

# **An analysis of the small planned towns built for the workers of the Badajoz Plan dams in Spain**

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One of the most interesting urbanistic ensembles of the 20th century in Spain is the towns planned and built near the large dams to provide services for their construction and operation. In the Province of Badajoz four very large dams were built by the central administration, which also promoted the construction of workers' towns in the surrounding area. These towns are unique components of the rural Extremadura landscape. Without them, the dams could not have been built in the Spain of Franco's dictatorship, and they are a testimony to action carried out in the territory, how work was organized and how the integrating relationship of buildings and nature was understood as a particular conception of the landscape. This article first reviews the historical context, both from the point of view of planned urbanization concerning company towns and the Badajoz Plan itself. The villages are describe based on field visits and documents found in the AGA archives in Alcala de Henares and the offices of the Guadiana Water Board in Mérida; lastly, the data are analyzed, and some conclusions are arrived at.

Keywords: planned cities; workers' town; Badajoz Plan; dams

## **Introduction. The Badajoz Plan**

The "Transformation, colonization, industrialization and electrification plan for Badajoz Province", better known as the Badajoz Plan, was an ambitious project of territorial

zoning and industrialization approved in 1952 by the Central Government, carried out in the Province of Badajoz, Spain (Figure 1). This plan was one of the first "provincial plans for economic and social planning" promoted by Franco's dictatorship through a 1946 law, designed to "increase the standard of living and the national income per inhabitant" <sup>1</sup>. It consisted of irrigating around 100,000 ha located in the province of Badajoz, in Extremadura, for which it was necessary to build various infrastructures such as dams and canals. Extremadura was sparsely populated and lagged considerably behind other parts of Spain, such as Asturias, the Basque Country and Catalonia, in industrial terms <sup>2</sup>, and the plan was designed to industrialize and repopulate the area - 60 new villages were built to house some 12,000 settlers - and to turn the area into one of Spain's market gardens <sup>3</sup>.

The climatic, soil and topographical conditions in a large part of the province of Badajoz along the Guadiana river were excellent for irrigated crops; however, the main watercourses in the area, the aforementioned Guadiana river and its tributary the Zújar river, have a very irregular water regime and low annual flows which, on occasions, do record a certain amount of rainfall in the catchment area. The solution to this shortfall was resolved by the construction of four large hyper-annual regulation dams, located upstream of the areas to be irrigated in order to regulate the river and store the excess flow in the rainiest years. The dams, called Cijara, García de Sola (or Puerto Peña),

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<sup>1</sup> Martín Lobo, "Realidad y Perspectiva de La Planificación Regional En España."

<sup>2</sup> Gaviria, Naredo, and Serna, *Extremadura Saqueada. Recursos Naturales y Autonomía Regional*.

<sup>3</sup> Sánchez Sánchez-Mora, "El Proceso de Colonización En Extremadura (1952-1975): Sus Luces y Sus Sombras."

Orellana and Zújar, were built in the 1950s; taking advantage of their existence, hydroelectric power plants were also projected on them, allowing the installation of 71,000 kW of power.

It should be noted that the rainfall and flow regime in Spain has led to the construction of important dams since Roman times, through the Renaissance and the Age of Enlightenment <sup>4</sup>; in the 20th century important constructions were carried out, from the El Chorro dam to the Alcántara, Aldeadávila or La Serena dams, both to irrigate fields and to obtain hydroelectric energy in a country with scarce energy resources of other types, so there was ample technical knowledge to carry them out, both on the part of the designers and of the construction companies<sup>5</sup>.

The plan was extended to 1975. Today, associated infrastructures continue to increase with construction of the Serena (1990) or Búrdalo (2016) dams. Two projects similar to the Badajoz Plan were the Tennessee Valley in the United States (starting in 1933) <sup>6</sup>,

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<sup>4</sup> Garcia-Diego, *Presas Antiguas de Extremadura*; Álvarez Martínez et al., “Arqueología de Las Presas Romanas de España: Los Embalses de Emerita Augusta y de Sus Alrededores. Estado de La Cuestión”; Plasencia-Lozano, “La Presa Renacentista Del Casar de Cáceres”; Bernabéu-Larena et al., “Use and Management in the Heritage Conservation of the Historic Water Supply of Canal de Isabel II, Madrid.”

<sup>5</sup> Berrocal Menárguez, Molina Holgado, and Del Cuviillo Martínez-Ridruejo, “Innovación En El Diseño de Centrales Hidroeléctricas a Principios de Siglo XX. La Ingeniería Arquitectura de Casto Fernández-Shaw En La Presa de La Jándula”; De las Casas Gómez, “El Pantano Del Chorro. Forma de Cálculo y Procesos Constructivos En Presas.”

<sup>6</sup> Kline and Moretti, “Local Economic Development, Agglomeration Economies, and the Big Push: 100 Years of Evidence from the Tennessee Valley Authority.”

incomparable example of the modern industrialization plans linked to a hydrographic basin, or the GAP begun in Turkey in 1970<sup>7</sup>. In the province of Cáceres, in the region of Extremadura too, a relevant territorial project was also developed for hydroelectric purposes in the 1960s<sup>8</sup>.

