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Myths, Falsehoods, Paradoxes, Errors and Virtual Water in Mediterranean Europe: The Case of the Iberian Peninsula

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The statement that everything remains the same in Mediterranean Europe in matters of continental waters following the course of the last three decades is untrue. In effect, following the drought of 1995 or perhaps coinciding with it, social movements and a high proportion of scientists and even numerous members of the administrations have dealt extensively with the issue. As a result of the many books, articles in scientific journals and conferences, etc., expression New Water Culture, demand management, water quality etc. are today highly promoted amongst academics and managers to such an extent that they considered themselves as fellow believers of these new tendencies in water policy or, at least, few dare to publically state their opposition to them. But, in reality, have the aforementioned changes and other developments substantially affected the principles that inspire current hydropolitics in Mediterranean Europe? Or, on the contrary, do "old ghosts" reappear whenever there are periods of less rainfall? This article discusses and differentiates some aspects of the water situation in Mediterranean Europe and, above all, the correlative management models that have been developed in recent decades with a particular analysis of the cases of Spain and Andalusia. It asks whether the previous diagnosis is still correct today or, on the contrary, the cultural and institutional changes that have already taken place have been appropriate and sufficient for the establishment of a New Water Culture in Southern Europe. Frequently used terms, expressions and concepts such as throwing water into the sea, hydraulic works are in the general interest, wet Europe and dry Europe, the water transfer will definitively solve the problem, water deficit, water must be distributed fairly, everyone has a right to water, water is a public asset etc. shall be reviewed from a scientific approach. The concept of water scarcity is normally unquestioningly assumed by people and the administrations that irrationally integrate it into public policy. This article discusses and differentiates the concepts of physical and economic scarcity, of the prices and effects these have on the efficiency and equity of water management and usage. As well as an analysis of the problem of the pollution of continental waters, there is also a brief examination of the pollution caused by their discharges into the Mediterranean Sea. There is a discussion of a number of general comments in regards to water transfers and provide a short overview of three of the most controversial of these works in Spain: The Ebro-Almería, Tajo-Segura and the Castril River Water Transfer. A new line of research is presented for the management of water, the virtual water approach that produces and confirms the results I already previously obtained through conventional procedures. The last section describes the economic effects on agriculture and tourism that climate change is causing in a number of Mediterranean regions. It is to be stated in advance that the conclusion is: The New Water Culture (NWC), from the South, demands the prior recognition that the biggest statements on the scarcity of water are not the result of climatic conditions, rather, they are due to the economic development and social model followed, misgovernment by competent institutions and, definitively, because the conflicts made evident between different users have solely been resolved with arguments of political and, ultimately, economic power.

Keywords: *Mediterranean, water, crops, tourism, prices, pollution, virtual water*

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Presentation: Diagnosis

The European Water Framework Directive, along with supposing, of course, the homogenisation of legislations and policies in matters relating to continental waters of member states, is configured as a decidedly environmental regulation as it pays particular attention to the conservation of river ecosystems and other water masses, as regards both quantitative and qualitative aspects.

It is obvious, therefore, that at least formally speaking quite a number of detailed aspects of water policy have changed in some countries in Mediterranean Europe and in particular the Iberian Peninsula. Amongst others, the controversial Ebro-Jucar-Almería water transfer has not been constructed, and senior members of the Administration declare themselves in favour of the principles that inspire the New Water Culture (NWC), with others even being promoter members of the Foundation that uses this name.

But, in reality, have the aforementioned changes and other developments substantially affected the principles that inspire the water politics of European Mediterranean countries? Or, on the contrary, do "old ghosts" reappear whenever there are periods of less rainfall?

What ever happened to the former water managers, the members of the so-called "cement paradigm", and the professionals who referred to the members and supporters of the NWC at the very least as "amateur ecologists". Are reservoirs no longer being constructed for which there will never be water to fill and that even represent a danger for many people who live downstream? Have economic water accounts been integrated periodically and systematically into the National Accounts and, as a result, is water politics now socially rational and transparent?

I fear that, at the very least, there is no satisfactory answer to any of these questions and that, despite the undoubted changes that have occurred, perhaps too many aspects of the *hydropolitics* remain unaltered among us. Moreover, even worse, I observe that, taking the terminology from our most recent past, the symbols and discourse of the NWC have been almost automatically assumed, without the least ideological resistance coming from an influential proportion of "born and bred democrats" so that, in reality, few things substantially change.

It has been twenty three years now, in a different institutional context, since I had the opportunity to direct and coordinate the *1st Water Congress in Andalusia: The Water Debate from the South*, University of Granada, 2001, of which the presentations reviewed in the debates were published, and my thesis on the water situation was as follows:

> The New Water Culture, from the South, demands the prior recognition that the biggest manifestations of the scarcity of water are not the result of climatic conditions, rather, they are due to the economic development and social models followed, misgovernment by competent institutions and, definitively, because the conflicts made evident between the different users have solely been resolved with arguments of political and, ultimately, economic power (Castillo 2001, p. 79).

The lack of government that has presided over *hydropolitics* in Spain and Mediterranean Europe has been supported by the technical and human deficiencies

of the Administration and the fact that both within it and in a considerable number of social sectors a large series of falsehoods and conceptual errors are accepted as being true.

