

# **Infrastructures and politics in Portugal in the first half of the 20th century: innovation in lighting and water supply**

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The building of water supply and lighting infrastructures - a fundamental factor in the urban modernisation process - was a common subject in Portuguese political rhetoric in the first half of the 20th century.

Given that during that time Portugal went from a liberal regime (the First Republic) to authoritarian rule (the New State), the aims of this paper are to:

- review the arguments, which were used by both regimes to appropriate the discourse on infrastructures;~
- identify the technical and technological options and the business models employed to build and manage the networks;
- establish the rate at which they were implemented.

The paper also attempts to fit the Portuguese case into the models and innovation processes followed in other countries.

Keywords: urban infrastructure; water supply, electricity; Portuguese politics.

## INTRODUCTION

From the second half of the 19th century an essential feature of the modernisation of cities was the construction of water-supply, power and sewer infrastructure networks, involving the use of processes, techniques and materials made available thanks to innovations in industrial production and the advance of knowledge in the field of science and engineering.

The decision to build these modern infrastructures derived from concern to raise standards of public hygiene, was influenced by the ideas of Cerdá and Haussmann regarding urban development; the main objective was to make cities more attractive places to live in, while at the same time resolving sanitary and safety problems resulting from the increasing numbers of people living in urban centres.

Many instruments designed for urban planning, the control of economic activity and public intervention in the life of cities had been developed during the period from the beginning of the 19<sup>th</sup> century up until the First World War in response to these challenges. Urban development then began to follow the ‘regulatory pattern, characterised by the growing importance of politico-administrative bodies in the construction of cities’<sup>1</sup>.

The technological complexity of the process of construction of water, gas, electric and sewer networks often meant that public intervention was necessary. The construction of underground water-supply networks, sewers, and gas and electricity networks required not only a high degree of technical competence for the handling of materials involved in such works, but also an expert knowledge of the topography and geology of sites and the planning of networks. Engineering expertise became an essential factor in the drawing up of plans and the execution of works<sup>2</sup>.

But state involvement in the construction of infrastructures was due not only to technological complexity of works but also to factors of a political, economic and legal nature as well as the relationships established between the different parties actively involved in the process. According to Dany Fougères, like other kinds of urban infrastructures, the provision of water to homes represents a *lieu d’arbitrage* between the social (aspects of a political, economic, legal nature, etc.) and the geo-technical (provision of water resources, durability of materials, technical knowledge, etc.)<sup>3</sup>.

The present study of the process of the construction and operation of modern water-supply and energy (for lighting) infrastructures in Portugal in the first half of the 20<sup>th</sup> century falls within the framework of the overall problem as set out above.

From the second half of the 19<sup>th</sup> century, some cities and towns in Portugal were able to benefit from the advantages these innovatory systems brought, but only in the first half of the 20<sup>th</sup> century did the presence of such infrastructures become generalised. Although it is therefore possible to identify distinct stages in the introduction of infrastructures, Portuguese historical studies have dealt with the theme largely from the perspective of case studies; therefore the synthesis that is presented in

this paper should be regarded as an initial study, which will provide the basis for further work<sup>4</sup>.

The present piece of research is based mainly on the socio-political aspects of the problem, in particular the production of legislation by means of which the Liberal Republic and the authoritarian New State systematised the arguments of their respective discourses on the construction of modern water-supply and lighting networks. This paper not only seeks to identify the technological and technical paths followed and the business decisions taken both in relation to the construction and operation of new infrastructures but also attempts to gauge the rate at which such networks were constructed.

It should be added that no attempt has been made to deal with the two largest cities in the country: Lisbon and Oporto. This approach is due, on the one hand, to the vast difference in terms of population between these and all other, much smaller, Portuguese cities, and at the same time to the awareness on the part of political leaders that their response to the diversity of urban contexts would necessarily involve a range of different solutions.

It should also be noted that a knowledge of the characteristics of the national urban network is essential for an understanding of the specificity of the process of the construction of modern urban infrastructures in Portugal. To summarize the situation, and simplify the picture somewhat, the contemporary Portuguese urban network is characterised by the existence of the metropolis of greater Lisbon, the second city of Oporto, and the lack of a significant number of medium-sized urban nuclei<sup>5</sup>. The influence this profile had on the process of the construction of modern water-supply and lighting networks is as evident in the arguments used by the authorities as in the solutions adopted for their construction and operation.

## I - THE LEGAL ARGUMENTS FOR CONSTRUCTING MODERN INFRASTRUCTURES

### A) IN THE REPUBLIC

Matters regarding lighting, water-supply and sanitation in urban centres figure among the main responsibilities assigned to local authorities and were systematised in the administrative codes introduced in Portugal following the establishment of the monarchical Liberalist government.

The last code of the monarchical period, which retained the discursive formulas of the previous administrative legislation, regarded as fundamental competencies and responsibilities of local councils the administration of the property and affairs of *concelhos* (districts), and the planning and implementation of measures for material improvement with a view to improving the quality of life of local people<sup>6</sup>.

The term ‘material improvement’ was applied, among other things, to the maintenance work and improvements to facilities and systems which traditionally provided local residents in urban centres with access to water and lighting, and it also covered studies and plans for infrastructures of this nature, drawn up in accordance with modern engineering concepts.

During this period, as far as public and private lighting is concerned, this meant recourse to new sources of energy such as gas and above all thermal or hydro-electric electricity; in the case of water-supply it meant the carrying out of periodic scientific analyses for quality control for domestic use, new sources of energy and machinery for the purposes of harnessing water at source, distribution and storage, and the construction of domestic supply networks for public and private consumption. Thus, the new standards of comfort and hygiene provided by the technological and scientific progress characteristic of industrial societies became generalised, and were much sought-after by the urban middle classes.