Figure 1. Map of the Badajoz Plan, showing dams, canals and main cities

In Spain at that time, it was common for industries that entered unpopulated areas to manage a natural resource in a specific location to create company towns for the workers, a fact that was framed by the somewhat social and paternalistic conscience emanating from the Franco's regime itself. Thus, companies that had mining concessions, such as the one in Alquife (1957 and 1962)<sup>9</sup> or of dams (Table 1)<sup>10</sup> built towns that showed the interest of businessmen in offering their employees a place to live with some wellbeing. The four dams were located far from the main population centres, so accommodation had to be built for the workers and technicians involved in the works. These new towns for dam workers had several antecedents. Firstly, the workers' towns (also called company towns) created in the United Kingdom during the Industrial Revolution, often in response to the poor quality urban working-class neighbourhoods of the 18th and 19th centuries. Prominent examples of these settlements were New Lanark in Scotland, built for 2,500

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<sup>7</sup> Altınbilek, "Development and Management of the Euphrates–Tigris Basin."

<sup>8</sup> Lozano Bartolozzi, "Poblados de Nueva Planta En La Cuenca Media Del Tajo"; Plasencia-Lozano, "Los Poblados de Las Presas, Urbanismo Para Obreros. Análisis Comparativo de Tres Conjuntos Singulares."

<sup>9</sup> Santofimia Albiñana, "Las Minas de Alquife En Granada."

<sup>10</sup> Teixidó Domínguez, "El Poblado Del Embalse de Alcántara: Un Ejemplo de Urbanismo En El Período de La Autarquía."

people in 1786 by David Dale and Robert Owen, Milford (1808, William McCrum), Tremadoc in Wales (1811, William Madocks) or Lowell in the United States (c.1820, Merrimack Manufacturing Company)<sup>11</sup>. There were also planned settlements in the late 19th century, such as the town promoted by the railway entrepreneur George Pullman in 1884 for 4,000 of his employees which included theatre, library and parks<sup>12</sup>, or Derry Church -later renamed Hershey-, built in Pennsylvania by chocolatier Milton Hersehy in 1903<sup>13</sup>. From the 20th century are Cokedale, Colorado, built in 1907 by ASARCO as a company town for producing lead and zinc, “carefully planned” according to Dandekar<sup>14</sup>, or Jamshedpur (originally named Sakchi) in India, built around a steel factory, developed over a number of plans<sup>15</sup>. Late in the 20th century some interventions on a regional scale whose purpose was to rapidly house a large number of people in various nuclei spread over an area can be cited. This is the case of the group of towns and borgos designed to colonise the Agro Pontino region in Italy, erected in the 1930s.<sup>16</sup>; the different residential complexes promoted by the mining company Ensidesa in Asturias, Spain,

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<sup>11</sup> Cooke, “Silicon Valley Imperialists Create New Model Villages as Smart Cities in Their Own Image.”

<sup>12</sup> Reiff, “Rethinking Pullman.”

<sup>13</sup> McMahon, “Milton Hershey’s World.”

<sup>14</sup> Dandekar, “Review Essay: Planned One-Company Towns and Unplanned Allegiances.”

<sup>15</sup> Sinha and Singh, “Jamshedpur: Planning an Ideal Steel City in India.”

<sup>16</sup> Martone, “Le Trasformazioni Territoriali Dell’area Pontina Nel XX Secolo. La Riconoscibilità Storica Dei Luoghi Nella Iconografia Tra Ottocento e Novecento: Alcuni Esempi.”

from the 1950s onwards, such as Llaranes (1954, Cárdenas y Goicoechea)<sup>17</sup>, or the planned nuclei of the new aeronautical industry in the Los Angeles area, California, in the early 1960s<sup>18</sup>.

However, the planned towns closest to the dams that are the subject of this work were the colonizing towns promoted by the National Colonization Institute (INC), created in 1939<sup>19</sup>. The nearly 300 towns built from 1945 to 1970 under the auspices of the INC were a reality that transformed the landscape of the Spanish countryside, with interventions in different areas of the country such as Aragon, Andalusia and Extremadura.<sup>20</sup> Within the framework of the aforementioned Badajoz Plan, as noted above, a total of 60 new villages were built, and many of them were erected in the vicinity of the dams; we therefore believe that the planners of the dam towns could not be unaware of them. Both may have been built simultaneously, and such matters as their design, repetitive elements, open spaces or the location of public buildings were often the same.

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<sup>17</sup> Tielve García, “Company Towns: Architecture and Paternalism. From the Compagnie Royale Asturienne Des Mines to Cristalería Española.”

<sup>18</sup> Karafantis and Leslie, “‘Suburban Warriors’: The Blue-Collar and Blue-Sky Communities of Southern California’s Aerospace Industry.”