A considerable number of texts, amongst which perhaps the most institutionally relevant was the Preamble of the previous partially repealed of the 2000 Law of the National Hydrological Plan of Spain, which contemplated the controversial water transfer from the river Ebro along the Mediterranean coast to the province of Almeria, clearly set out what the essence of the water problem in Spain was for the Administration of that legislature and, therefore, its *correlative and logical definitive solution*:

> In a country such as Spain, in which water is a scarce resource, marked by serious hydraulic imbalances due to its irregular distribution, the adequate planning of water policy is imposed as a necessity that cannot be remain separated from this reality and as an instrument for the overcoming of it (Castillo 2002, p. 14).

This paragraph clearly expresses the official diagnosis in regards to the only problem that occurs with water in Mediterranean Europe and, likewise, what the resulting appropriate policy is for solving it: In Mediterranean Europe nature has provided water in an *unbalanced* way; that is, unequally distributed, in particular in territorial and seasonal terms and, therefore, it must be *corrected* (BOE 2001).

The spatial-seasonal disparities of the official diagnosis have, as logical correlations, *deficits and surpluses or excesses*, with reservoirs being the attempted solution for the former, and water transfers for the latter. In other words, if water in Mediterranean Europe is poorly distributed or unbalanced, reasons of solidarity recommend rebalancing it through transfers from where there is a surplus to where there is a deficit. In this manner we obtain the desired *national hydraulic balance is obtained* (BOE 2001).

The lack of government that has presided over *hydropolitics* in Mediterranean Europe has been supported by the technical and human deficiencies of the member states and the fact that both within it and in a large number of social sectors a large series of conceptual falsehoods are accepted as being true:

- Hydraulic works are in the general interest.
- The transfer and other projected works will definitively solve the problems relating to water.
- Dry Europe and wet Europe.
- Water surplus or excess and deficit or lack.
- Pouring water into the sea.
- Seeing water flow by you and not using it is a waste.
- Water must be distributed fairly.
- Water is a public asset.
- Everyone has a right to water.
- Hydraulic works are in the social interest.

These *errors*, however, are not *innocent*, given that their logical correlative is the urgency in resolving an *unbearable* situation and, as a result of this, the correlative, imperative, *urgent and unavoidable convenience* of constructing one or more hydraulic works. A large proportion of those who exhibit these arguments are educated, and this does not mean simply to the level of baccalaureate (ESO) in Spain, rather, many of them boast master's degrees from renowned business schools in England and the United States and today hold important executive posts in large construction companies or the very administrations of Mediterranean Europe.

This attitude will, furthermore, be more politically profitable for their promoters and even economically for their direct service providers, than the truly rational measures from the social and collective perspective. Finally, people are unaware of the lack of government that presides over *hydropolitics* and who its true beneficiaries are, which deactivates or dampens their potential manifestations of non-conformity and social responses.

But, who is going to finance hydraulic works? What social profitability do they foresee, or is there even a simple, prior cost–benefit analysis? Will these works definitively solve the water problem in the region?

All social researchers know, and some have even personally experienced, that an essential requisite for a good professional reputation, in other words, to assure ourselves that our judgements are considered as sensible and are not overcome by *modern times*, consists in abstaining from sustaining those that imply inadmissible implications for public policy or determined influential sectors. The aberrant result is that all too often there is a proliferation of mediocrity and patronage amongst those with high profiles who, amongst us, normally take the form of *useless but successful* teachers and researchers.

Or, put another way, it is essential to *topple the myth to unmask the tricksters*.

Water *Scarcity* and Administration

The policies and regulations on complex, that is, real social matters, such as water, lack miracle-working power and cannot therefore be directly applied. Even in the event they are well constructed, they will not automatically provoke the positive effects they intend; rather, to do so they require an adequate, sometimes exhaustive regulatory development and, moreover, must be accompanied by sufficient quantity and technical capacity in the Administration to which the application thereof corresponds (Muñoz 2015).

The Economic Statistics of Water

Furthermore, although a number of differences are shown amongst researchers in its exact disposal, it is clear that nearly all water academics coincide on the fact that the many advantages that a transparent management of water would lead to are obvious. But, paradoxically and despite the strategic importance of this

resource, it is noteworthy that in the southern regions of Europe there is a current lack of availability of basic statistics or, as a result, the economic accounts of water essential to bring it about (CEDEX 2000, EUROSTAT 2023).

In reality, the result is the misgovernment that presides over water matters in southern Europe and the majority of conflicts between potential users are resolved with power related arguments and clearly regressive and inefficient distributive consequences.

For this reason, researchers have been insisting for years that it is essential and urgent that the National Statistics Institute of Spain (INE), other European countries and Eurostat in Europe make the necessary efforts to implement a European, National and Regional Water Statistics System, which covers these unfortunate gaps and that, in this manner, contributes to satisfying the growing demand for basic data necessary for creating more complex indicators of a socio-economic nature. In this same regard, it would be convenient for experts and scientists, in particular those from the social sphere, to unrestrainedly employ analytical tools and methodologies are most certainly used appropriately in other objects of research, given that in reality the mistakes shown by the diagnoses of the situation are not innocent, and the resulting *hydropolitics* are tremendously detrimental to society in general.

In the majority of conventional texts on the management of water the term water policy does not appear, instead they mention hydropolitics (Costa 1911). This is not an honest mistake. Water policy, like any other sectoral policy, involves ordering available resources, establishing objectives and designing the means to achieve them, discussing prices, the protection of ecosystems, etc. In turn, hydropolitics means simply and precisely hydraulic works policy. In other words, the construction of works destined towards storing, transferring and distributing water.

Continental Water in Mediterranean Europe: Physical or Economic Scarcity?

The territorial structure of the hydraulic systems of Mediterranean Europe are faithful reflections, in terms of natural and available water resources, of their geographical locations in the inadequately named *Dry Europe* and, in terms of usage, of the characteristics of the socio-economic systems of southern Europe and the management that has been implemented in recent decades.