Whether to pursue a traditional policy of material improvement or opt for innovatory technical solutions was up to municipal councils. Such decisions depended, in the last analysis, on the knowledge and competencies of the elites who led council administrations and how far they were receptive to innovation. Case studies carried out for Portugal seem to point to a positive correlation between the pursuance of modernising policies and the presence of engineers who either worked for local authorities or frequented the same circles of sociability as the individuals who made up council teams.

Financing was necessary for construction projects and very often placed an insurmountable obstacle in the way of the implementation of modernising projects by local authorities in Portugal. Funding such investment projects derived from municipal income from council assets, taxes levied and bank loans contracted. As most district councils suffered from a chronic lack of funds, borrowing often assumed worrying proportions and led to burdens of debt payment that could threaten councils’ financial viability. The administrative code of 1896 sought to minimise this problem by placing

tighter controls on borrowing by local councils and increasing central government control over municipal authorities<sup>7</sup>.

The new code was criticised as aiming at excessive centralisation and representing an attack on the traditional autonomy of Portuguese municipalities. The Republicans used this argument in order to attack monarchical government departments and promised to introduce a more decentralised model of administration under a future Republican regime.

But the circumstances resulting from the increase in the number of people living in urban centres in Portugal led the State, as early as the period of the Liberal Monarchy, to introduce legislation designed to provide a legal framework for intervention aimed at improving conditions of sanitation and hygiene in the main cities and towns in the country.

The outbreak of bubonic plague which hit the city of Oporto in 1898 was instrumental in the setting up in 1901 of the *Conselho de Melhoramentos Sanitários* (Sanitary Improvement Council), under the *Direcção Geral das Obras Públicas e Minas* (Department of Public Works and Mines)<sup>8</sup>. The *Regulamento Geral de Saúde e Beneficência Pública* (General Regulations for Health and Public Welfare), aimed at providing a framework for local authority intervention in the field of public health, were also introduced in 1901<sup>9</sup>.

In 1903 a move was made to improve the habitability of urban buildings with the introduction of the *Regulamento de Salubridade das Edificações Urbanas* (Urban Buildings Health Regulations)<sup>10</sup>, which laid down guidelines to be followed in the construction of urban buildings. These stipulated not only that council licences for construction or rebuilding works should be subject to a prior approval by regional departments of the Sanitary Improvement Council but also made it compulsory for builders to comply with the provisions of the General Regulations for Health and Public Welfare.

In an attempt to gauge the situation on the ground in the main cities and towns of the country, in 1903 the government ordered a public health survey to be carried out in urban centres<sup>11</sup>.

The revolution of 5<sup>th</sup> October 1910 ushered in the Liberal Republic. Although Republican leaders intended to quickly draw up a new code, which faithfully reflected their ideas as regards administrative decentralisation, they ended up by maintaining in

force part of the code of 1896, while introducing certain new guidelines of a decentralising character in the administrative code of 1878.

As regards the question of material improvement, the most relevant aspects of these changes were the return to a greater degree of flexibility towards borrowing in order to finance public works and to less stringent control by central government.

The execution of studies and the drawing up of plans for the construction of modern urban water-supply and lighting infrastructures continued, therefore, as one of the main responsibilities assigned to local authorities and was still carried out on a casual basis.

Nevertheless, Republican decentralisation motives are present in the administrative legislation of 1913<sup>12</sup>, especially the provision for municipalities to form groups in order to carry out certain improvement works where the volume of investment was beyond individual councils' capabilities. There was also provision in the bill for endowing local authorities with the power to discuss the "*municipalização*, or local authority provision, of services to local people", but in the event this did not become law. Only in 1927, after the Municipal Congress of 1922 and the 3rd Electricity Congress of 1926, at both of which the need for councils to take charge of provision of services was reaffirmed, was this provision granted legal authority<sup>13</sup>. The regulations contained in the law stipulated that municipal services should be provided by departments retaining autonomy within the framework of local authority administration and that they should be managed by an administrative committee elected by the council. Each department responsible for providing municipal services should have a team of technical, administrative and manual staff to ensure the smooth administration of the system, planning and execution of works. Councils were also given specific powers to manage services and assets in the following areas: the construction and operation of water-supply systems for domestic consumption; cleaning, sanitation and public sewers, including the removal or use of urban waste; the production and distribution of gas and electricity; the construction and operation of markets, abattoirs and refrigerators; the construction and operation of public baths and washing-sites; the construction and operation of means of transport; and any other services involving the production or distribution of goods or the provision of services aimed at satisfying the needs and interests of local people. At the same time, there was a provision to the effect that when a need for the operation or development of certain services required loans to

be contracted, the municipal services administrative committee should not only justify the need for borrowing but also guarantee to fulfil the terms of repayment.

The law of 7th August 1913 also enabled local councils to form federations in order to jointly administrate one or more types of public utility. Given that setting up departments to provide urban infrastructures required a huge financial investment, the purpose of this measure was to ensure the best use of such investment by councils. In fact, the concern of the government to encourage the provision of municipal services led to the gradual introduction of a series of laws during the subsequent period. In order to promote the carrying out of works for the construction of electricity networks, councils were granted favourable terms of payment on import duties levied on essential materials for lighting installation works<sup>14</sup>. Also councils, which directly operated and were fully financially responsible for providing public lighting and traction services and supplying water, gas and electric lighting and energy to private consumers, were granted exemption from *contribuição industrial* tax<sup>15</sup>. In 1920, with a view to encouraging municipalities to start providing lighting and supplying water to residences, the government exempted them from import duties on all imported materials required for the construction of municipal lighting and water-supply networks and simplified the legal procedures for carrying out compulsory purchase orders essential for the construction of electric and water-supply networks<sup>16</sup>.