<sup>19</sup> Villanueva Paredes and Leal Maldonado, *Historia y Evolución de La Colonización Agraria En España. Volumen 3. La Planificación Del Regadío y Los Pueblos de Colonización.*

<sup>20</sup> Alagón Lastre, “Los Pueblos de Colonización Del Plan de Riegos Del Alto Aragón y Su Emplazamiento En El Territorio”; Centellas Soler, “Los Pueblos de Colonización de La Administración Franquista En La España Rural”; Ojeda Rivera and Villa Díaz, “Paisajes Coloniales En El Bajo Guadalquivir. Origen, Evolución y Carácter Patrimonial.”

In order to complete the picture of the company towns, we can point out the existence of some temporary towns linked to the construction of dams: the Kinlochleven industrial village for the construction of the Blackwater Dam in Scotland (1905) <sup>21</sup> ; Camp O'Rourke, erected during the construction of the Roosevelt Dam in the United States (1903) <sup>22</sup>; and the El Vado village, planned by engineer Jose Salmeron in 1934 for construction of the El Vado reservoir in Guadalajara, which had a school and a library for workers <sup>23</sup>.

Table 1. Some of the large dams built in Spain, with year of completion. All of them needed a worker's new town. Those described in this paper are shaded. Towns were no longer built after 1980

### **The dam workers' towns**

As we noted, in the Guadiana Valley in the Province of Badajoz, the State promoted the construction of four towns to house personnel related to the construction of the dams<sup>24</sup>.

As was customary for the construction of dams, there were several types of workers' towns in the surroundings of those mentioned here. On one hand, the Spanish Government, which was the developer and owner of the dams, built a town for its workers, whose main mission was to direct and control their construction. In turn, the

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<sup>21</sup> Miller, *The Dam Builders: Power from the Glens*.

<sup>22</sup> Barrows, "Roosevelt Dam and the Salt River Valley."

<sup>23</sup> Fernández Izquierdo, Alloza Aparicio, and Díaz del Campo, *La Presa de El Vado y El Canal Del Jarama*.

<sup>24</sup> Plasencia-Lozano, "Los Poblados Construidos Por El Estado En Las Presas Del Plan Badajoz, Elementos de Urbanismo Planificado En El Paisaje Rural Extremeño."

companies in charge of the actual building (the contractor or contractors) built another town for their own workers. Finally, there was occasionally a third actor: the hydroelectric operating companies. These were usually electric companies that might also need to build their own facilities for their workers. Therefore, the construction of a dam involved the mobilization of several thousand people of different kinds, from engineers to foremen and laborers, and from auxiliary personnel to priests, teachers and mechanics for official vehicles. And to house them near the construction site in rural areas that were not prepared for the significant influx of population, residential buildings and others for equipment had to be built to enable them to live relatively comfortably.

The towns promoted by contractors were temporary constructions, sometimes limited to a series of wooden barracks, and none of them seem to have survived (at least within the scope of this study). However, the Government-built towns and those built by the operators of the hydroelectric plants were meant to be permanent and remain after construction to provide service during dam and canal operation. They were made up of various buildings for housing and services. Perhaps the most unique of all was the management and administration building, which usually housed offices for engineers, draftsmen and administrators, archive, plus rooms for important visitors.

In general, the Government designed a construction project for the town even before the project for the dam it was to serve was completed, and was constructed rather quickly so it would be finished before work on the dam began. The site for the town was chosen and a series of buildings for its workers were built. Furthermore, a site for contractor housing was designated next to it, and access roads and water mains, sanitation, electricity and telephone service were installed and maintained for the whole town. Thus, water supply was calculated taking into account the maximum number of inhabitants that all the towns together might eventually have.



## **Description of the towns in the Guadiana Basin in Badajoz**

### ***Cijara***

The Cijara dam originated at the beginning of the 20<sup>th</sup> century, before the Badajoz Plan, in the Gasset Plan <sup>25</sup>, which included the construction of a dam at that site. The first construction project in Portillo de Cijara dated from 1921, but a second project for it was designed by engineer Rodrigo Catena <sup>26</sup> in 1932, and work on it began the following year. Work was paralyzed during the Civil War, and taken up again at the end of the 1930s.

Catena also planned the town of Cijara, built in 1933, whose original project document is still unknown. It is substantially different from those of Orellana, Zújar and García Sola, designed two decades later. In this case, the State did not limit construction to the buildings necessary for surveillance and control, but also for all of the services necessary for the dam construction contract, starting with housing for all of the workers <sup>27</sup>. Thus, it erected a set of pavilions and buildings with elongated floorplans to house the workers along with their schools, health services, church, a test laboratory, washhouse, carpentry, mechanical shop, forge, storehouse for cement, cafeteria, tobacco shop, barber, theater-school, etc. Workers' buildings included differentiated housing for foremen and supervisors, guardhouse, hostel for singles and married couples, doctor's house, houses for draftsmen, for the chief engineer or for auxiliary professionals. A Guardia Civil post

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<sup>25</sup> Diaz-Marta, "Antecedentes de La Planificación Hidrológica En España y Propuestas Actuales."