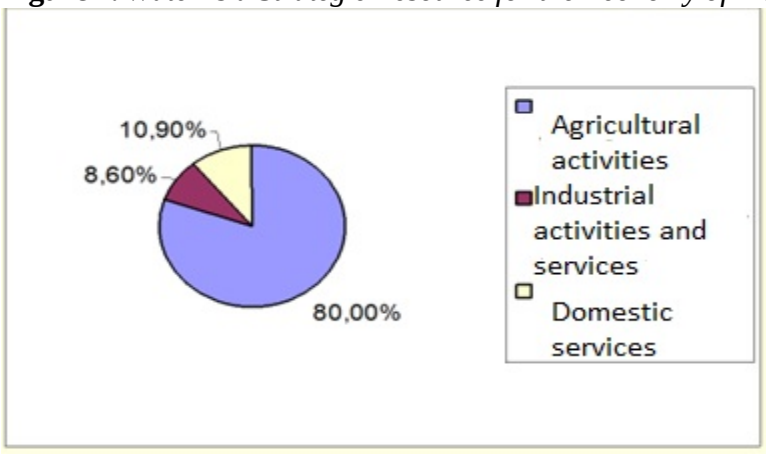
The 18 European regions considered as Mediterranean are found in Spain(2), France(3), Italy(5), Malta(1), Slovenia(1), Croatia(1), Greece(4), and Cyprus(1).

For example, the annual rainfall in Andalusia (Spain) reaches an average of 54,000 hm^3, that is, it is similar to some regions situated in *Wet Europe*. Nevertheless, the extreme seasonal irregularity, the frequently torrential regime, the high evaporation caused by high temperatures, soil infiltrations, etc. in reality reduce available water resources to 24% and collaborate in giving the Andalusian hydraulic system the typical characteristics of those that exist in the Mediterranean European regions (Castillo 2001).

But, in reality, the *scarcity* of water in Mediterranean Europe is not physical, but above all socio-economic and political. Firstly, there are no economic accounts

on water and even less likely are they to be integrated into national accounts. However, some things are known "off the books" through studies by some regional administrations and individual researchers. As it can be seen in Figure 1, the regional water demand is distributed in the following manner: 80.6% to agricultural activities, 8.6% to industrial activities and services and, finally, 10.9% to domestic uses (European Environment Agency 2022).

Figure 1. *Water is a Strategic Resource for the Economy of Mediterranean Europe*



Source: European Environment Agency (2022) and own creation.

Agriculture in Mediterranean European countries accounts for the use of approximately 80% of available water, causing serious supply and pollution problems, with these countries furthermore being those that will be most affected by climate change, thus exacerbating the pre-existing situation

Given the weight of some sectors, in particular agriculture, followed by tourism, the assertion that water constitutes a strategic resource for Mediterranean Europe is widely shared.

A) THE PRICE OF WATER FOR URBAN USES.

In Table 1 you can see the price range in European countries ranges from the highest in Denmark (7.31 euros/m^3) to the lowest in Bulgaria (1.37 euros/m^3).

Table 1. *The Price of Water for Domestic and Urban uses in Selected European Countries (Euros/m³)*

PRICE OF WATER FOR DOMESTIC USES IN EUROPEAN COUNTRIES (Euros/m³)

Countries	Supply	Sewage and treatment	VAT and other taxes	TOTAL
Denmark	2.66	3.19	1.46	7.31
Netherlands	1.49	3.62	0.1	5.21
Finland	1.6	1.95	0.85	4.4
United Kingdom	2.05	2.31	0	4.36
Sweden	1.29	2.01	0.83	4.13
Belgium	1.99	1.88	0.23	4.1
Austria	1.73	1.9	0.36	3.99
Cyprus	1.46	2.39	0.07	3.92
Norway	1.37	1.64	0.75	3.76
France	1.85	1.54	0.22	3.61
Spain	1.14	0.83	0.22	2.19
Portugal	1.14	0.91	0.1	2.15
Hungary	0.91	0.72	0.44	2.07
Poland	0.92	1.14	0	2.06
Romania	0.7	0.52	0.29	1.51
Bulgaria	0.88	0.26	0.23	1.37
Italy	0.42	0.58	0.1	1.1

Source: FUNCAS (2019) and own creation.

Observe the irrationality of water prices in Europe, that is, in those countries in Central and Northern Europe where greater quantities of available water exist (Denmark, Finland, Netherlands) the prices of water for domestic use are lower than in Mediterranean European countries where lower quantities of available water exist (Italy, Spain) (Funcas 2019).

According to the results produced by the recent AEAS-AGA in Rates Study (Asociación Española de Abastecimientos de Agua y Saneamiento 2022), the average price of water for domestic use in Spain stands at €1.97/m³ (VAT not included). Of this amount, €1.09/m³ (55%) corresponds to the supply service and €0.88/m³ (45%) to the drainage service.

B) PRICE OF WATER IN AGRICULTURE

The average payment of irrigators for water services for this activity in the Iberian Peninsula has been estimated at €263/Ha per year, but the price interval by volume fluctuates between €0/m³ up to €0.72 euros/m³, and even higher, depending on the origin of the water: rivers, reservoirs, transfers, desalination plants, etc. and direct and indirect subsidies from administrations (Hispagua 2023).

The price dynamic clearly operates contrary to incentivising the saving and efficient use of water in Mediterranean Europe and, from this point, it is not difficult to deduce that the agricultural sector constitutes the framework in which

policies aimed at saving and improving efficiency etc. find greater margins for manoeuvre, given that until now the payment system in force has made it difficult.

