially comprised 2,000 ha of irrigable land (INC, 1954) and after land reclamation and expropriation procedures were completed, the dimensions of Sector I stood at 7 km wide (East-West) and around 5 km long (North-South) (INC, 1950; INC, 1955a). The decree approving the General Plan of Colonisation for Sector I in La Mancha was issued on 27th of November 1953 and the Construction and Work Plan for Sector I was approved on 21st of December 1954.

According to the General Plan for the Colonisation of La Mancha of November 1953, Llanos del Caudillo was planned as one of nine colonisation towns to be built by the INC in the province of Ciudad Real (Romano Serrano, 2005). The reclamation of land to build Sector I came with financial compensations as well as subsidies from the INC for the development of irrigation on properties exempt from expropriation and with planted vines or irrigation systems already in place (ibid). For Sector I, the INC purchased 319 ha from private owners for 4.7 million pesetas (equivalent to US\$429,223 in 1954) and expropriated 909 ha paying 3.7 million pesetas in compensations (equivalent to US\$337,899 in 1954). Two individual land purchases amounted to 1.9 million and 2.6 million pesetas respectively (equivalent to US\$173,515 and US\$237,442 in 1954) for 129 and 166 ha (INC, Informe del Servicio Inmobiliario). After various administrative procedures and appeals against expropriation by small and large landowners from Manzanares (73 owners in total, with 41 owning less than 5 ha and 9 more than 100 ha), 910.79 ha were declared un-seizable (deemed un-cultivable, partly built-up areas, irrigated already with exceptions made in some cases for local landowners). In order to protect private land property, the INC would make exceptions if landowners proved that they were irrigating the land

prior to its reclamation. In total, the INC expropriated an area of 1082 ha for the colonisation and irrigation of Sector I, divided into 23 sub-sectors, each one irrigated by one well (INC, 1954).

Following the 1955 Cultivation Project for Sector I, the INC planned to irrigate 720 ha divided into 15 sub-sectors in Llanos del Caudillo (INC, 1955a). Settlers arrived in Llanos del Caudillo in two phases: phase 1 – with 82 families between February and March 1955; and phase 2 – with 38 families joining in September 1955. The settlers' houses were positioned around a single urban nucleus with the aim of developing a particular style of 'popular architecture' (Flores Soto, 2010). This style focused on ensuring modern living conditions for the settlers (e.g. salubrious housing and living conditions) facilitating the 'moral rehabilitation' of the population (ibid) (Figures 2 and 3).

LLANOS DEL CAUDILLO: THE CREATION OF AN IRRIGATION COMMUNITY

The creation of new irrigation subjects: The settlers

The colonisation process in La Mancha began with the selection of suitable subjects after close scrutiny by selection committees specifically appointed by the INC. These committees reflected the local political power as they included: the mayor of the town; the secretary of the Brotherhood of Farmers (i.e. the state agrarian union); the commandant of the local police; the town doctor; the priest; and two well-known landowners (Gómez Benito, 1995; INC, 1955b).

Figure 2. Settlers walking on the main road of Llanos del Caudillo, 1950s.



Source: Archive, Ministry of Agriculture, Madrid, Spain.

Figure 3. Street view in Llanos del Caudillo.



Source: Archive, Ministry of Agriculture, Madrid, Spain.

The INC approved specific selection criteria for settlers in October 1942 (Mangas Navas, 1990): a) literate; b) older than 23 years or graduated from the Army and younger than 50; c) married or a widow with children; d) a farmer; e) without inherited physiological defects; and f) a person of acceptable moral and conduct standards. The selection committee would then evaluate each application along with a professional and health report as well as a report from the police stating any past political activities and potentially dangerous ideological tendencies (Romano Serrano, 2005). Two additional requirements were taken into consideration by the selection committees for Llanos del Caudillo: 1) to own land in what had been designated as Sector I of La Mancha; or 2) to be leasing land in any of the estates included in Sector I. The INC's General Rules on the selection of settlers emphasized that priority should be given to those applicants with proven knowledge of irrigation techniques (INC, 1955b).