<sup>26</sup> Tirado Cruz, "Proyecto de Capilla-Escuela Para El Poblado Del Pantano de Cijara."

<sup>27</sup> Flórez y Amo, "Proyecto de Edificios y Servicio Auxiliares Para La Administración, En El Pantano de Puerto Peña."

and hostel for personnel in transit were also built. Therefore, the town of Cijara, at least insofar as the buildings contracted by the State, is significantly larger than the others described here.

Figure 2. At the top, the management neighborhood; nothing remains today (1: management building; 2: engineer-in-chief house; 3: engineers houses; 4: doctor and draftsmen; 5: garage). Below, plans for the site management building in 1940 and 1952

The town consisted of the main buildings organized in groups parallel or perpendicular to each other, with some services, such as the health center, on the edges. The map shows a public square open to the road where services such as cafeteria, tobacco shop, barber and Guardia Civil headquarters were located.

The town built in 1933 was subjected to two circumstances that caused significant damage to housing, supply lines and the access road: the Civil War, when it was vandalized, and a strong storm around 1941. So between 1939 and 1942, reconstruction work was undertaken <sup>28</sup>. The engineer in these projects, Manuel Tercero, defined a series of new buildings for housing that included two novelties with respect to those already built: a small walled patio adjacent to the house and a new group of houses separate from the previous one, downstream from the dam, in an area where there was already a

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<sup>28</sup> Tercero Sánchez, “Proyecto de Ampliación de Las Viviendas de La Dirección Del Pantano de Cijara”; Tirado Cruz, “Proyecto de Reconstrucción de Un Grupo de Seis Viviendas En El Poblado Del Pantano de Cijara.”

warehouse and a power plant to supply electricity (Figure 2)<sup>29</sup>. Two more interesting projects at this time were the improvement in water supply in 1940, also signed by Tercero <sup>30</sup>, in which he alludes to 2000 people in the town and a supply of 50 liters a day per inhabitant, and the tiny chapel/school for 130 boys and girls (there were up to 400 children in total), designed by José Joaquín Tirado Cruz in 1942 <sup>31</sup>, as the original town, built during the Republic, did not have one (Figure 3).

Figure 3. Chapel/School, erected on a hill at one end of the town

The construction of the Cijara dam took quite a few years, perhaps because of the economic problems of the times. Approval of the Badajoz Plan in 1952 may have driven the construction of the infrastructure, for which various projects were designed in later years for renovation of buildings and supply lines. Among them was the one in 1954 which undertook substantial improvement of the village <sup>32</sup>. A comparison between the town layout at that time (Figure 2) and in 1940 shows how the town had grown: the chapel/school had been the seed for three new pavilions in the area, and the washhouse had disappeared, and a gas pump had been installed in the town square. During this

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<sup>29</sup> Tercero Sánchez, “Proyecto Reformado de La Reparación Del Poblado, Sus Servicios y Edificaciones Anejas a Las Obras Del Pantano de Cijara.”

<sup>30</sup> Tercero Sánchez, “Proyecto de Abastecimiento de Agua Potable Para El Poblado de Las Obras Del Pantano de Cijara.”

<sup>31</sup> Tirado Cruz, “Proyecto de Capilla-Escuela Para El Poblado Del Pantano de Cijara.”

<sup>32</sup> Florez y Amo, “Presupuesto de Gastos Para El Acondicionamiento Del Poblado En El Pantano de Cijara.”

period, another water supply improvement project shows the original town center created during the 40s<sup>33</sup>.

The three town centers have met different fates over time. The management center has been completely eliminated. The original town now makes up the center called Poblado de Cijara, which administratively is part of the town of Alia. The pavilions are now houses in the town center, and the auxiliary buildings have been reconverted into housing or abandoned, while the chapel is now the parish church. The town is now permanently inhabited by several families (Figure 4).

Figure 4. At top, aerial view of the town in 1957 and in 2019. At bottom, view of some barracks

Perhaps the most interesting area is the part of the town at the foot of the dam. Contrary to the 1956 plan, there is a larger section of twenty-some buildings, with layout, architecture and style reminiscent of an industrial village (Figure 5), possibly erected by the operating company.

Figure 5. Up: planned town near the dam in 1956. Some more constructions were built. Bottom: view of several buildings in the part of the town downstream of the dam. On the left, engineers' houses; on the right, church and school

### ***Orellana***

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<sup>33</sup> Florez y Amo, "Proyecto de Nuevo Abastecimiento de Agua Al Poblado Obrero Del Pantano de Cijara."

The Orellana dam was built to deviate water to the canal on the right bank of the Guadiana in Vegas Altas forming a counter-dam regulating the Cijara-Puerto Peña system. The town was designed by civil engineer Luis Ponte before the dam construction project was finalized in 1954<sup>34</sup>. Contrary to the town of Cijara, the project did not include buildings or housing for the contractor's personnel, as it was considered preferable for the contractor to define its own space. However, it mentioned that the construction that was planned could serve as a model or guide for them. Water supply was calculated based on 100 liters per person and day for a population of 1000.