Moreover, water prices produce inequity because they cause transfers of income via public subsidies in water prices effectively paid from citizens to large landowners.

It should be borne in mind that irrigation by gravity or flooding consumes four times more water volume than the drip system for the same quantity of vegetable matter.

Keep in mind that gravity or flood irrigation consumes four times more volume of water than the drip irrigation system, for the same amount of plant matter and, as can be seen in Table 2, the volume of water used by the technique Gravity irrigation still represents 36.1% of the total volume of water used in agriculture.

Table 2. *Volume of Water Used by Irrigation Technique (Hm^3)*

Irrigation Type	**Volume**	**%/ Total**
Sprinkler	3.996	26.4
Drip	5.677	37.5
Gravity	5.454	36.1
Total	**15.129.132**	**100**

Source: INE (2020).

Given the existing system of water prices, there is a lack of relative importance relating to the cost of water for farmers in relation to the value of the final agricultural production and, as a result, scarce interest on the part of farmers in the installation of more efficient and water saving irrigation systems.

In other words, water constitutes a limiting factor for economic development models in Mediterranean Europe.

The most recent experience reveals that the subject of water is an adequate refuge for *the inefficient, tricksters and the successfully useless*. It is obvious that if we achieve water transfers for Andalusia or other regions of Mediterranean Europe, incorrectly referred to as *dry regions*, in the short term the situation will improve for a large proportion of farmers and their physical or intellectual promoters will gain social status, given that *they will have contributed to the definitive solution of the water problem*. sic!

If they are afforded, for example, the opportunity to analyse in-depth the available statistics on the inadequately named *water balances* in the basins that flow through Andalusia, they will at the very least become perplexed in the face of the seasonal series of the inadequately named estimated *deficits*. For example, in 1981 the Guadalquivir Basin had a deficit of 400 hm^3. The following twenty years saw the construction of 23 reservoirs, which supposed a 45% increase in the capacity of regulation. But, surprise, in the year 2000 the deficit continued to be the same as in 1981 and in 2001 it was even somewhat higher (489 hm^3) (Castillo 2001).

How can a balance be found between these apparently contradictory figures? Simply because in this area there was a spectacular increase in uses that were,

furthermore, increasingly polluting, together with an almost non-existent or, where relevant, unrealistic planning and inefficient management. The result of traditional *hydropolitics* is that the requirements have been year after year, and increasingly, higher than available resources, in an institutional dynamic that appears to ignore or, rather, attempt to obscure the unsustainability of this development model and the resulting *hydropolitics* designed for the provision thereof. In short, the traditional *hydropolitics* implemented in Mediterranean Europe in recent decades has created problems for water users at a greater pace than the numerous and costly works that have served as a pretext have been constructed.

On the side of hydraulic resources, the presence of water has traditionally conditioned human settlement and the development of population nuclei, to the extent that they needed to guarantee not just water resources essential for human consumption, but also those necessary for the development of their productive activities. In Mediterranean Europe, however, disjointed industrial development, with decision-making centres in other locations, the growth of the tourism sector and the large population centres along the Mediterranean coast, the agricultural specialisation in irrigation crops and abandonment of dry farming, etc. has meant that the spatial distribution of water resources has stopped coinciding with that of its needs, to the extent that precisely in the places and periods of the year in which the natural provision of water is lower, the requirements have increased spectacularly, to which the greater relative scarcity of water resources in Mediterranean Europe has taken place, moreover, with enormous spatial and seasonal imbalances.

Water Pollution in Mediterranean Europe

Diverse characteristics of the typical socio-economic structure of Mediterranean European countries are significantly contributing to the deterioration of the quality of continental waters both on the surface and underground, situating the rivers and reservoirs of the lands closest to the Mediterranean amongst the most polluted in Europe.

The difficulties in Mediterranean Europe with continental waters are not just related to quantity, but also and ever increasingly to quality. In other words, a proportion of available water lacks the quality required for priority human uses due to pollution.

To put another way, in the greater part of Mediterranean Europe our water management model is environmentally unsustainable.

Pollution of Coastal Waters

The concentration of the population in a reduced number of cities, precisely where water run-off is lower (concentration effect) and the existence of highly polluting industrial sectors (petrochemical, oil, alcohol, sugar, etc.), the growing use in agriculture of phytosanitary products and chemical fertilisers, etc., all contribute to the fact that the coasts of Mediterranean Europe are highly polluted.