The various selection committees across the province of Ciudad Real received 351 applications, finally accepting 178 candidates (INC, 1955b), selected from towns and villages in La Mancha (e.g. 31 from Alamillo, 27 from Herencia, 28 from Tomelloso). Of the 84 unsuccessful candidates, 46 were turned down on grounds of dubious moral qualities and conduct (ibid). Once selected, the INC oversaw their training in modern irrigation techniques since most came from dry land farming areas (Romano Serrano, 2005). The INC also established administrative contracts with all new settlers with the effect of binding them to the state. Moreover, settlers were obligated to form syndicalist groups in order to maintain good social and economic relations between all plot owners (Mangas Navas, 1990). Through this contract, settlers were also asked to pay 51 percent of their harvest back to the state in order to compensate for the initial investment made by the state in building the town and the colonisation sector.

Upon arrival, settlers were given a cultivation kit, which included different tools, seeds and livestock for their agricultural use in the land plots. Each settler family was given a 6 ha land plot to cultivate. Social control was exercised over the settlers through both an initial five-year tutelage period and a rigid hierarchical social structure within the town. During the five-year tutelage period settlers had to follow a strict plan of cultivation set up by the INC, defining productivity levels per month and per year as well as different production targets (Romano Serrano, 2005). The system of tutelage imposed by the INC followed a rigid structure whereby the settler was directly supervised and controlled by a foreman, who was in turn supervised by an agricultural INC technician in charge of the town. An agrarian engineer from the INC was then in charge of the whole irrigation sector (Oyón, 1985; Romano Serrano, 2005).

Strict targets imposed on agricultural production were often a source of conflict between settlers, foremen and the INC (Romano Serrano, 2005). In some instances, the INC initiated procedures to expel settlers from Llanos del Caudillo due to non-compliance with cropping targets and personal offences against foremen. In other cases, settlers were made to leave the town for not meeting production quotas and deadlines established by the INC (Closas, 2013). Missing expected production targets became a major cause for the continuous exodus of families (Ortega Cantero, 1972; Peperkamp, 1972). On the 23rd of February 1957, eight settlers in Llanos del Caudillo left due to difficulties with the cultivation and exploitation of their land plots. Then, in December 1958, an additional 25 settlers abandoned their plots and houses. By September 1959 however, the INC had already replaced them with 25 new families (Closas, 2013).

The social hierarchy in the town was also reaffirmed through differences in housing. As Romano Serrano (2005) wrote, four types of houses were built dividing the inhabitants of the town into four categories: settlers, agrarian workers, business owners and civil servants or servicemen (teachers, a doctor and a priest). The higher salary for engineers and foremen reinforced the social and economic distinction of these two professions in contrast to the settlers. Once the five-year period of tutelage was complete, the settler was able to start repaying the investment made by the INC with revenues from crops and harvest. This process would normally take between 15 and 25 years, not including the value of the house which would take up to 40 years to repay (Oyón, 1985).

The construction of the settler's community: Creating a new socio-political space in La Mancha

The process of creating new irrigation subjects ran concurrently with the construction of a new social space: the colonisation town. The planning and design of Llanos del Caudillo responded to a very specific ideology of the rural community and its social relations (Romano Serrano, 2005). In this newly designed space, the rural neighbourhood unit was understood as the basic organisational element of the new countryside (Alvaro Tordesillas, 2010). As part of a new politics of 'space domination', discipline and control, the INC created new services and facilities in the town, assimilating rural life to that of cities with sports grounds, parks, and a community centre alongside more traditional institutions such as the church (Monclús and Oyón, 1988; Ortega Cantero, 1979). The provision of these services encouraged the development of a communitarian life thus ensuring the permanence of the settlement (Oyón, 1985).

Construction plans for new towns had to incorporate ascetic moral and doctrinal standards (Rabasco, 2009) and sought to consolidate the power of the Regime and exercise social control over the settlers (Monclús and Oyón, 1988). Construction projects experimented with new avenues in rational urbanism and architecture as the design of the towns was limited by a lack of construction materials, simplicity in layout and austere economic measures (Rabasco, 2009). As Rabasco (2009) also wrote, the type of architecture used in planning the towns reflected the power and rule of Franco's regime. Hygiene, order, planning and regulation of the urban space in these enclaves revolved around the

colonisation settlements as 'nuclei of agrarian production' and were aimed at purporting a specific morality in its housing plans (Monclús and Oyón, 1988: 369). Thus, "the formal character of the settlement" (Monclús and Oyón, 1988) reflected the civilizing mission of the towns according to Franco's regime. The town was created as a physical as well as an ideological space: a disciplinary arena and a receptacle of state-power subjugating the newly created 'irrigation subjects' to state rule and control (Figure 4).