These measures had an almost immediate impact by setting in motion council initiatives both to invite tenders for the supply of electricity for lighting and to bring services, which were already offered by the private sector under municipal control. By 1927 it was recognized that there was a significant degree of municipal involvement in the provision of certain public utilities in the country as a whole<sup>17</sup>, although only around 15% of councils had public utilities municipalized.

A clear example of the influence of the administrative decentralisation ideas dear to the Republicans is provided by the ‘municipalist’ movement of the early 20th century, which held congresses all over the country. Seen as championing the cause of the liberty enjoyed by the districts in the past, the movement advocated the free association of municipalities and the formation of a federation with the aim of strengthening local power.

For example, at the Alentejo Municipalities Congress held in 1915, those attending backed the modernisation of Alentejo municipalities for the “development of the Alentejo” by pushing for increased autonomy with regard to taxes, infrastructures,

economic activity, the spread of farming techniques and assistance, culminating in the setting up of a *Federação de Municípios Alentejanos* (Federation of Alentejo Municipalities) which would lead to the establishment of a provincial parliament for the “discussion and deliberation of matters which were of interest to the Alentejo”<sup>18</sup>. However, such proposals were never put into practice either in the Alentejo or in any other region, although they did faithfully reflect the plan for administrative decentralisation put forward by the Republicans.

In order for plans for federations of municipalities and provincial parliaments to be carried out, a sea-change was needed in the model of local authority administration which had existed in Portugal for around a century<sup>19</sup>. But the Great War forced the Portuguese Republican regime to concentrate on the management of the political and military stance of the country with regard to the conflict and the resolution of economic and social problems brought by the war. After 1918, there was increasing political instability and critics of the regime gained ground.

## B) IN THE NEW STATE

In 1926, a civilian-backed military coup installed the Military Dictatorship, thereby putting an end to the Parliamentary Republic.

At the administrative level, this situation removed any possibility of achieving the decentralising aims of Liberal Republicanism, even more so as the years passed. António de Oliveira Salazar emerged on the Portuguese political scene in 1928, and was responsible for shaping the development of the country over a period of several decades; in 1933, under his direction, a repressive dictatorial political regime was established which was known as the *Estado Novo* (New State).

District councils became vehicles for the implementation at the local level of government policy, which prejudiced their status as municipal administrative bodies representing the interests of local people in the districts, for which purpose they had been elected. The administrative code of the New State, which became law in 1936, served to confirm the subsidiary role of local authorities<sup>20</sup>.

From the beginning of the 1930s the State was concerned not only to bring economic activity as a whole within the legal framework but also, and increasingly evidently, to follow a policy of state direction and control<sup>21</sup>.



The economic and social effects of the crisis of 1929 facilitated this stance. From at least 1931<sup>22</sup> the government sought to officially gauge unemployment in Portugal, and in 1932 legislation was introduced which made a concerted effort towards resolving the problem<sup>23</sup>. In the first quarter of that year the *Alta Comissão para Melhoramentos Públicos* (High Commission for Public Improvements) was set up under the Ministries of Finance, Commerce and Communications, and Agriculture and the government took measures for the exceptional provision of funds for public works. Some were targeted at the so-called rural improvements and were to be distributed to almost all parishes and districts in the country; while funds were also channelled into the “great cities” with a view to launching and implementing public works considered to be “of the greatest social utility”, such as council housing estates in Lisbon, further education colleges, a hospital in Oporto and a lunatic asylum in Coimbra.

In July of the same year, Salazar assumed the office of president, the first civilian to occupy the post since the military coup of 1926. Two days later the Ministry of Public Works and Communications was set up replacing the Ministry of Commerce and Communications. The symbolism of this change was evident: the legacy of the Liberal republic was banished and at the same time the designation of the old Ministry of Public Works, Commerce and Industry, which the national collective memory associated with the intentional policy of material improvement carried out by the monarchical regime in the second half of the 19th century, was revived. Funds earmarked for unemployment benefit were channelled into the new ministry and a stage of the New State was initiated in which public works programmes gained in importance and visibility<sup>24</sup>.

Also on 19th September 1932, several laws were passed which together established the legal framework for the policy of material improvement and created the mechanism for State direction of the process as a whole. Each law dealt with a different area of actuation and defined the role to be played by central government and determined what kind of control it would exercise in each area<sup>25</sup>.

*Rural improvements* were defined as works to be carried out at the local level outside urban centres and district capitals, such as: highways, local tracks, road surfaces, fountains, water-tanks and washing-sites. Although the government considered that such works “could involve a degree of decentralisation by means of cooperation with local authorities”, it added that in local councils “could only achieve greater efficiency through technical centralisation”. This role was entrusted to the *Junta*

*Autónoma de Estradas* (Autonomous Highways Board), made responsible for assessing and approving plans presented annually by local authorities. On the basis of these plans the Ministry of Public Works would provide funding to a maximum of fifty percent of the total cost of works, while councils would have to find the remainder.