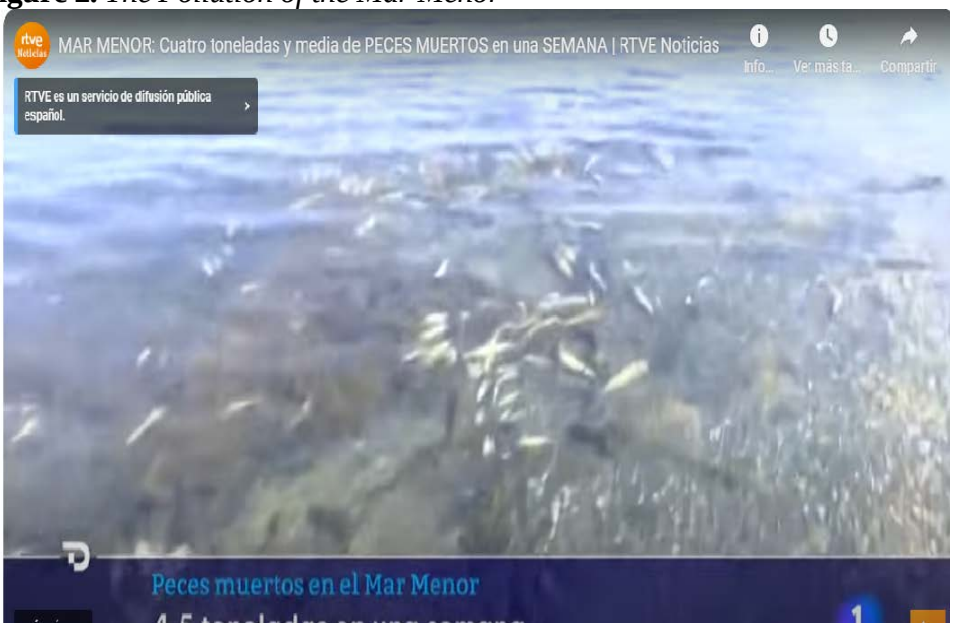
According to the study by the European Environment Agency European Environment Agency (2018), 60% of European waters failed to reach the minimum ecological state of "good" or "very good", set in the EU Water Framework Directive, during the 2010-2015 monitoring period.

A proportion of the waters in poor ecological state or that are untreated originating from tourist populations end up in the Mediterranean.

90% of the waste floating in the European Mediterranean is plastic, which of course has a negative effect on tourism and provokes an enormous mortality in marine species that, in part, enter the human food chain (RTVE 2023).

One of the negative interactions between agriculture, agrochemical products and the Mediterranean Sea occurs in Spain in the Mar Menor, a coastal salt water lagoon in the region of Murcia, separated from the sea by a 22 km long sand barrier (Figure 2).

Figure 2. *The Pollution of the Mar Menor*



Source: National Geographic España (2023).

The scientific diagnoses of the situation and the causes that have provoked the growing deterioration of this ecosystem are practically unanimous: The expansion of farming, urban and mining activities that involve the intensive use of nitrates and phosphates that reach the Mar Menor via the basins that slope through the region of Campo de Cartagena are leading to episodes of advanced eutrophication

Many People who wish to Visit the Graves of their Parents would have to do so in a Diving Suit

The construction of reservoirs has a long tradition in Mediterranean Europe going back at least to the Roman times.

As of April 2023 in Spain there were 1,225 large dams and reservoirs, being the EU country with the highest number of these works, and the sixth in the world. The storage capacity is 56,069 hm^3 but the quantity of water effectively stored is 26,648 hm^3 (Ministerio para la Transición Ecológica y el Reto Demográfico 2023).

The majority of these hydraulic works were constructed in Mediterranean Europe from the 1940s onwards, at the end of the Second World War (1939-1945) or in Spain after the Civil War (1936-1939).

In Spain in recent times the very grandeur of the work itself constituted an end in itself. It is convenient to remember to these effects that a frequent *NODO* image in post-civil war Spanish cinemas was the figure of General Franco or the *Caudillo* (leader) or typical minister cutting the ribbon of the inauguration of a reservoir, a construction that of course lacked even a minimal cost–benefit analysis in social terms.

NO-DO was a propagandistic news service created by the Franco dictatorship that was compulsory viewing shown in cinemas before the main feature between 1942 and 1981).

Nevertheless, it must unreservedly be recognized that in the situation of autarchy of the 1940s or in the middle of the world economic crisis of the 1970s, the expansive politics of water had considerable justifications from the perspective of the general interest, despite the fact this was not precisely the objective sought by its promoters.

The poorly-named recurring *droughts* in Mediterranean Europe have shown added to the high monetary costs of the mass construction of reservoirs must be the damaging social costs to which they have given rise.

At present together with the questioning of the strictly economic profitability of many of the hydraulic works completed, which would not pass a simple cost-benefit analysis in monetary terms, there must be the institutional limitations of the European Water Framework Directive and above all the responses from the population from the social, cultural, environmental etc. perspective (human loss, flooding of valleys and towns, immersion of historical heritage, breaking up of regions, uprooting of inhabitants, destruction of natural heritage, etc.).

In Spain there is currently a proliferation of hoaxes (Newtral 2023) on some social networks on the mass destruction of reservoirs, undoubtedly for electoral reasons. The reality is different, with storage capacity even growing in recent years.

These statements and signatures are false and lack any foundation whatsoever: “Spain is now the country that is destroying the most dams in the whole of Europe”; “108 dams demolished in 2021; 148, in 2022; and 43 in the first four months of 2023”; “we’re in the middle of the worst drought in memory, but the Government boasts about being a ‘global example’ in the demolition of dams”, and “who is mainly responsible for hosepipe bans and drought in Spain? (Neutral 2023).

An objective repeatedly stated by European governments is to achieve the situation where healthy nature contributes to the physical and mental well-being of European citizens, and in order to collaborate towards it there is a plan to restore at least 25,000 Km of rivers returned to a free-flowing state. This measure is

indicated as one of the key elements of the European Union Biodiversity Strategy for 2031, which is in turn a measure included in the Europe Green Deal 2019 (European Parliament 2023).

A 2020 study entailing an exhaustive analysis of the fragmentation of European rivers concludes that at least 1.2 million barriers exist that fragment the rivers in 36 European countries, of which 15% are considered obsolete (Belleti et al. 2002).

The fast pace of the elimination of river barriers in Europe is justified by the diverse impact they have on river ecosystems

Particular attention is drawn to a series of river barriers that had already come to the end of their life cycle, which lack economic function and that in reality now suppose a safety problem.

The main types of river barriers are dams but also diversion dams, overflow, channels, fords, sluices, ramps, etc.