The explicit intention of these colonisation towns was to organize rural life and reproduce the ideal 'village' as the maximal expression of the traditional agrarian order (Gómez Benito, 1995). In this way, the rational design of the town became a metaphor for the purity of its inhabitants and the expression of the political project behind Franco's National Movement (Romano Serrano, 2005), defined under a "unitarian mentality of valuing the agrarian space" (Alares López, 2010; Monclús and Oyón, 1988). The design of the town reflected the main aspects of the new National-Catholic way of life of Franco's regime, characterized by family, property and cooperation. According to the new fascist ideology, family was one of the pillars of the state. It was thought that the development of small family-owned farms would both sustain these values and help fight the communist threat by stabilizing local communities through hard work and land ownership (Ryan, 2009). Women were taught moral and family values as the pillars of family and social unity (Gómez Benito, 1995) and, inside the town, social structures and cultural life were also dominated by national colonisation politics. The Falangist movement controlled the spread of propaganda and social and communitarian structures within the town, and the *Casa del Movimiento* (House of the Movement) delivered courses on culture, society and farming techniques to the settlers (Romano Serrano, 2005).

Figure 4. Aerial view of Llanos del Caudillo, La Mancha.



Source: Archives, Ministry of Agriculture, Madrid, Spain.

The INC's propaganda magazine *Vida Nueva* (New Life) glorified life in the countryside, praising the 'sacrifices' settlers were making for their country. It also commended rural life, tradition and folklore while exalting the work of the INC in modernizing the countryside and agriculture: "The land will be yours ... Look around you. The land that surrounds you has changed profoundly; remember that only yesterday this land was like the one you see far away; (...) Now (...) water shines under the sun and a new town is born and you live in it" (*Vida Nueva*, March 1956).

GROUNDWATER AND THE IRRIGATED LANDSCAPES OF LA MANCHA

In the 1940s, the Ministry of Agriculture and the INC initiated a drilling campaign across the country, supported by the first hydrogeological studies and the improvement of drilling techniques and groundwater abstraction technology (Closas, 2013). Between 1954 and 1965 the INC drilled 1588 wells representing a total drilled depth of 212,984 meters (compared to 2611 meters drilled between 1939 and 1954) (Fornés and Senderos, 2002). In 1945, during the initial planning phase for Llanos del Caudillo, the INC highlighted the groundwater potential of the area, noting the large proliferation of shallow wells and private irrigation networks (INC, 1945). Preliminary observations established a groundwater-abstraction potential of 20,000-25,000 l/s per well, capable of sustaining a total of up to 25,000 ha of irrigation (INC, 1950). Based on these studies, the INC underlined how the construction of wells had to be favoured 'as much as possible' (Figure 5) (INC, 1945). In July 1951 the INC carried out prospection works setting up 18 exploratory drills with 25-m and 52-m deep boreholes with vertical pumps to validate the hypothesis that a vast subterranean reservoir of water existed under La Mancha (INC, 1950). The INC dug two 2-meter diameter wells until it reached the first aquifer layer, then drilled a 0.40 meter diameter borehole to explore the successive layers of the aquifer, studying the ground structure and learning about the depth and permeability of the different layers (INC, 1952b).

Figure 5. Test drilling in La Mancha, 1950s.



Source: Archive, Ministry of Agriculture, Madrid, Spain.

At the time, traditional irrigation in La Mancha had relied on animal-powered water wheels (called *norias*), introduced by the Arabs (Glick, 1996). The hand-dug well for these *norias* would reach up to 20 meters deep, typically irrigating a land plot of 1 to 2 ha. Such small-scale irrigation systems were developed as a complement to dryland farming and barely sustained household consumption (Closas, 2014). According to the 1962 agrarian census, there were 13,205 *norias* in the area of Llanos del Caudillo (*ibid*). The level of adoption of modern groundwater abstraction technology was limited to a very small number of farmers, with only 2815 wells with modern pumps installed in the whole province of Ciudad Real. During the 1950s, only a little over 3000 ha were irrigated with modern pumps in Ciudad Real (and 236 ha with 175 groundwater wells around Llanos del Caudillo) (INC, 1950).