*Urban improvements* were defined as those “which brought the greatest benefit in terms of the welfare of people living in medium-sized and small towns”, which the government, “as coordinator and director of all the activities of the nation sought to carry out on a general scale in order to foster the development of villages, towns and cities in the country”. Works regarded as urban improvements were “those of interest at the local level which would benefit the community, carried out outside large population centres, including the drawing up of urban development plans, the construction, repair and remodelling of primary schools, elementary professional schools, municipal secondary schools, hospitals and other buildings with a social role, museums and national monuments”. Carrying out such improvements required the drawing up of “a general plan whereby State aid to local people, either by direct means or through intermediaries such as state departments and local authorities, might ensure that such improvements are executed in accordance with effective guidelines”. The Department of Buildings and National Monuments was charged with providing technical guidance and inspection services and conducting surveys in order to assess local needs, while the Ministry of Public Works was assigned responsibility for the distribution of funds and overall control of procedures, and there was provision for the sharing of the burden of investment between the State and local authorities.

*Improvements to water-works and sewers* were defined as “works to harness at source and distribute water and the construction, improvement and extension of sewer networks in towns and important settlements and in cities, except in large urban centres”. The “very valuable contribution” made by local authorities in this field was acknowledged and “the huge dimension of the problem” was recognized, while the bill made it clear that “the State had a duty to facilitate the mission of these bodies and ensure that it was carried out”.

The Department of Health was given five months in which to carry out a survey of “district capitals, main towns in districts and other important towns and villages in each district, providing details of the potential of each type of public service and the weaknesses identified in services in operation that should be remedied, highlighting the most urgent cases in each *concelho* (district) and *distrito* (county)”. Once the results

had been obtained, the government would be responsible for drawing up a programme of improvements to be carried out by councils, and ordering, through the competent departments, the execution of studies and the drawing up of plans. The *Administração Geral dos Serviços Hidráulicos e Eléctricos* (Department of Hydraulic and Electric Works), under the Ministry of the Public Works, could authorize local authorities whenever it deemed necessary to contract out the execution of studies and plans to third parties with technical expertise. The law also provided for the programme of improvements to be reviewed every three years to take account of the results of new surveys; the Department of Hydraulic and Electric Works would submit a report on the plan of works to be carried out by district councils by 31st March of each year and, having been approved by the *Conselho Superior de Higiene e Obras Públicas* (Council for Hygiene and Public Works), plans would be submitted for approval by the Ministry of Public works. The cost of these improvements was to be borne by municipal councils, except where this was recognized as being impracticable, in which case the State would share the cost of investment up to a maximum of fifty percent of the cost of works. Specific provision was also made for county councils, committees responsible for proposing plans and private individuals to be able to carry out improvements on their own account, with the technical assistance of the State, provided that such works had the prior approval of the Department of Hydraulic and Electric Works and were included in the plan of works approved by the government.

Also on 19<sup>th</sup> September 1932, in order to combat the employment crisis affecting the country, the government set up the *Comissariado de Desemprego* (Unemployment Commissariat), with departments in each county. This was a department of the Ministry of Public Works, although its operations and administration were autonomous. Its main aims were to organise the registering of the unemployed, help unemployed people to find work and administrate the system of unemployment benefit. Among works which would most profitably benefit from the harnessing of this source of labour, the government regarded “rural improvement works, urban improvement works, water and sanitation works, the cleaning of ditches and verges, tree-planting, and so on.” Among works to be carried out in order to relieve unemployment, the law classified water-supply and sanitation infrastructures as complex works requiring a great degree of technical skill and therefore those which “will take a considerable time to become fully operational over extensive areas, although due to their great value in terms of bringing improvements in urban hygiene,

they are works whose execution is most necessary”; the close relationship between the rate of execution of sanitation works and the decrease in death rates is evident here.

Taken together, these laws represented a blueprint for concerted intervention by the government in the field of public works and identified the New State with the values of modernisation and material progress. The improvement programme thus involved a discourse that, by valuing ‘work accomplished’, aimed at legitimising the authoritarian regime and portraying the Liberal Republic as a period of anarchy and political uncertainty.

In addition, in late 1934 a law was passed requiring all towns and cities which were district capitals to draw up topographical plans and urban development plans for settlements with a population of over 2,500 with a high rate of demographic growth and for centres or zones with interest of a tourist, recreational, climatic, therapeutic, spiritual, historical or artistic nature, as designated by the government<sup>26</sup>.

As justification for this compulsory requirement, the government cited a combination of “the benefit of social assistance through providing work” to local people who needed it with the fact that district councils requested “the intervention of the government” for plans which were not always “drawn up according to the best criteria and the fairest consideration of local conditions and future needs, or in compliance with the best standards of hygiene and convenience for urban settlements.” It also referred to the frequent lack of “technical staff with specialised knowledge of the modern art of urban planning, which is also a science”.

The drawing up of topographical plans, with the exception of those of Lisbon and Oporto, was offered for public tender, based on criteria established by the government, which was also responsible for the overall direction and inspection of works. However, councils were expected to reimburse the State in instalments for expenses incurred. The law also provided councils with a three-year deadline following the drawing up of topographical plans to present their individual urban development plans, which for government approval had to be granted following the issue of a certificate by one of the *Conselhos Superiores de Obras Públicas, de Higiene e Turismo* (Higher Councils of Public Works, Hygiene and Tourism). Among the compulsory requirements for urban development plans were schematic plans of existing water-supply and public lighting networks, water-drainage systems and sewer systems, along with a statement of what was required to be done in this field. In theory, the new

legislation provided for new zones of growth and expansion of urban centres to be endowed with modern lighting, water-supply and sanitation infrastructures.