The reality is that in Spain seven dams were demolished between 2007 and 2018, all for reasons of safety (cracks, silting, etc.) following the end of the concession as demanded by the Water Act.

In Spain in recent years a number of dams have been removed. Some examples are El Tranco, Robledo de Chavela, Anllarinos and Yecla de Yeltes. Furthermore, the World Wildlife Fund (WWF) reported others such as Inturia and Retuerta. All of these constructions were demolished between 2007 and 2018 for safety reasons –cracks, silting, etc.– or due to disuse following the end of corresponding licences, as demanded by the Water Act. In percentage terms, around 0.3% of the dams present in Spain in this period of time would have been eliminated (Ministerio de Agricultura y Transición Ecológica 2023).

Project to Transfer the Patio of the Lions of the Alhambra in Granada to the Metropolitan Museum of Art in New York?

What would people think if one morning they woke up to the news in the local press of the city of Granada that the Spanish and American government had agreed for reasons of solidarity and differences in artistic sensitivity of the inhabitants of both sides of the Atlantic Ocean to proceed to transfer the Patio of the Lions in the Alhambra to the Metropolitan Museum of Art in New York, of course after the compensation of a *fair fee*?

The official justifications for the need to carry out inter-basin water transfers are usually plagiarised from other projects, extremely deficient and plagued by contradictions, omissions and technical errors (Castillo 2001, 2002).

Perhaps the most important errors that are not innocent are *there is a zone where a water **surplus** is stated and another that suffers from a water **deficit** and if the planned transfer works are carried out the situation of the receiving zone will be **definitively** solved.*

My over 35 years of research experience in water politics in Spain, but also in other European, South American and African countries has taught me that innocent mistakes are not normally made, above all, by high-standing

professionals with extensive experience, such as engineers and heads of planning in Spanish hydrographical confederations and their peers in other countries who have probably obtained master's degrees from renowned universities in the USA.

It is clear that the irrationality of the application of traditional water policy transferred to the current socio-political and climatic context finds its accomplice in needs that require short term satisfaction. In effect, in the face of a situation in which the quantity of water is inferior to the appetites communicated by users, traditional *hydropolitics* has responded with the construction of urgent works, reservoirs, transfers, etc. that will not provide a definitive solution to, rather amplify and prolong the problem, due to the consolidation and even creation of expectations of new uses.

In other words, if the intensity of the *last drought* is not the first time it has occurred amongst us and if, despite the enormous number of reservoirs and water transfers constructed in recent decades the repercussions and social perception thereof have been greater than no other occasions, is it not the developed *hydropolitics* that have been erroneous or, at the very least, insufficient...?

The mere use of the term *guaranteeing supply*, which is normally included in the justification of many hydraulic works, unintentionally reveals that the works were not and are not necessary and neither of course was there an urgent problem to solve. In many cases the hydraulic works are not normally carried out for example, as would correspond to situations of emergency, because the authorities in question foresee that the situation of scarce rainfall in the previous winter is going to mean that in the following summer people are not going to have enough water to satisfy basic domestic needs. It is obviously not about this, given that on those occasions when a works have not been constructed the population has not been subject to misfortune or irreparable disastrous events (Castillo 2013).

Furthermore, periods of scarce rainfall, considerable rainfall, powerful storms, etc. is the natural sequence of Mediterranean Europe and *domesticating* nature would imply an extremely high monetary cost as well as diverse natural catastrophic consequences, which the large majority of educated citizens and non-experts are not prepared to admit.

Errors in water accounts, in the event these instruments exist, which provide the basis for the official diagnosis of the water situation are not innocent, while they justify the irrational measures of *hydropolitics*, from the perspective of collective social wellbeing, which, in contrast, are beneficial for their instigators. Moreover, the latter avoid having to face the likely social response that would result from general knowledge of the social consequences of current *hydropolitics*.

In addition, with the researchers and public managers partially unshackled from the urgency of the short term, id a more appropriate atmosphere to freely, in the case of the former, express the results of our research and, in the case of the latter, adopt the policies and take the economically and socially rational measures in water related matters, although in many cases they will not be understood nor, as a result, applauded by wide sections of the population.

It must be taken into account that it will always be more popular, in other words, translated into the language of politics, it will provide more votes, above all those of farmers, for example to build hydraulic works (reservoirs, water transfers,

etc.) and appear in the media in the inauguration act than, for example, to raise the price of water to farmers, sanction illegal irrigation or unauthorised dumping, or cut or reduce the water supply to inhabitants of a town at certain times, etc.

In short, the historical evolution of precipitation in Mediterranean European countries reveals the reality of a sequence of seasons with scarce rainfall followed by others that show torrential characteristics with this regime, furthermore, inserted into irregular pluriannual cycles.

For this reason, the construction of costly works both from the monetary and ecological perspective does not justify the fact that every time there is a season or period of low rainfall other additional works should be carried out with the aim of reducing the effects thereof. Amongst other reasons, because there would be a need for a constant building of numerous works throughout the entire region and when they became operational the most likely situation is that the precipitation conditions that justified them would have changed.

In brief, the true general interest demands the implementation of planning for the supply of water and its long term use in which, fortunately, European legislation places the quality of continental water and associated ecosystems in a preferential position.

The articulation of the study and monitoring of the last 50 years of *hydropolitics* developed in the Iberian Peninsula and other Mediterranean regions reveals that, in general, far from providing a definitive solution to the problems that they admittedly attempted to confront and that justified it, water transfers create false expectations, generate and incite social and environmental conflicts, encourage wastage of hydraulic resources and, in short, intensify and perpetuate difficulties.