The buildings planned in the main part of the town consisted of 17 housing units with walled patios, washhouse and chapel/school (Figure 6). Two draftsmen, a typist, a general manager, three security guards, a laboratory assistant, two managers (supply and sanitation), two drivers, two general guards and a priest would stay in them. Pinches, telephone operators, errand boys and cleaners were considered to be relatives of other employees and would not need separate housing. Two buildings were planned for housing auxiliary personnel and three for foremen and supervisors, and the remaining 12 units were grouped together in one building, "although with three different designs in it to break the monotony," according to the final report. A group of buildings to be built by the contractor for its personnel would later be attached to these until completing an urban block. The chapel/school would be built in the center on the main side of the final block.

Figure 6. Block planned. The patios of the housing units face the inside of the block. In the right, description of model houses A and B.

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<sup>34</sup> Ponte, "Proyecto de Edificios Auxiliares Para La Administración Del Pantano de Orellana."

The management and control buildings were next: the site management building, the chief engineer's residence, two houses for assistants (one for the dam and the other for the canal) and a testing laboratory for materials. Planned in greater detail was the site management building, which consisted of a large two-story building with pergolas, porches and verandas that provided shade and cavity walls to buffer the summer heat, and also had "...a room with a door onto a semicircular terrace that will be a splendid overlook of the dam." The chief engineer's residence, with Andalusian motifs, had two irregular-shaped floors for shade and to adapt to the terrain. Both buildings had heating (Figure 7).

Figure 7. Top: site management building. Bottom: chief engineer's residence

The town was located on a hill with views of the dam, on lands that were economically expropriated, and after the reservoir filled, would become a peninsula. According to the Final Report, the new buildings were not intended to connect "...to the town so as not to disturb its urbanization, rather modest in fact, but without neglecting its own urbanization, since some day it could become a neighborhood of the town, and so it should be somewhat respectable." The closeness to the town had evident advantages in terms of logistics, and furthermore avoided the need for buildings for medical services and pharmacies, Guardia Civil post, etc.

The management buildings were located in two different zones. The site management building, garages and housing for assistants were located on one side of the hill, with views of the dam and road leading directly to it (the road later flooded), while the chief engineer's residence was planned on the righthand end of the dam near the laboratory and a storehouse, which was located there so it could be reused later as a control building for the Orellana canal that originated at the foot of the dam.

However, important modifications were made to the project during construction<sup>35</sup>. It was decided that the site management building should include housing for the two foremen, two assistants and a storeroom. In the town, the idea of shaping half a block around the church was replaced by the construction of a residential building for assistants, the washhouse and garage. So, the town of Orellana ended up being a series of buildings scattered over several kilometers (Figure 8).

Figure 8. Top: the town as planned; bottom: the as-built town at the time of liquidation of construction in 1960.

The original project, however, was kept as a model for later towns, so that the buildings planned by Luis Ponte for Orellana were finally built elsewhere (Figures 9, 10, 11).

Figure 9. Current view. 1: worker's neighbourhood; 2: engineer-in-chief house; 3: management center; 4: chapel/school

Today there are two alignments of worker's houses. Perhaps the second was part of contractor housing, since they have different entrances and their quality is somewhat lower. The rest of the buildings also remain, with their roofs apparently in good repair, but currently abandoned. The administration building is a splendid two-story building with patios, galleries, balustrades and terraces in a layout that occupies an area of 1000 m<sup>2</sup>.

Figure 10. Chapel/school. The roof consists of a cupola made up of three brick rings, with a directrix of parabola

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<sup>35</sup> Ponte, "Liquidación de Los Edificios Auxiliares y Carretera de Servicio Del Pantano de Orellana."

Figure 11. The town at present. Top, the block located further south; bottom, the site management building

### *Zújar*

The Zújar dam was conceived to regulate the flow of the Zújar River, to irrigate the left bank of Vegas Altas del Guadiana and to contribute to irrigation of Vegas Bajas. It also made use of the waterfall up to the entrance to the canal. The town was planned in 1954 by engineer Mario López Sánchez <sup>36</sup>, who was also the designer of the dam, taking the town of Orellana as its model. He proposed a similar calculation of water supply lines, assuming the same supply for a similar planned population (1000 pop.) and reproduced to the millimeter all the buildings, from site management to water filtration (Figure 12).

The town center was comprised of 12 housing units for government workmen around a square, with a chapel/school in the center of its longest side. As in Orellana, three models were alternated for variation. Auxiliary personnel housing was near this square. The site management and administration building, the chief engineer's residence, two houses for assistants and the laboratory were in a group set apart. In addition, it was considered necessary to have a Guardia Civil post (the only building with a new design with regard to Orellana).

Figure 12. The map shows both the water supply infrastructure with a 500-m<sup>3</sup> capacity tank and sanitation. Around the town's buildings, land was reserved for the construction contract workers ("poblado obrero")

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<sup>36</sup> López Sánchez, "Proyecto de Edificios Auxiliares Para La Administración En Las Obras Del Pantano Del Zújar."