All the legislation examined above shows an aim on the part of the political leaders of the New State to restrict the scope of local authority initiative in the field of infrastructures and urban facilities by means of instruments of control such as guidelines, technical inspection and the financial control of plans. In certain cases, the Ministry of the Public Works, through central departments and/or regional and other departments, itself directed works.

In fact, the intervention of the government in these areas was based on a broader aim than that which was contained in the provisions of the law of 1933, which was approved by the *Estatuto do Trabalho Nacional* (National Work Statute). The law stated that “the State has the right and the obligation to coordinate and regulate from above the economic and social sphere and set objectives for it”<sup>27</sup>.

In accordance with this guideline the *Lei de Reconstituição Económica* (Law of Economic Reconstitution) was introduced in 1935, providing for “plans and works for whose execution there is a pressing need over the next fifteen years”, and earmarking substantial funds, considered as extraordinary expenditure<sup>28</sup>. Resources deriving from the success of financial and monetary stabilisation policy carried out in previous years would be channelled into the modernisation of the Armed Forces and the improvement and/or construction of basic infrastructures for the economic development of the country. Areas identified for investment were: roads, railways, ports, airports, telegraph and telephone systems, electrification, agricultural hydraulics, roads, public buildings and monuments and a range of other urban facilities in Lisbon and Oporto, as well as colonial credit.

In view of the ambitious nature of such proposals, when the bill was debated in parliament, the government made it clear that it did not seek to follow the development policy pursued in Portugal between the 1850s and 1880s, neither had it any affinity with the socialist planning model<sup>29</sup>.

However, when extensive legislation was introduced in 1944 dealing with the question of water-supply and sanitation, the State decreed that the construction of drinking water and sewer networks in district capitals in continental Portugal was a *mandatory issue and a question of priority*, overriding all others<sup>30</sup>.

In the preamble to the law, a brief outline was given of the development of the country as regards improvement works, highlighting the “extremely grave situation” in

which the nation found itself. And although from 1932 it was pointed out that the State had taken measures “of the utmost importance” for the sanitary state of the country, it was evident that there was still much to be done. As such works were of great complexity, and carrying them out was not mandatory by law, many local authorities had decided to build monuments or carry out urban development works instead of executing works to construct water-supply and sanitation systems.

For this reason, while declaring that it could not resolve the problem with a single programme, the government proposed to provide drinking water to all towns and cities which were district capitals by carrying out a plan over a ten-year period: a joint action involving the State and the municipal councils, although with a “completely new feature: the mandatory character of the execution of such improvements”.

From the technical point of view, it was decided that local councils would continue to be responsible for carrying out studies and executing works, although there was provision for the State to take the initiative for construction projects and/or intervene in operations to carry out works in certain cases. Works would be executed in accordance with an annual execution plan drawn up by the Ministry of Public Works and Communications and approved by the Ministers of Public Works and the Interior. The Department of Hydraulic Works would be responsible for organising the tendering of contracts for studies and plans to be carried out annually.

The financial feasibility of the undertaking was assured in the following way: councils were given the power to contract loans up to the value of fifty percent of the total cost of works, and offered favourable conditions of repayment, while in order to safeguard the councils’ regular income loans were to be guaranteed by income from the sale of water; to cover the remaining investment cost a subsidy of a minimum of twenty-five percent of the total debt burden was to be provided by the Unemployment Benefit Fund, and a central government subsidy would also be provided, if required, “out of its general income”.

As regards the operation of services, councils were given the choice of awarding contracts to sub-contractors or operating services themselves. Only in exceptional cases, where council income was too low to allow for either of these options did the State authorize the direct management of services by councils themselves. Thus an attempt was made to remedy situations in which the lack of sufficient income for the use of the new infrastructures might jeopardise municipal spending.

The law of 1944 shows clearly that the intention of the State was to control the process of the building of modern water-supply and sanitation infrastructures while recognizing that in the mid-20th century the situation of Portugal in this field still left a lot to be desired. While based on ideological grounds, this command approach was also the result of the recognized incapacity of municipalities to satisfactorily meet needs for the improvement of standards of hygiene, health and comfort for people living in towns and cities around the country.

## II - ACHIEVEMENTS

An assessment of the achievements as regards the construction of water-supply and lighting networks in Portuguese towns and cities is complicated by the absence of statistics dealing with these matters before the 1930s. As far as electric lighting is concerned, the compilation of statistics dates from 1928 and the first systematic survey of the nationwide situation in relation to water-supply was conducted in the early 1930s; this initiative was prompted by a desire on the part of the government to find out the current state of the system of water-supply and sanitation in the country following the legislation of September 1932.

One may speculate that conducting such surveys was not regarded as a matter of priority as central government for many years regarded the creation of these urban infrastructures as the responsibility of local authorities. Even if there is some truth in this, this scenario resulted above all from the difficulties central government encountered in endowing local authorities with efficacious means for obtaining the necessary information<sup>31</sup>.

In any case, the summary which follows is the best possible description that can be produced for the time being of an important stage in the process of the modernisation of Portuguese urban centres, in particular in the field of water-supply and lighting infrastructures.

Two distinct paths were followed by municipal authorities in the creation of electricity networks<sup>32</sup>. In some cases councils played a limited role, awarding contracts to sub-contractors for the public service distribution of electricity, the rights to which they sold to private organisations in return for an annual payment, the terms of which was set out in the contract<sup>33</sup>. In such situations, although local authorities had the power

to grant such rights, approval was required by central government and the conditions under which councils could do this were regulated by a range of legislative measures<sup>34</sup>. In other cases municipalities were directly involved in the setting up and operation of electric energy production and distribution plants.