In second place they create or exacerbate social conflicts for very long periods of time between those zones that transfer and those that receive water, pitting the populations of different places against each other, along with those institutions that find themselves immersed in extremely costly legal proceedings, even those on the same political or ideological sides.

The transfers of continental waters in the Iberian Peninsula are nothing new. The late Middle Ages saw the transfer of the Villena Lagoon (Villena, Alicante) to the Huerta de Elche (Elche, Alicante).

However, the first large works to transfer water from other basins came about in the 16th century with the Huescar Channel, in the Guadalquivir basin, where the Castril and Guardal rivers meet, to carry the waters to the River Almanzora basin, and thus irrigate the fields of Lorca and supply the arsenal in Cartagena (Castillo 2013).

There have, subsequently, been a high number of plans for water transfers of which some have entered into service and others have not, but a large proportion of them have been aimed at regions in the Mediterranean, particularly in the south eastern peninsular.

A) THE EBRO-MURCIA-ALMERIA WATER TRANSFER

In recent periods, save for the 1993 National Hydrological Plan of Spain, which designed a fantasy *homeland* of remote controls, satellites, pipelines,

elevating stations, canals, tunnels and siphons crossing the geography of the Iberian Peninsula with the acknowledged plan of achieving a perfect *national water balance*, which fortunately was not applied, the 2000 National Hydrological Plan (Castillo 2001, 2002) contemplated the transfer of the Ebro from Tortosa (Tarragona) to Almería, 845 Km long and which would distribute 1,050 hm^3 along the Mediterranean coast.

This project received 96,000 allegations from individuals, ecologist collectives, and large unions. Of the 83 reports requested by the Government from experts, only one was not against this transfer.

The National Water Council passed the draft bill despite the votes of all of the scientists against it but, finally, the project was approved by the Congress of Deputies (Parliament) on 31/04/2001 and by the Senate on 20/06/2001; furthermore, despite lacking social consensus, being full of scientific and technical errors, lacking a water administration in accordance with the new necessities of water politics and the European Water Framework Directive, was definitively financially unfeasible due to the corresponding European funds being unavailable. But the biggest error was, in reality, that there was merely a technical project for a water transfer rather than the constitution of a true National Hydrological Plan.

Paradoxically, this water transfer project, which was not carried out, brought about the social mobilisations against it and the large number of documents drawn up by scientists from Spain and other European countries, who collaborated in creating a *New Water Culture* in the Spanish Mediterranean and, from this point, nothing has been the same between us in matters relating to water, above all in the intellectual plane but also to a lesser extent in practice.

The number of studies, books, scientific articles etc. that were created in relation to this transfer was immense. In fact, although solid research and dissemination works have been published since then, in reality the aforementioned studies comprised the intellectual foundation in regards to matters of Economics and Public Management which today is known in the south of Europe as the New Water Culture.

Finally, the Plenary Session of the Congress of Deputies passed the Draft Bill to Modify the law on the National Hydrological Plan (PHN) of 2001, and the repealing of the Ebro to Almería water transfer, with 188 votes in favour, 135 against from the PP and three abstentions.

The concept of general interest relating to a large hydraulic works such as the Ebro-Almería water transfer project was difficult to maintain when the same political persuasions in the regional governments paradoxically held contrary positions, be they in the transferring or receiving region. In this specific case, the regional authorities of Aragón (PSOE) and Murcia (PSOE) held opposing stances in regards to the convenience of constructing the water transfer.

In summary, this is the case of a transfer that in the face of the expectations of the arrival of new quantities of water to the peninsular south east, it brought with it expectations of business and corresponding investment and the exploitation of new irrigation that, had the transfer been built, it would not have been possible to satisfy; that is, the supposed water deficit of the peninsular south east shot up

without it even having entered into service, causing with its mere announcement more problems than those it supposedly attempted to solve.

B) THE TAJO SEGURA WATER TRANSFER

The Tajo-Segura water transfer is one of the hydraulic works to most capture the attention of water academics in the Iberian Peninsula, linking the Tajo and Segura river basins via a 292 km long canal. It commences next to the Bolarque reservoir, located between the provinces of Cuenca and Guadalajara, and ends following a number of phases and infrastructures in the Azud de Ojós reservoir in the province of Murcia.

It irrigates land in Alicante, Murcia and Almería, and the supervision of the exploitation regime of this water transfer is undertaken by the Central Commission for the Exploitation of the Tajo-Segura Aqueduct.

The works began in 1969 but the waters did not reach the River Segura until ten years later due to the complexity of the route, the numerous facilities required, errors in the design and execution, landslides and other unforeseen circumstances, etc. which, furthermore, meant that the initial budget for the works, 13.6 billion pesetas (approx. 82 million euros) tripled in size.

The predicted quantity of water to be transferred was 1,000 hm^3 annually whereas the true quantity of water transferred stands at 263 hm^3 annually; as a result, once more, far from solving the initial irrigation deficit in Murcia, it has increased it.

The new Tajo Hydrological Plan, 2022-2027 (BOE 2023), supported by over five Supreme Court judgments relating to ecological flows, would suppose a serious reduction in the water transferred by these works. In particular, via its passing through Aranjuez (Madrid) the ecological flow goes from the current six to seven cubic metres per second from 1 January 2023 to eight from 2026 and rises to 8.65 in 2027.

It goes without saying that tensions between the people and institutions of the transferring and receiving zone, both private entities and irrigator organisations and the regional administrations themselves, have risen.