The project was laid out in three buildings zones, all on the left bank of the river, because that is where the service road was. The management center was about 250 m from the dam on the back of the supporting hill on the lefthand side. The town center was planned about 1500 m from the dam on a plain with enough space for contractor housing. Finally, on a hill half way between one zone and the other, there was to be a Guardia Civil post.

In reality, the as-built project, which was under construction from September 1954 to December 1958, differed quite a lot from the plan. The buildings in the management zone remained, but with a slightly different distribution than originally foreseen. The chapel/school was built where the Guardia Civil post was supposed to be, but never built (Figure 13). Finally, nothing remains of the square originally designed. Instead, two blocks similar to those found in the Orellana plan were built, along with housing blocks for supervisors and foremen near the church. These changes were not shown in the settlement project <sup>37</sup>, which is limited to showing a few minor changes such as omission of the washhouse because the housing units each had a laundry tub. Furthermore, today there is a town downstream from the dam, which may have been the builder's or of the hydroelectric operator, Saltos del Guadiana. This town is currently inhabited and has simple one and two-story rowhouses (Figures 14, 15).

Figure 13. The chapel/school. It differentiates from the one in Orellana in its buttresses, which were not present in Lopez's project either.

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<sup>37</sup> López Sánchez, "Liquidación de Las Obras de Edificios Auxiliares Para La Administración y Camino de Servicio Del Pantano de Zújar."

Figure 14. Present day view. Top: whole complex. 1: town of unknown origin mentioned; 2: church and worker's housing; 3: site management. Below, details of neighborhoods 1 and 2

Figure 15. At top, dam and the town downstream; at bottom, street and buildings

### ***García Sola***

The García Sola dam on the Guadiana River was conceived as a Cijara counter-dam 35 km upstream from it. The project was drawn up in 1954 by engineer Juan Florez, who was also in charge of designing the Government town<sup>38</sup>. In the Final Report, the author admitted its having been based on the town of Cijara, on Luis Ponte's Orellana project, and on ideas from a project for the dam drafted in 1945, which preceded his. Like Zújar and Orellana, in García Sola the idea was to build Government housing, but the water supply lines were planned for future contractor personnel as well. Water supply was calculated for a population of 1000 and 100 liters per person per day.

The town was laid out in two zones (Figure 16). One for management, with the site management and administration building, the chief engineer's residence and houses for two assistants. The main area was comprised of 22 housing units for families of permanent workers and two more for temporary workers (the administration staff, apart from the engineer and the assistants who stayed in the management area, was made up of a draftsman, an administrator, a typist, a manager with his assistant for the laboratory, four work supervisors, two managers for the water supply and sanitation, three

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<sup>38</sup> Flórez y Amo, "Proyecto de Edificios y Servicio Auxiliares Para La Administración, En El Pantano de Puerto Peña."

conservator guards in the buildings, facilities and roads, two gardeners for the urbanization and conservation of the town, management and gardens, two drivers and a mechanic and assistant, a priest, a doctor and two teachers). The categories varied, from housing for auxiliary personnel to workmen. The largest group consisted of 14 units. Services included a health center/pharmacy (with a doctor, as it was in a zone where there was known to be malaria), chapel/school (for kindergarten), one-room school for older children, equipped for showing movies at night), washhouse, laboratory and garage with a small workshop for government vehicles. Lastly, it was not considered necessary to have a Guardia Civil post.

Figure 16. Map of the town with management area on the right. The zones available for contractor personnel were located left of the main part of town and on one of the sides of the square

As was the case in Zújar, the buildings were copied mostly from the Orellana project. This was the case with the site management building, general housing and even the laboratory and water treatment plant. At the same time, it includes own elements, such as a slightly different chapel/school, health center and school/theater.

The town was located 1.5 km downstream of the dam on the left bank. Its site was justified by being rather flat in a rough terrain, protected from summer heat, having easy water supply, and because the lands were expropriated very cheaply. The layout of the buildings differs from the Orellana and Zújar projects because of the rough terrain. The buildings were distributed on a hillside in two rows. In the area of the chapel and theater, which were close together, a slightly regular square was planned where the health center was also located. In the same square, a zone “available to contractor personnel” was planned, probably for the most important houses. Not in vain, the Government planned housing

for highest-category auxiliary personnel (doctor, teachers and priest) to be located in the square. The management area was on slightly higher terrain with views of the dam near the main area, comprising a group around a central square. Finally, we emphasize that the project included trees and bushes typical of the zone: germander, hawthorn, eucalyptus, pines, etc. Locations for trees, planters in the square, etc. were included in the layout.