From end of the 19th century some cities, such as Vila Real, Braga and Lisbon, had decided to adopt electric public lighting. In the early 20th century other cities followed their example, although in several towns the electricity option was complicated by the existence of contracts previously signed with gas companies for the supply of gas for public lighting. For electricity companies, investing in the provision of energy merely for the private consumption was risky as there was no guarantee that large numbers of people would decide to become domestic consumers. Thus, only a few electricity-producing companies were set up in urban centres where contracts for the provision of public lighting had already been signed. In Évora, for example, although in 1905 a company was set up to supply electricity to private consumers only, it constantly struggled to obtain the public lighting contract, and finally succeeded in doing this in 1917.

Throughout the 1920s there were various developments in the process of awarding contracts to sub-contractors for the distribution of electricity, although many did not come to immediate fruition. One of the first regionally-based companies to produce hydro-electric energy, União Eléctrica Nacional, founded in 1919, which operated a power station in the Douro region<sup>35</sup>, supplied several towns in the region.

During the period of the Dictatorship, the policy of centralisation was also applied to the supply of electricity, although technical aspects were a determining factor here. The harnessing of hydro-electric energy was only feasible if it served more than one municipality, and for this reason, in 1927, legislation was introduced enabling the government to take the initiative whenever it deemed necessary for fostering the formation of regional collective organisations for the construction or operation of one or more grids for the distribution of electric power which might come to form part of the national electricity network<sup>36</sup>.

By 1934, around 75% of district capitals had electricity for private and public lighting, and in 51% of cases municipalities operated this service. This does not mean, however, that all towns were covered by the electricity distribution network, and much less that this applied to the various urban centres in each district. Besides this, in urban



centres which benefited from electric lighting, the level of private consumption was extremely low: much lower than the average level of consumption for Europe.

The private consumption of electricity only began to rise when the so-called ‘regressive charges’ were introduced, and these were only used to a significant degree at the European level from the 1930s. The 5<sup>th</sup> Congress of the International Union of Producers and Distributors of Electric Energy, UNIPEDE, held in 1934 in Zurich and Lausanne, doubtless contributed to the adoption of such pricing policies. The engineer, Ferreira Dias, who attended the congress as the official Portuguese representative, affirmed that at the meeting “without concealing its doubts and reticence as regards the novelty of such pricing (which has still not disappeared completely), the organisation accepted the new pricing system”<sup>37</sup>. In Portugal, *European pricing* (graded charging for different types of use) was only introduced in 1937.

The putting in place of modern infrastructures for the harnessing of water at source and distribution advanced at a snail’s pace. The information available, based on the above-mentioned survey of 1934, covers all towns and cities in continental Portugal which were district capitals, with the exception of the cities of Lisbon and Oporto; the authorities decided that separate surveys should be carried out for these distinct cases. The results of the survey enable a distinction to be made between the harnessing at source and supply of drinking water to public access points in urban centres, and the construction of water distribution networks to public supply points and to homes.

The former involved quite extensive improvement works, both to collection points and pipes for carrying water to consumer areas, where public springs and fountains were built. In many cases, existing facilities already existed to meet the needs of the growing population of the urban centres they served. In other cases, works were required to allow water to be carried from places some distance away from towns and cities, and recourse to the latest techniques and technology was required in order to negotiate natural obstacles.

The survey covered two hundred and seventy district capitals, with the following breakdown in terms of the resident population: 75% of these towns and cities had fewer than 5,000 inhabitants; 16% had more than 5,000; 7% had more than 10,000; and only 2% had a population of over 20,000.

That is, around three quarters of settlements surveyed had populations that were below the quantitative threshold for designation as urban centres. However, from the

administrative point of view they were all district capitals, and as such they were the district administrative and political power base.

The characteristics of the Portuguese urban network placed limits on the construction of modern networks for harnessing water at source and supplying it. Firstly, the small size of the majority of population centres restricted municipalities' capacity for generating income and forced them to borrow money to finance expensive investment projects. Moreover, private investors, and companies looking to construct and operate such infrastructures were less likely to be interested in small towns and cities given the importance of the economies of scale required to make such enterprises profitable.

In settlements with up to 10,000 inhabitants, more than 50% of water sources were located less than a kilometre from the urban centre in question. The survey results show that in many cases water was sourced within or just outside the boundaries of the district. Such sources included springs, wells, artesian wells and rivers, in which case relatively simple works and plumbing arrangements were sufficient to provide local people with access to water. In urban centres with a large population, water sources tended to be located further away. In towns and cities with a population of over 10,000 inhabitants, approximately 17% of sources were located more than 5 km away from settlements, and in centres with over 20,000 inhabitants the percentage was around 33%. In such cases works to harness water at source were complex and involved a considerable investment. It should also be noted that in 45% of the total number of cases surveyed the rate of flow of water at source was unknown, and for others it was considered insufficient for consumption needs. Thus the conclusion can be drawn that the situation in which the country found itself with regard to infrastructures for harnessing water at source was still very backward in the mid-1930s and this certainly restricted the opportunities for constructing or extending water distribution networks.

Of the two hundred and seventy district capitals surveyed, only 36% had domestic water supply distribution networks in place. And in these cases, it should be noted that only a very small proportion of local people enjoyed the benefits of the system: in around 15% of settlements water was only piped to public springs and fountains, and for 48% of settlements there is no mention of the existence of a distribution network. Access to water for the overwhelming majority of people living in the urban nuclei surveyed meant getting supplies from public or private wells, springs

and fountains and using the services of water-carriers, wherever household incomes allowed.

