

## **The history of water management in Italy: The case of Apulia**

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### **Abstract**

This paper reconstructs the time-frames and ways through which public policy in Apulia has, over the last two centuries, attempted to reclaim the land in order to quench the populations' thirst and irrigate the fields. The aim is to analyse the distribution and the intertwining of territorial powers called upon to govern water resources in Apulia during the 19<sup>th</sup> and 20<sup>th</sup> centuries. The article examines the two main forms of intervention adopted: (i) the construction of complex systems of water projects to transport water from neighbouring regions to this region; (ii) the search for and exploitation of groundwater, either by public authorities or by the population. It highlights the conflicts of jurisdiction between the different protagonists in the territory, and the careless abuse of groundwater, through the increasing use of boring. It finally invokes the need for a comprehensive approach to the different uses of water and to an integrated water system on a suitable territorial basis.

### **Keywords**

Water management, Public policies, Environmental constraints, Sustainable use of water resources

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## Introduction

The study of contemporary history in Italy has recently shown growing interest for the analysis of the spatial dimension, due to the great changes seen in the 1990s, from the end of the 'Repubblica dei Partiti' (Scoppola, 1997) to the crisis of the nation state. The history of the Italian Republic, 'relying on the foundational role of the parties in Italy, had been able, up to then, to combine the social and political level of analysis, as well as the central and local ones' (Salvati, 2011, p. 198). With the end of that system, Salvati states, the analysis of Italian history needs to go beyond the analysis of political parties as analytical instruments, and explore the spatial dimension and the territorial analysis of cultural processes in order to identify innovative approaches. This interesting perspective also corresponds to new proposals, emerging from recent studies, to overcome the state-wide political dimension and return to the spatial analysis of territorial differences (Barbanente and Salvemini, 2004). This approach allows for a better reading of the complex phenomena of Italian history, reconnecting the relationship between society, politics, and institutions, and understanding the complexity of the interplay between local pressures and decisions taken at central level. This is particularly relevant because centre-periphery interaction determines a system of multiple relations, and it becomes extremely difficult to restrain social phenomena or natural resources, such as water, fluid by its very nature, within strict administrative boundaries (Hadjimichalis and Hudson, 2004).

This paper builds on these suggestions and aims at reconstructing the paths and modalities of public policies and collective practices to reclaim the land, supply water to the people and irrigate the fields, implemented in Apulia over the last two centuries. It will try to explain the

distribution and the intertwining of territorial powers of water management in Apulia. This case study is particularly interesting because Apulia is a region extremely poor in surface water with critical hydrological disequilibria, yet with copious groundwater reserves (Denitto, 2012).

### **Environmental constraints and human action**

Water scarcity is one of the structural and long-lasting characteristics of this region. This has historically been visible through the hydrological disequilibria: malarial and swampy lands along the Adriatic and Ionian coast, and drought in the rest of the territory. These two phenomena represent environmental constraints that have, over the centuries, conditioned the type of settlements, crops, the agricultural landscape, the urban development, and the living conditions of the populations of Apulia. These phenomena have natural origins, however in the long run they have been exacerbated or reduced by human practices and by the policies that have been implemented.

Water scarcity has not only been due to frequent droughts, but also to the particular hydrographical conformation of the region, with very limited streams, having uncertain and erratic flows, and subject to flooding during winter. At the same time the region has complex and branched groundwater, circulating through karst cavities in areas such as Salento, Murgia, the Tavoliere, and Gargano (De Giorgi, 1897, 1909).

Therefore over the past centuries water has been the origin of different and contrasting phenomena to Apulian populations: an indispensable resource for life, health and agriculture, a threat because of the risks of landslides and floods, and even a source of conflicts and dispute due either to the scarcity or excess thereof.

At the same time it should not be forgotten that agricultural and collective practices have often contributed to exacerbating these conditions instead of alleviating them. It is worth mentioning, for instance, the appalling phenomenon of the substantial destruction of forests in Apulia during the 19<sup>th</sup> century, significantly worsening the extant environmental degradation with damage to the stability of both the soil and the water system.