The entire irrigation system in Llanos del Caudillo depended on groundwater. During the construction phase, the INC considered wells and other major infrastructure such as irrigation canals and power generators for the pumps as 'works of common interest', funding 40 percent of their investment value. As part of its activities in Sector I, the INC drilled 23 groundwater wells that would sustain irrigation in each of the 23 sub-sectors (Closas, 2014). The wells were directly managed by the INC (with appointed technicians for operation and maintenance) (INC, 1953). Drainage ditches in land plots and mobile irrigation infrastructure (i.e. sprinklers) were all considered 'works of private agrarian interest' with 30 percent of their investment value funded by the INC. In order to carry out these works, the Ministry of Agriculture leveraged additional funds to level the land for irrigation and for groundwater test drilling in Sector I (Closas, 2013). These funds were part of the 55 million dollar aid package approved by the USA Senate to help finance Spain's reconstruction during the Cold War due to Spain's alignment against the Soviet Union (Calvo-Gonzalez, 2006).

Using groundwater, the INC planned to increase cropping intensity during the annual crop rotation in each land plot. Each plot was divided into four cropping sections, each with a specified crop rotation and cultivation sequence. The INC also introduced two pilot irrigation plots with sprinkler irrigation tests and hybrid maize (Closas, 2013). Through irrigation, the INC experimented with cropping intensity and promoted water-intensive crops such as fodder crops (e.g. barley, alfalfa) with large national and international market demand (Peperkamp, 1972). The INC also planned to cultivate vegetables and fruit and unsuccessfully attempted to encourage the cultivation of tobacco in La Mancha (*ibid*). Irrigation in Llanos del Caudillo was sustained by foremen in charge of training settlers (Romano Serrano, 2005). Recruited from areas with historical irrigation tradition (e.g. Murcia, Valencia), these foremen not only supervised the settler's agricultural production but also the correct use of irrigation techniques for agriculture (EUA, 1985).

Groundwater was provided to the settlers at a cost. The INC calculated groundwater and irrigation tariffs in Llanos del Caudillo for each settler as a ratio between the consumption of electricity and the general costs of maintenance and operations of wells (INC, 1958). Due to variations in water availability and yields tariffs had to be constantly revised. Further problems arose from the adjustment of the water tariff for different harvests and crops. A new credit had to be issued by the INC in February 1957 in order to pay for the maintenance and operation costs of the wells in Sector I of La Mancha due to unmet agricultural production targets in the previous year (*ibid*). In 1958, the INC Delegation of Ciudad Real revised and modified the tariffs, pointing out the need to establish a maximum irrigation surface and a water abstraction cap for each well according to the water irrigation requirements of each sub-sector (*ibid*).

With the advent of additional modern agricultural technologies (e.g. sprinklers) and mechanisation, the 6 ha irrigation plots became too small and less productive and in 1971 the INC expanded the plots to 9 ha (IRYDA, 1980). Moreover, stringent re-payment conditions to the Ministry of Agriculture caused the emigration of younger generations out of Llanos del Caudillo (Romano Serrano, 2005). In view of this situation, the National Institute of Reform and Agrarian Development (*Instituto Nacional de*

Reforma y Desarrollo Agrario) (IRYDA), successor of the INC (created in 1973 with the task of stimulating both agrarian enterprise and private irrigation works), gave priority to the acquisition of land plots by the descendants of settlers in Llanos del Caudillo (Closas, 2013). It was hoped that this would increase the cultivation surface of land plots, enabling higher productivity and economies of scale. The IRYDA then expanded the designated area of Sector I by annexing the neighbouring Sector III (996 ha) and allocating more land plots to the descendants of original settlers (Romano Serrano, 2005).