By examining the number of cases in which water is specifically mentioned as being distributed to public supply points an assessment can be made of the rate of construction of distribution networks. It is evident that the process accelerated during the 1920s and 1930s: around 16% of networks had been constructed before 1900 or were classified as ‘old’; in the first decade of the 20<sup>th</sup> century about 4% of the total of networks which can be dated were built; in the 1920s, 10% were put in place; and in the following fifteen years leading up to the date of the survey 53% of networks were built. In fact, 50% of water-supply networks whose construction can be dated were built between 1926 and 1934, a period which coincides with the beginning of the Dictatorship and the initial years of the New State.

## CONCLUSION

As has already been mentioned, the first half of the 20th century was marked by a series of legislative measures which sought to establish the legal framework required for the creation of urban infrastructures in cities, towns and villages around the country. Although legislation providing for improvements and the development of the country promulgated during the period was part of the rhetoric of propaganda and the legitimisation of the authoritarian regime, there is no doubt that progress was made as far as the construction of modern water-supply and electricity infrastructures is concerned. The improvement of the state of Portuguese public finances is partly responsible for this, as well as the replacement of a policy aimed at establishing the framework for such works to be carried out by a command approach which conferred on the state a central role in the process.

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<sup>1</sup> cf. SILVA, Álvaro Ferreira da (1994), “Modos de regulação da cidade: a mão invisível na expansão urbana”, *Penélope* 13, (1994), pp. 121-146 and also SILVA, Álvaro Ferreira da (1997), “Crescimento Urbano, Regulação e Oportunidades Empresariais: a Construção Residencial em Lisboa, 1860-1930”, Florença, Instituto Universitário Europeu, pp. 213–248 (PhD thesis, photocopied).

<sup>2</sup> Idem.

<sup>3</sup> FOUGÈRES, Dany (1998), “Une approche socio-technique pour l’étude historique des infrastructures et des services urbains: l’exemple du service d’eau à Montréal”, CAPEL, Horacio and LINTEAU, Paul-André (eds.), *Barcelona -Montréal. Desarrollo urbano Comparado*, Barcelona: UB, pp. 202-203.

<sup>4</sup> In November 1998, the annual meeting of the *Associação Portuguesa de História Económica e Social* held in Lisbon was dedicated to the theme of *Urbanismo e Infra-estruturas Urbanas* (Urban Development Planning and Urban Infrastructures). Some of the papers presented were later published in the review *Análise Social*, Vol. XXXV (156), Lisbon, 2000. Also in 2000, in Oeiras, Portugal, a meeting was held on the theme of *Cidade e Metrópole: centralidades e marginalidades* (The City and the Metropolis: Central and Marginal Features), and the proceedings were later published in PINHEIRO, Magda, BAPTISTA, Luís and VAZ, Maria João (eds.) (2001), *Cidade e Metrópole Centralidades e Marginalidades*, Oeiras: Celta.

<sup>5</sup> Although the lack of data for the period examined in this paper makes it difficult both to ascertain the exact number of people living in urban centres and draw a clear distinction between the urban and rural populations in Portugal, the following studies support the picture of the national urban network presented in this paper. cf. VIEIRA, António Lopes (1978) “Noções operatórias sobre cidade, população urbana e população rural”, *Revista de História Económica e Social*, (1), pp. 116-122; SALGUEIRO, Teresa Barata (1992), “A Cidade em Portugal uma Geografia urbana”, Porto: Afrontamento, p.428; BAPTISTA, Luís and RODRIGUES, Teresa (1996), “Population and urban density: Lisbon in the 19th and 20th centuries”, *Urban Dominance and Labour Market Differentiation of a European Capital City. Lisbon 1890-1990*; PEREIRA, Pedro Telhado and MATA, Maria Eugénia (eds.), London: Kluwer Academic Publishers, pp. 59-61; and RODRIGUES, Teresa and PINTO, Maria Luis Rocha (1996), “O Crescimento Urbano no Portugal Oitocentista”, *População e Sociedade*, (2), p. 138-145 and SILVA, José Álvaro Ferreira da (1997), “Crescimento Urbano, Regulação e Oportunidades Empresariais: a Construção Residencial em Lisboa, 1860-1930”, Florença: Instituto Universitário Europeu, pp. 45–92 (PhD thesis, photocopied).

<sup>6</sup> cf. *Código Administrativo de 1896*, (1925), Lisbon: Imprensa da Universidades, pp. 23-29.

<sup>7</sup> For a more detailed view of the fields covered and the effects of Portuguese administrative legislation produced throughout the 1890s, among which is the *Código Administrativo* of 1896, cf. SERRA, João Bonifácio (1988), “As reformas da administração local de 1872 a 1910”, *Análise Social*, Vol. XXIV (103-104), pp. 1037–1066.

<sup>8</sup> *Decreto* of 24/10/1901.

<sup>9</sup> Authorised by *Carta de lei* of 24/6/1901 and dated 24/12/1901.

<sup>10</sup> *Decreto* of 14/2/1903.

<sup>11</sup> MONTENEGRO, Augusto Pinto de Miranda (1903), “Inquérito de salubridade das povoações mais importantes de Portugal”, Lisboa: Imprensa Nacional.

<sup>12</sup> *Lei* n.º. 88 of 7 August 1913.

<sup>13</sup> *Decreto* no. 13.350, of 25 March 1927. The regulations provided for in this law came into force on 27 July of the same year.

<sup>14</sup> *Lei* n.º. 183 of 4 June 1914, provided for an extended period (ten years) for the payment of import tariffs on the importation of electrical goods.

<sup>15</sup> *Lei* n.º. 409 of 9 September 1915.