Between the 1730s and 1880s the population of Apulia increased threefold. To cope with the increased population, the rising price of wheat and, more generally, the expansion of international markets, new land and agricultural resources were needed throughout the region. Thus did greater pressure upon the territory arise, causing substantial changes in the agricultural landscape: a sizeable tillage process and in particular high levels of deforestation began to make land available for the cultivation of grain. Within a few decades, with an alarming increase until the 1880s, thousands of hectares of woods and forests were cut down. In this way the environmental equilibrium, which had already been greatly weakened, was often undermined and destroyed. This, in many cases, caused devastating effects: landslides and alterations of streams occurred, dragging debris and stones downstream and favouring swamping and stagnation on the plains. Serious hydro-geological problems occurred in the hills of the 'Subappennino', with negative repercussions in Bari and in Salento as well. Recognising the caution due to different classification criteria utilised, the available data, however, paint a worrying picture: between 1870 and 1880 forests were reduced by 54% in the province of Foggia, approximately 49% in that of Bari and over 74 % in that of Lecce (Angeloni, 1884). Therefore, to the already present hydrological problem, yet another caused by deforestation and tillage was added. Furthermore, throughout the region

unhealthy and swampy areas increased, as did the victims of malaria.

The aforementioned factors have contributed over time in guiding public intervention, the expectations, and the practices of water supply to Apulian populations towards two main types of supply in order to meet civilian, industrial and irrigation needs. On the one hand, the conveyance of water that was available just outside of the region's confines was planned, through a strategy of 'water projects', i.e., the construction by the state and by its technical structures of complex systems of hydraulic works, necessary to overcome the distances between supply sources and end users. On the other hand, the exploration and exploitation of the only significant resource available in the region, groundwater, was increasingly performed by public authorities and by the population.

Since the political unification of the country, the history of water management in Apulia has been a story of the fragile equilibrium between water from the state and underground water, or between the water supply in the region by means of governmental intervention and the use of groundwater as a form of social adaptation, subsistence and self-organisation of the local population to cope with the scarcity of water.

It follows that in Apulia the human pressure on the subterranean aquifers, progressively accentuated, has historically represented the measure of the effectiveness of the strategy of large hydraulic infrastructure schemes, where delays and contradictions in state intervention have systematically been reflected in the misuse of groundwater by private citizens. The increasing use of boring, often misused by private citizens, has triggered worrying processes of degradation of underground water resources due to saline infiltration.

The distinctive historical feature of state intervention, focusing on the conveyance of water from and over different areas, sometimes extremely distant, is to be found in the encouragement of a control mechanism and system of governance regarding a resource that had to overcome, or in a certain way rescind from, the traditional geography of governmental administration, a geography based upon local authorities (provinces and municipalities) and intermediate levels (regions).

This attempt by the state, not surprisingly, was strengthened by the establishment of large technocratic structures, places of training and dissemination of knowledge, which promoted an interregional approach to water administration. This approach, prompted by the need to convey water from neighbouring regions, focused on the technical notion of river basins, as optimal territorial areas for planning, thereby overcoming the fragmentation produced by artificial administrative boundaries.

Even with regard to the process of reclamation and drainage of lands and malarial swamps, the administrative border, especially the one including the competences of municipalities, has become a constraint upon the organisation of policy intervention promoted by the centre and structured on the consortia, as means to ensure a more equitable territorial dimension and a higher capacity of funding (Bevilacqua and Rossi Doria, 1984).

Italian historiography has placed great emphasis on the history of land reclamation in Italy in general and in the 'Mezzogiorno' in particular. Over the past forty years it has focused upon different points of view which evaluate different scientific methods of investigation and different documentary sources. One major strand of research has viewed land reclamation as a major project of territorial/spatial planning and governance, calling for the mobilisation of economic forces, entrepreneurial and

technological abilities alongside appropriate legislation. With Nitti's project of electric irrigation, a comprehensive development of the Mezzogiorno (Barone, 1986) was aimed at. Several studies have analysed the many projects of land reclamation commenced, or merely attempted, in the southern regions during the 19<sup>th</sup> and 20<sup>th</sup> centuries as being laboratories for the study of the South, environmental and economic reform which necessitated new professions, such as engineers, doctors, agronomists, and planners (D'Antone, 1990a). Land reclamation has also presented a number of apt case studies for the analysis of the relationship between the state and the promotion and defence of national territory. Moreover, some research, beginning with the connection between swamps and disease, has studied malaria in order to describe a facet of the social history of the Mezzogiorno, and to analyse in detail the material life of southern farmers (settlements, mortality, nutrition, housing, and so forth) as well as individual psychology and collective imagination in relation to the cycle of disease. More broadly, land reclamation has been considered as a human struggle against the environment so as to seize land to be cultivated and occupied from its abandonment.