A BRIEF ASSESSMENT OF FRANCO'S COLONISATION PROJECTS

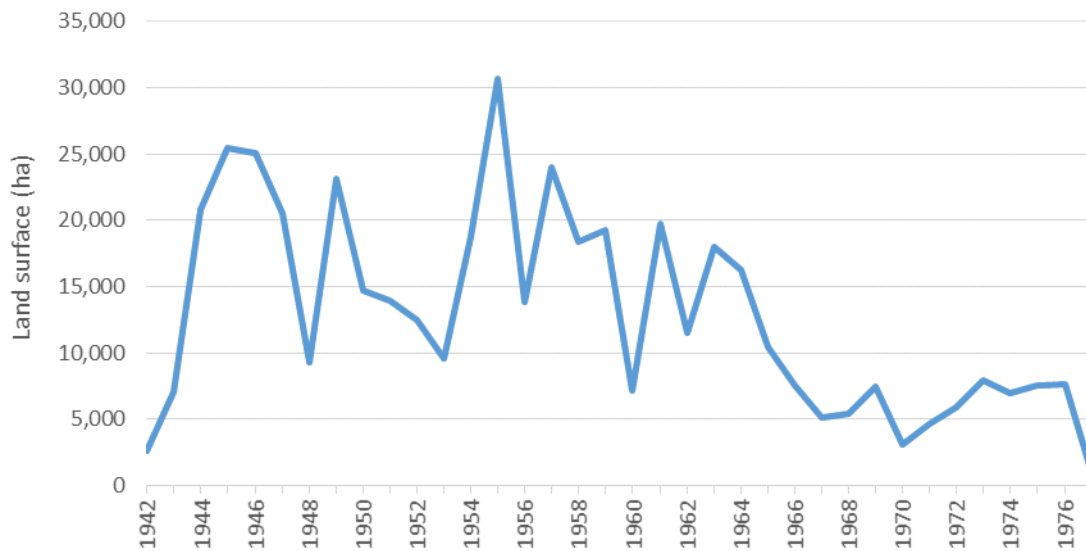
Despite the grand declarations and its scientific approach (Camprubi, 2014), the overall result of Franco's colonisation experiment was not particularly successful. It lacked realistic objectives as it was imbued with ideology from its very creation. Its implementation remained partial and symbolic (Gómez Herráez, 1999). The fact that agrarian reforms aimed to perpetuate the land property structure (Swyngedouw, 2015) did not help with the real transformation of dry land into irrigation. By 1975, the IRYDA had mobilised around 28,700 settlers in over 149,000 ha (of which around 38,800 ha were irrigated) (Ponce Herrero and Sanchez-Rubio, 2015; Swyngedouw, 2015). In La Mancha, by 1968 the INC had put under irrigation over 4000 ha compared to 40,000 ha privately irrigated (1974 data) (Pillet Capdepón, 1989). This groundwater-based revolution continues to change La Mancha today. By the mid-2000s the irrigated area reached over 180,000 ha and led to subsequent problems of groundwater over-abstraction (Closas, 2013, 2014).

Data by Mangas Navas (1990) shows large fluctuations in the number of hectares acquired by the INC and IRYDA between 1947 and 1977 (Figure 6), indicating an inconsistent policy of land acquisition and reclamation. Land colonisation was affected by structural problems concerning land plotting, availability of land, and the respect of private property. As Monclús and Oyón (1988: 171) point out, these problems arose from the difficulties of "completing a full reorganisation of land plotting" due to the existing property structure.

Colonisation also exhibited practical contradictions as the definition and allocation of land ownership was explicitly overruled by the Regime to maintain the interests and privileges of large landowning classes (Ortega Cantero, 1979; Swyngedouw, 2015). The fact that land distribution remained largely unchanged was due to the ideological and foundational pact drawn with the landowning classes after the Civil War. Despite its populist proclamations, the ideological and political contradictions of colonisation and irrigation politics carried out by the INC only brought about a timid confrontation with large landowners (Alares López, 2010). Colonisation politics did not directly affect many families (as at 1975, a little over 28,000 settlers had been established in irrigated areas, with a national average of 6.1 ha per settler) (Bosque Maurel, 1984). This was due to the fact that the INC would purchase rather than expropriate most of the land declared for irrigation, and that due to different legal loopholes, most landowners were able to keep part of their land in the declared areas to be irrigated while benefitting from government subsidies for irrigation (Closas, 2014).

During the 1960s, government technocrats were particularly influenced by liberalising policies suggested by the International Bank of Reconstruction and Development aimed at reforming Spain's economy and agriculture (Closas, 2013). The INC was thus dissolved and replaced by a new organisation (IRYDA) and different decrees and state-sponsored credits helped small farmers modernise their farms and increase their productivity. These credits, which granted more than 780 million dollars to farmers to invest in new irrigation structures, were in high demand and the state had to extend various credit lines to the IRYDA in order to continue promoting farmers' private initiative in irrigation (Closas, 2014).