<sup>16</sup> *Decreto-lei* n.º. 1.789 of 29 June 1925.

<sup>17</sup> *Decreto* n.º. 13.350 of 25 March 1927.

<sup>18</sup> BERNARDO, Maria Ana (2000), “Elites, acção pública e infra-estruturas em Évora (1890-1933)”, *Colóquio O Século XX em Évora*, Évora: Universidade de Évora.

<sup>19</sup> With the advent of the Liberal Monarchy (1820) and the administrative reforms which followed, a system of state local authority administration was established in Portugal which was based on the French system. While the pattern established at the beginning of the Liberal period was subject to changes wrought throughout the 19th century, the influence referred to was always present. For more detailed information on the legal framework and the working of administrative bodies from the Liberal period to the New State cf. CAETANO, Marcello (1935), “A codificação Administrativa em Portugal (um século de experiência: 1836–1935)”, *Separata da Revista da Faculdade de Direito*, Lisboa; SERRA, João Bonifácio (1988), “As reformas da administração local de 1872 a 1910”, *Análise Social*, Vol. XXIV (103-104); MANIQUE, António Pedro (1989), “Mouzinho da Silveira: Liberalismo e Administração

Pública”, Lisboa; OLIVEIRA, César (dir.) (1996), “História dos Municípios e do Poder Local”, Lisboa: Temas e Debates; SILVEIRA, Luís Nuno Espinha da (1997), “Território e Poder. Nas origens do Estado Contemporâneo em Portugal”, Cascais: Patrimónia Histórica; SERRA, João Bonifácio (1997), “O Estado liberal e os municípios (finais do século XIX a primeiro quartel do século XX)” (*SILVEIRA, Luís Nuno Espinha da Silveira (coord.) (1997), “Poder Central Poder Regional Poder Local uma Perspectiva Histórica”, Lisboa: Cosmos.*

<sup>20</sup> cf. works cited in the previous note.

<sup>21</sup> ROSAS, Fernando (1986), *O Estado Novo nos Anos Trinta 1928-1938*, Lisboa: Estampa, pp. 254-283.

<sup>22</sup> *Decreto* nº. 20.222 of 15 August 1931.

<sup>23</sup> *Decretos* nºs. 20.979 and 20.980 of 7 March 1932.

<sup>24</sup> ROSAS, Fernando and BRITO, J. M. Brandão de (dir.) (1996), *Dicionário de História do Estado Novo*, Lisboa: Bertrand, pp. 585-598.

<sup>25</sup> *Decretos* nºs. 21.696, 21.697, 21.698 and 21.699, all passed on 19 September 1932.

<sup>26</sup> *Decreto-lei* nº. 24.802 of 21 December 1934.

<sup>27</sup> *Decreto-lei* nº. 23.048 of 23 September 1933.

<sup>28</sup> *Lei* nº. 1.914 of 24 May 1935.

<sup>29</sup> ROSAS, Fernando and BRITO, J. M. Brandão de (dir.) (1996), *Dicionário de História do Estado Novo*, Lisbon: Bertrand, pp. 512-513.

<sup>30</sup> *Decreto-lei* nº. 33.863 of 15 August 1944.

<sup>31</sup> SOUSA, Fernando de (1995), *História da Estatística em Portugal*, Lisbon: Instituto Nacional de Estatística, pp. 250-253.

<sup>32</sup> Cf FERREIRA, Jaime Alberto do Couto e FIGUEIRA, João José Monteiro (2201), *A electrificação do centro de Portugal no século XX*, s/l: EDP Distribuição -. Energia Sa, pp. 20-24.

<sup>33</sup> Contracts having been signed, in order to ensure that standards of service were maintained, district councils, as inspectors, then enforced compliance with the various contractual clauses.

<sup>34</sup> In 1912 the *Regulamento das concessões de licenças para o estabelecimento e exploração de instalações eléctricas* (Regulations for the Granting of Licences for the Establishment and Operation of Electric Power Stations) were introduced with *Decreto* of 30 November 1912 and remained in force until 1936. *Decreto* nº. 26.852, of 30 July was aimed at providing a framework for the distribution of electrical energy networks created by local authorities themselves or operated by them. The terms with which proposals presented should comply were also set out in this document, issued by the *Administração Geral dos Correios e Telégrafos* (General Posts and Telegraphs Administration), the body responsible for issuing electric licences, which published the *Caderno de encargos-tipo das concessões a dar por um corpo administrativo para a distribuição de energia eléctrica aos serviços públicos* (Specifications for Granting of Licences for Electric Energy Distribution Systems by Local Authorities). On 30 April 1923, this law was repealed and replaced by new specifications for the granting of licences, by one or more local authorities, for the public distribution of electric energy” (*Decreto* nº. 8.788); specification was required of the purpose for which the licence was to be granted, whether the service was considered as being in the public interest, what prices were to be charged for different types of consumer (private consumers, public utilities, benevolent societies, educational establishments, or others) and what the conditions were for supply to private consumers and the extension of the distribution network, etc. 5 June 1928 saw the introduction of new Specifications for the Granting of Licences for Electric Energy Distribution Systems by Local Authorities (*Decreto* nº. 15.548), which replaced the earlier specifications.

<sup>35</sup> Owned by the Empresa Electra del Lima Company.

<sup>36</sup> *Decreto* nº. 14.772, of 22 December 1927.

<sup>37</sup> DIAS, J. N. Ferreira, (1998), *Linha de Rumo I e II e outros escritos económicos 1926-1962*, Tomo II, Lisbon: Banco de Portugal, p. 207.