In recent years new scientific approaches have arisen, calling for a rethinking of the history of land reclamation, surmounting the economic approach, and cognisant of the interdependence of all the many elements within the ecosystem. In this direction, 'the environmental culture of the last decades has transformed the swamps, previously considered as lost land, into wetlands protected for the conservation of biodiversity' (Armiero and Barca, 2004; Bevilacqua, 2006).

The analysis of the operations undertaken in order to address the vast expanse of malarial land and swamps in Apulia means drawing attention to the character of the

Apulian hydraulic problem, which, as previously stated, was closely linked to the worsening of the relationship between the mountains and the plains, to the rainfall and to the new imbalances caused by the transformation of cultural structures and by the institutional innovations of the state.

In order to grasp the elements of continuity, and discontinuity, in water management in Apulia, a four-stage periodisation is proposed as follows: (i) the fragmented start, in the age of liberalism, from unification to the fascist regime; (ii) the attempts to modernise during the authoritarian fascist regime; (iii) the 'Special Intervention' and the reformist technocrats in the post-Second World War era; (iv) the long transition from the 1970s to the present.

In analysing each period we will seek to avoid the risk of oversimplifying the complexity of the relationships and conflicts, which the distribution of different powers on different parts of the territory determined, within the political contexts examined.

### **The fragmented start in the age of liberalism**

A primary period would certainly be the age of liberalism, when the legacy of early land reclamation was partially regenerated with the launch, during the preceding decades by the Bourbons and especially the Napoleonic authorities, of the Administration of Bridges and Roads and Afan de Rivera's Forest Water. In this period, the liberal elites prepared the first legislation aimed at two main objectives: on the one hand, to tackle, with different and fluctuating levels of effectiveness, the hydro-geological problems, worsened by increasing and indiscriminate deforestation caused by the general populace and on the other attempts to resolve the complex issues raised by water scarcity.



The legislative measures on land reclamation caused long, contradictory and complex processes. These were regulated by constantly changing laws, aimed at pursuing different objectives and following different approaches with regard to technological and scientific territorial/spatial planning, the social protagonists involved, resources mobilised and the allocation of reclaimed land (Bevilacqua and Rossi Doria, 1984).

With regard to water supply, local elites called on the state to intervene directly in order to rectify or alleviate the economic and social imbalances in the region and to address the scarcity of water, indispensable for hygiene and sanitation, with targeted involvement as well as making it the driving force of economic development in the region.

Thus, with the two laws of 1902 and 1904, the construction of the Acquedotto Pugliese (Apulian Water Works) began, conceived as a great work of hydraulic engineering and of social involvement. Initially the project began with a consortium between the state and the three provinces of Apulia, becoming in 1919 the Independent Ente Autonomo Acquedotto Pugliese (Autonomous Apulian Water Authority or EAAP) (Masella, 1995).

### **Attempts to modernise under the fascist regime**

Under the fascist regime, the problem of water management in Apulia was dealt with as part of an ambitious top-down project of modernisation, in which technocratic views, banking and industrial capital from the North and substantial public resources were to have constituted the backbone of the transformation of the countryside and the cities of Apulia. In that context, the regime attempted to develop the Apulian water works,

which ultimately failed, along with the entire programme of authoritarian modernisation during the 1930s.

The experience of land reclamation was also complex and contradictory; conceived as a means for the capitalist transformation of agriculture and land, it became an instrument of public intervention. Different results were obtained in different consortia of Apulia.

As shown by their activities in Apulia, Land Reclamation Consortia, designated as 'private associations, but with public functions', fared poorly. In the formation stage, the main questions concerned the demarcation of the area, the administrative and technical framework, the criteria for the contributions by the landowners in the consortium, the power of representation and voting rights in relation to the extension of land owned, the conflicts between small landowners (under-represented) and large landowners (who maintained a monopoly on decisions), and the conflict with the representation of the different municipalities.