Figure 6. Total land surface acquired by the INC-IRYDA in Spain (1942-1977).



Source: Data from Mangas Navas, 1990.

CONCLUSION

This study has analysed the role of colonisation, irrigation, and groundwater in the development of Spain's hydraulic mission. As it has been examined, through the development of irrigation infrastructure, colonisation politics in Franco's Spain materialised as a new reality, the settlement village created a public domain of hierarchical institutional relations between the state and its subjects. Colonisation and irrigation plans in Spain became part of a wider narrative of agrarian reform aimed at the social transformation of the Spanish countryside. The development of towns such as Llanos del Caudillo created new agrarian geographies and re-shaped communal structures in the areas where irrigation projects were built (Romano Serrano, 2005; Swyngedouw, 2007).

These projects became embedded in a doctrine of social change and modernisation framed by the Regime around an ideological discourse of rurality and peasant sovereignty (Gómez Benito, 1995). Social hierarchy, discipline and land ownership were structured in publicly colonised areas in order to preserve the ideological and social foundations of the fascist regime in the countryside. Colonisation became part of a wider political project driving the development of the country, fabricating new rural socio-political and economic structures as materialisation of state power over specific groups of individuals.

Overall however, Franco's colonisation project lacked realistic objectives and tangible results mainly because it was ideological since its very creation. Its implementation remained partial or symbolic (Gómez Herráez, 1999) and the fact that agrarian reforms also aimed to perpetuate land property structure did not help with the transformation of dry land into irrigation. Colonisation also exhibited practical contradictions as the definition and allocation of land ownership was overruled by the Regime's desire to uphold the interests and privileges of the large landowning classes (Swyngedouw, 2015). Nevertheless, colonisation through irrigation exposed dry-farming areas to the wealth of water resources. In La Mancha, groundwater began to be abstracted by the INC and supplied to new settlers through modern technology (e.g. electric pumps, wells, sprinklers) in a landscape of subsistence and marginal irrigated agriculture with traditional abstraction techniques.

Other historical cases of agrarian landscape transformation under dictatorial regimes such as Italy's river marshes drainage in the 1930s (Caprotti, 2008), and the 'organic design of space' in the colonization of Eastern Europe under Nazi Germany (Blackbourn, 2006) make clear that, as well as in Spain, these projects responded to the will of authoritarian government apparatuses to dominate and transform both society and nature through the creation of modern rural landscapes. With the case study of Llanos del Caudillo, the role of state-led rationalized spatial plans becomes further contextualized alongside these international examples, showing its political and discursive role. These comprehensive and transformative schemes emphasized the government's socio-natural view of society: i.e. instituting and entrenching modern agricultural and irrigation practices around a newly created social and political order. However, the vision they purported of a technocratic socio-natural re-engineering of the countryside would often lead to failure, as they remained completely disconnected from the realities on the ground and fraught with internal ideological and political contradictions.

In this study, the role of groundwater in the creation of irrigated landscapes has also been substantiated, appearing as a relevant piece in the history of Spain's hydraulic mission. Given its abundance in La Mancha, groundwater became essential to supporting the state's irrigation and colonisation projects and, despite the poor results of Franco's plans, they can be seen as part of the origin of a groundwater-based revolution which transformed the area (e.g. Bromley et al., 2001; Brufao et al., 2002; Closas, 2014; Martínez-Santos et al., 2008; López-Gunn et al., 2012). Even though the role and scope of groundwater-based irrigation by the state was limited to those areas out of reach from surface water irrigation networks, the local impact of state investment in groundwater irrigation spurred the race to the bottom of the aquifer in La Mancha. Against this backdrop, considering the use of groundwater in Spain's colonisation politics provides an additional insight into the country's hydraulic mission and the social, political and technological facets of the development of modern irrigation.

ACKNOWLEDGEMENTS

The author would like to thank St Hilda's College and the Jenkins Memorial Scholarship for their support during this research (2010-2012) as well as Dr. Rob Hope, University of Oxford, for his supervision. Nacho Prieto and Gaspar Carmona at the National Archives of the Ministry of Agriculture in Alcalá de Henares provided valuable archival support. The original draft was improved with the comments and suggestions of two anonymous reviewers.

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