At present, the town remains in good condition, and some houses are permanently occupied (Figures 17, 18). The position of the village was slightly modified, arranging it perpendicular to the road that ended in the square, flanked by buildings with small towers on the corners. This open space, although planned with an irregular layout, in the end was rectangular, closed in on its north side by the chapel, on a raised platform and aligned with the perpendicular axis. To the west of that axis, the hydroelectric operating company, Saltos del Guadiana, built a group of houses around another, larger square with a simple fountain in the center. The houses in this second group have two heights. The group is completed with other Government row houses, the laboratory and the garage.

Figure 17. Present day view of Puerto Peña. 1: Saltos del Guadiana square and buildings; 2: government town square with the church to the east; 3: management neighborhood

Figure 18. Top: government town square and street; mid: Saltos del Guadiana zone; bottom: church/school and manager's house

## **Analysis**

Some ideas can be extracted from this study of four towns. First, there are two very differentiated groups: the town of Cijara, planned before the Civil War, and the other three. The main differences derive from Cijara's plan as a complete town, for Government as well as contractor personnel. At first there was no church, because it was built during

the Republic; and third, there was no need of a patio foreseen in the housing design. In addition, a thermal power plant had to be built to provide electricity for it. It was also the only one with a Guardia Civil post, although one was originally planned in Zújar.

The other three towns are very similar in their construction, Zújar and García Sola copying housing, the administrator's house and sanitation and supply lines from Orellana. The differences are in single buildings, such as the health center or the chapel.

In general, at least two groups were differentiated. The main one with housing for personnel, chapel/school, etc., and another for management, with site management and administration building. Buildings such as laboratory or garage might be in either one.

One of the most surprising observations is that the building layout could be changed at construction with regard to the original plans. This happened in Orellana, Zújar and García Sola, where the types of buildings were usually the same, but their placement changed.

According to the theoretical planning of the towns (which as mentioned above, might change at construction), the buildings were intended to form a square where the chapel/school was the main building; furthermore, a space was reserved (one or two sides of the square) for the contractor's buildings, which would close off the square. In two of the squares planned and not built (Orellana and Zújar), housing was arranged with their façades facing outward, and the patios inward the square, perhaps to ensure the safety of children at play. However, in García Sola, the most important buildings (health center, auxiliary staff housing) were laid out around it, and the main façades looked over it. In Cijara, where there was neither church nor contractor buildings, tertiary services were planned around the square (barber, tobacco shop, cafeteria, etc.).

The main criteria for choosing the location of the main town were flat areas, protection from extreme temperatures, and location close to the dam or on land not being farmed. The management zone, however, was planned in a place where there was a view of the dam.

While it is not within the scope of this study to analyze the buildings, it may be observed that housing was classified by order of importance, and this was reflected in its appearance. The site management building was the most important, and therefore had two floors and galleries, etc. Next came the chief engineer's residence, which had a large and irregular layout and a pinnacle. In continuation, the two assistants', simpler than that of the engineer, but with two floors. After that, the auxiliary personnel, foremen and supervisors, and finally, the families. These were of three different types to provide variety. The concern for avoiding uniformity should be emphasized (except in Cijara). Thus, in García Sola, there are 29 houses, but the two most repeated types are only reproduced six times (Types C and D, Figure 16).

It was considered important for there to be spaces with trees and gardens. And so, it was planned for there to be one or two gardeners during the useful life of the town. Moreover, trees were drawn in some of the plans. Finally, the projects include the existence of additional personnel for forest repopulation, "including a small irrigation canal", or even the species to be planted<sup>39</sup>.

## **Conclusions**

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<sup>39</sup> López Sánchez, "Proyecto de Edificios Auxiliares Para La Administración En Las Obras Del Pantano Del Zújar"; Ponte, "Proyecto de Edificios Auxiliares Para La Administración Del Pantano de Orellana."

This study analyzes the four towns built by the Central administration next to the Cijara, Orellana, Zújar and García Sola dams to house the workers who worked on the site in the 1950s. The original projects have been studied, discussions have been held with some technicians of the Confederación Hidrográfica del Guadiana [Water Board] and visits have been made to the sites. The conclusions of the research are as follows:

Firstly, we believe that these company towns represent an important chapter in planned urbanization in 20th century Spain. They are associated with the Plan Badajoz and can be considered as miniature versions of the 60 towns promoted by the I.N.C. to house the settlers of the aforementioned plan. In this sense, we could establish a parallel with the case of Agro Pontino in Italy, where both cities of note and small *borgos* were built every few kilometres <sup>40</sup>.

In this sense, it should be noted that the small size of the dam villages did not prevent their programme from being the same as that of the colonisation villages: to provide the employees with water, sanitation, electricity, schools, medical and recreational facilities, church, etc. In other words, their small size did not prevent them from meeting the daily needs of education, leisure or religion. The villages are, moreover, contemporaries of some of the towns, and we therefore believe that the designers of the villages (usually the same engineers in charge of the design of the respective dams) were inspired by the villages: such matters as their design, repetitive elements, open spaces or the location of public buildings were often the same. Likewise, the villages - like the towns - are imbued

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<sup>40</sup> Martone, “Le Trasformazioni Territoriali Dell’area Pontina Nel XX Secolo. La

Riconoscibilità Storica Dei Luoghi Nella Iconografia Tra Ottocento e Novecento: Alcuni Esempi.”

with garden city ideals: ample green open space, separation of housing from commerce and local civic amenities within walking distance can be found here.