Subsequently, when operations effectively began, conflicts and weaknesses came to the fore due to the lack of financial resources and the resistance by the owners to land reclamation and the transformation plans that had been developed by the experts. These plans involved strategic choices regarding priorities and methods to increase the economic value of funds. Thus land reclamation became an array of public works which improved the lands of large landowners and provided work to many unemployed, yet its legacy was to remain an unresolved problem until the post-Second World War period, that is to say a number of the swampy and unhealthy areas and the need for agricultural change (Serpieri, 1984).

### **'Special Intervention' and the reformist technocrats in the post-Second World War period**

In the aftermath of the Second World War, water administration and, more generally, the process of economic and social transformation of Apulia and the Mezzogiorno as a whole, ought to be looked at in consideration of the political and legislative framework of the great innovations of the 1950s (D'Antone, 1996b). With the launch of land reform and the beginning of Special Intervention through the Cassa per il Mezzogiorno (Mezzogiorno Funding Authority), complementary roles and responsibilities, sometimes conflicting, were defined and intertwined, that is to say between the new interregional bodies, originating after the Second World War, and those already present in the territory. Decision-making bodies, such as the Land Reclamation Consortia, the Acquedotto Pugliese, the Irrigation Authority, the bodies for agrarian reform and the Cassa per il Mezzogiorno, represented the core administration, the headquarters for planning, and the main financial boost for development in the southern regions.

If the works planned and largely carried out in the first fifteen years of the post-war period did indeed respond to the immediate needs of the population for drinkable water, the need for a super-integration of the water works system to meet the needs of the emerging industrial sector existed in early 1960s Apulia too. The needs for water grew evermore and thus spurred on the race for major hydraulic works in order to satisfy the growing needs of civilian use, irrigation and industry. All this was further fired by the conviction that this resource was inexhaustible.

The two large technical-structures, the EAAP and the Ente per l'Irrigazione e la Trasformazione Fondiaria in Puglia, Lucania ed Irpinia (Authority of Irrigation and Land Transformation in Apulia and Basilicata) or EIPLI, who already had an interregional structure, presented two different strategies in order to cope with regional water

shortages. The EAAP, which declared a cross-sectoral approach to water use, intended to boost resources from the waters of the Destra Sele basin in Campania. The EIPLI, on the other hand, aimed at creating new water infrastructures, reservoirs and inter-regional pipelines. Indeed, the inter-regional water projects did allow for the improvement of capacities on the one hand, yet on the other were subject to serious contradictions. These were first to be seen in the consumption of operations and in the resulting water dispersion, and, secondly, in the paradox of 'brand-new buildings that were already obsolete'. Owing to the great amount of time required for the financial and technical processes in building the infrastructures, it was extremely difficult to meet growing water demand with operations that were planned and executed on the basis of outdated estimations, estimations that had been based on much lower consumption levels.

During this period, the delays provided a strong incentive to local subsistence through boring, also assisted by the low operational costs involved, rendering this option increasingly accessible to large segments of the population; a push from the bottom, often illegal, and consequently taken out of the hands public authorities in terms of planning and control.

### **The transition from the 1970s to the present**

The final period began in the 1970s lasting up to the present and is characterised by the impact on water resources caused by the regionalisation process that started in 1970. The attempt to introduce an intermediate level of government in the state began a long period of transition lasting until today. The presence of the regional institute is to be regarded as a contradictory process, characterised on

the one hand by the fragmentation of public involvement and by cumbersome and complicated processes of migration and drawing of skills from old technical-structures (EAAP, EIPLI, Cassa per il Mezzogiorno, and Land Reclamation) to the Regione Puglia (Apulia Regional Authority). Then again, the Regione emerged as an interlocutor on policies developed at European Union level and as a place for training and the transmission of technical learning, e.g., biology and chemistry. This knowledge had so far been left at the margins of water management, only concentrating upon the principal issue on which the Regione was focussing its attention according to its ability, that is to say the environmental question raised by the problem of waste water disposal.