From the viewpoint of landscaping, the interest of these towns stems from having adapted well to the settings where they were located. They are small towns made up of one or two-story buildings, alternate models suggestively, are located adapting to the natural terrain, not imposing on it with heavy earthmoving, and respect uniformity with the traditional buildings in the area (whitewashed façades, stone mouldings, recessed models, etc.).

In relation to the layout, although it is true that there are not usually well-marked squares - except in the case of the first nucleus of Cijara and Puerto Peña -, areas were designed with a little more width, or esplanades in front of the main buildings, such as the churches. As for sunlight, some nuclei had the main façades of the houses facing south, as in the case of the second nucleus of Cijara, Orellana or the main squares of Puerto Peña; however, in other cases, such as Zújar, it does not seem that sunlight was very important when it came to choosing the location.

The main buildings in the settlements are the site management buildings. They are usually more formally complex than the houses or even the churches and therefore act as symbolic buildings, as was the case with castles in feudal Europe or the opera houses in the great cities of the 19th century; however, unlike in these cases, they are usually located in separate spaces. The symbolism of the buildings comes from the fact that they are representative buildings of the power of the public in the context of a political regime and also of the power of engineering, a social elite at the time, over the workers themselves and over the nature they aspire to domesticate.



In line with the previous paragraph, it is interesting to allude to the topographical location of the nuclei and the site management building, as well as their relationship with the dam and the other sheet of water. The villages of Cijara and Orellana are located upstream from the dam; however, only the village of Orellana has a view of the sheet of water. The rest of the villages, including the second village of Cijara, were located downstream of the dams. These settlements were usually located on a hillside, possibly to facilitate the supply of water by gravity. As far as the site management building is concerned, they were always located on a hill in order to have a good view of the dam; in some cases they were located upstream (Cijara, Zújar), and in others downstream (Puerto Peña, Orellana). We believe that the clear separation between settlements and the management area was also related to this aspect, and not only to the need to clearly mark some areas from others: the management needed the best possible place to observe, and the dwellings needed a place where it was easy to supply them with water.

Precisely, the water supply must have been one of the complications of these projects, given the difficulty of obtaining it in an area with little water and a climate that is certainly arid in summer. In this respect, and as has already been noted, the project data indicate that the water supply was 100 litres per person per day, which is less than what was already required for towns with more than 15,000 inhabitants in 1924 (200 litres per person per day).<sup>41</sup>, but at the same time it is the amount that the current law aims at as a minimum provision to cover the hygienic-sanitary needs of the population. This reinforces the idea that the settlements were designed to offer good living conditions for their workers, comparable to those existing in the rural world or even better. However, this conception of the settlement as a place that offered acceptable standards of quality is

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<sup>41</sup> Matés, “Water Supply Regulation in Spain: 19th and 20th Centuries.”

limited to settlements promoted by the state and electricity companies, as construction companies sometimes housed their workers in barracks.

With regard to these barracks, none of the settlements of this type have survived, although perhaps the materials with which they were erected would not have allowed them to be preserved to the present day. It remains for the future to carry out research to find out what these settlements were like and what facilities they offered their inhabitants, perhaps through oral sources and historical photographs.

However, it would be interesting to develop a research project that gathers the testimonies of people who lived in these settlements. For our part, we are initiating a research project consisting of interviews with people who lived in these villages of children who spent their childhood in these villages. The dams are still in service today.

Finally, it is worth mentioning the current situation of these villages. The towns, where during the years the dams were being built were places where several hundred people lived, have evolved differently since their completion. In general terms, we believe that these interventions can be considered as successful experiences from a social and economic point of view. The settlements fulfilled their purpose, not only during the construction phase, but also during the exploitation phase.

Despite the fact that nowadays large hydraulic works are no longer carried out in Spain, due to the high environmental impact they entail, it should be noted that the dams and canals of the Badajoz Plan are still operational today, providing water to irrigators and

using the surplus flow to continue producing electricity, an added value given that this is a renewable energy source.<sup>42</sup>

In some towns, the site management and other buildings continue to be used by the Guadiana Water Board either for servicing the dams or as leisure residences for its employees. However, most of the buildings are now empty. We therefore believe that although deteriorated, they represent places for opportunity. Recent actions, such as the rural tourism in the town of Aldeaduero (in the town built for the Saucelle dam), show the possibilities of some towns which are hardly in use today, and yet are aesthetically interesting and located in privileged spots along with large bodies of water, that still await their use for tourism<sup>43</sup>.

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<sup>42</sup> Martín Lobo, *El Plan Badajoz ¿éxito o Fracaso? - 50 Aniversario 1952-2002*.

<sup>43</sup> Plasencia-Lozano, “Alconétar, Paisaje Cultural de La Ingeniería. Una Propuesta de Ordenación Territorial.”

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