Opening in the 1970s, the entire system of water administration in Apulia and in the Mezzogiorno underwent a profound redefinition. The regionalisation of the state, indeed, alongside a greater level of democratic representation and autonomy, reintroduced artificial administrative boundaries in the management of a fluid resource such as water, and eventually heightened tensions, as in the case of the repeated controversies between the regional authorities in Apulia and Basilicata as far as the final destination of water is concerned. This in turn deepened the crisis of infrastructural policies promoted by the Special Intervention (Bonatesta, 2012).

In the 1990s, with the division of competences between the European Union, the state, and the regional authorities, a process of redefinition of water management developed. This redefinition focused on recovery from the old situation of disorder and fragmentation caused by regionalisation and by the ending of Special Intervention. Initiated by the land/soil protection Law 183/1989 of 1989, this process continued with regulatory measures of great importance, promoted by the European Union.

Among these, the *Water Framework Directive* (WFD) 2000/60 has been of great importance. The emphasis on water as a precious resource brought about a shift in the problem of water management, from the supply-side policies that focused on the role of grand operations of conveyance, towards policies of protection, i.e., towards a more appropriate dimension for traditional regional powers. Following the approval of the WFD by the European Union, even the state level adapted, removing the responsibility for water administration from the Ministry of Infrastructure and assigning it to the Ministry of Environment.

The gradual implementation of the WFD at national level, with the Legislative Decree No.152 of 2006 and the subsequent Law No. 13 of 2009, has not prevented the activation of the ambitious project of the Directive, namely the creation of major river basin districts within the whole national territory. These districts are aimed at overcoming administrative fragmentation and at simultaneously creating 'a co-ordinated and sustainable management of water resources'. This project has become a reality in recent years with the establishment of the Distretto Idrografico dell'Appennino Meridionale (Hydrographical District of the Southern Apennines), which is to include the area around the continental Mezzogiorno. The signature, on the 6<sup>th</sup> of April of 2011, of the 'Memorandum of Understanding', prior to the agreement between all regions belonging to the district, re-proposes, with a renewed vigour and new bases, the faded image of the major projects and hopes of the reformist technocrats of the Special Intervention, so as finally to create an inclusive administration of the water resources within the Mezzogiorno as a whole.

## **Conclusion**

Moving away from Apulia, we may then make some general considerations.

In order to ensure and guarantee administrative and governmental inclusiveness, it is necessary to act collectively so that the legitimate needs of every individual and of every community determine a sustainable use of water resources and do not instead lead to unchecked human pressure that menaces the very existence and prospect of using these resources.

In the past, only the needs of health, hygiene, economic and social development prevailed, leading to the exertion of disproportionate pressure on water resources. In contrast, very little heed was paid to environmental needs and ecosystems. Therefore, today there is a need for a radical trend reversal in the management and protection of water, concordant with a more comprehensive view of its different uses (domestic, industrial, agricultural, tourism, and social): an integrated approach for comprehensive planning that involves all public and private individuals and bodies. This will make it possible to overcome the conflicts and overlapping responsibilities between different bodies, authorities, and territories in order to avoid irreparable damage to the ecosystem and promote sustainable water management.

Today, the main legislative instruments for water management, at European Union, national and regional level, are moving towards breaking the old vicious circle of having to satisfy growing demand with increasing amounts of water. They are now rather seeking to formulate general rules aimed at a balanced use by all final water consumers and/or users by means of good practices in saving, re-utilising and recycling this precious resource.

The need to accommodate the deep social and economic dynamics at the basis of the continuously increasing demand for water has imposed a progressive integration of

the different challenges determined by human water consumption. Today, this means that the main instruments of water management regulation cannot continue to address the issues concerning the harvesting, conveyance, distribution and disposal of water in a disjointed and fragmented manner. These instruments instead ought to assemble an integrated water system, managed by a single unit, led by a single authority over each territory, be it the optimal area or the river basin, suitable for the control of a resource which is, by its very nature, fluid.

There has also been a change in direction in the collective consciousness: water, more than being an economic resource, is a resource that is essential for life. The resolution adopted by the United Nations General Assembly in July 2010 (United Nations, 2010), declared access to water for health and nutrition as a human right. This is undoubtedly an important step forward however it alone does not imply any binding agreement or ratification, hence the need to promote policies and initiatives at different levels of governance conscious of the fact that water is fundamental and essential for the survival of human beings and of natural ecosystems yet also a finite and depletable resource.

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