However, allow me to make the following observation, with scientific support, that reveals a devastating corollary for traditional *hydropolitics*: If in the ten years that the project of this water transfer lasted the requirements of the users were reduced to half, it is possible that a moratorium on the construction of many of the planned hydraulic works would have reduced the urgent needs of water to the same extent.

The voraciousness of the plastic-covered irrigation in Murcia and Almeria enjoy great private profitability, to which they would need a practically infinite quantity of water; moreover, every time a water transfer is made or new contributions of water are made to these regions, there is a rise in profit expectations and as a result, new appetites for water.

Mention has already been made of the currently paralyzed Ebro-Almeria water transfer, the current, conflictive and recently reduced Tajo-Segura transfer, and the River Castril to Baza-Almería transfer and presently under construction is

the Negraín-Almanzora transfer, all with significant social opposition, whereas in contrast there is a clamour for transfers from Rules-Almería and Minas de Alquife-Almería, The latter three transfers originating in the province of Granada.

C) THE FRAUD OF URGENT WORKS - THE RIVER CASTRIL TRANSFER[1]

One of the most used frauds to carry out large hydraulic works, thus avoiding the large majority of the environmental type controls is the so-called urgent proceedings, the use of which is justified to provide an *urgent solution to the water supply problem.*

The construction work for the River Castril Baza and Almería water transfer was projected in the year 2008 as *emergency works*. In any case, the dry phase of the last cycle ended. It was followed by four years considered even by the Administration as extremely wet, with the winter of 2012 and spring of 2013 seeing the most rainfall in the last 34 hydrological years. Put another way, if there was no longer really any urgency in 2008 to carry out the River Castril water transfer, today it would constitute a true public abomination.

[1]I have had the opportunity to act as a legal expert presenting numerous reports for various legal proceedings which have for the time being paralysed these works, the links of which I have included for further information.

A) WRITTEN AT REQUEST OF CASTRIL DE LA PEÑA COUNCIL.

https://altiplanogranada.org/wp-content/uploads/2020/10/ESTUDIO-Elementos-razonamientos-ecologicos-economicos-sociales-obras-ri%CC%81o-Castril.pdf

https://altiplanogranada.org/wp-content/uploads/2020/10/ESTUDIO-Reserva-embalse-del-Portillo

The construction of the River Castril to Baza and Almería water transfer was projected in 2008 as urgent works. In 2023 these works have still not been carried out.

B) WRITTEN AT THE REQUEST OF CORTES DE BAZA COUNCIL.

- "The Unsustainable Economics of the River Castril".
- The River Castril Water Transfer and the Water Politics of the Northern Zone of the Province of Granada. Document created for the European Union Parliament. 8 pages.
- Construction of Supply Flow to Baza from the Portillo Reservoir (The River Castril Water Transfer) (General draft document of the problem) 314 pages, 16 graphics, 12 figures and 9 tables.
- Monetary assessment of the different damages that will be occasioned in the River Castril valley as a result of the completion of the Project for the Transfer of Water from the Portillo Reservoir to Baza. 12 pages. 8 pages.
- Report on the problem of the River Castril for the lawyer José Jiménez Gasquet, with the purpose of studying and, where appropriate, taking the necessary legal action to paralyse it and, where necessary, prohibit the carrying out of emergency works approved by the Cabinet on 15/12/06. 7 pages.
- Summary Report on the State of the Matter of the River Castril Transfer for the newspaper El Mundo (Mr Cano). 8 pages.
- Study on the Environmental Impact of the Project for the Supply Flow to Baza from the Portillo Reservoir (River Castril Water Transfer) (Summary document). Document written for presentation before the National High Court. 87 pages, 12 figures, 3 graphics and 7 tables.
- Comments on the Technical-environmental report on the request for a precautionary measure for the suspension or paralysing of the emergency works to supply Baza. Document written for presentation before the National High Court. 17 pages.
- The River Castril Water Transfer (summary document). Is the River Castril water transfer urgent? Document created for presentation before Administrative Court No. 4 of Granade.

There is no evidence to suggest that the streets of Baza and Almería are the scene of public demonstrations demanding water for their basic needs, or that the economic activities in these towns have suffered a crash that has led to mass emigrations of the population. In summary, to catalogue these works as urgent was highly inappropriate, and did not in any way correspond to the general interest of the population.

The footnote attached contains a list of the large proportion of these studies and even two of the most important have a reading link available.

Amongst others, *Is the River Castril water transfer urgent?* describes the fallacy of the cataloguing of these hydraulic works as an emergency because, in reality, no decisive need exists for their execution; rather, the promoters are solely attempting to evade the environmental controls and other regulations that demand compliance from these types of construction.

"The Hydrological Plan for the Guadalquivir and the Portillo Reservoir Reserve for Supplying Baza, Caniles and Freila" reveals the deceit of the official diagnosis that justifies the water transfer, followed by the falsehood of the apparent objectivity of the project: There is an attempt to justify the works with a false need for water for the urban supply to the town of Baza, when it does not exist, and in reality the destination of the transfer would be the lands and greenhouses of Almería.

D) THE MINAS DE ALQUIFE-ALMERIA WATER TRANSFER

The former Minas de Alquife were an open cast iron ore mining exploitation, and there is currently a project funded by foreign capital to reopen the mines, which lie over an aquifer, to which in order to extract the iron ore it is necessary to proceed to permanently extract large quantities of water (Figure 3) that, of course, have candidates in Almería via a transfer.

Figure 3. *The Promised Minas De Alquife-Almeria Water Transfer*

Source: own creation.

I also have the opportunity of appearing in the corresponding legal proceedings against the water transfer, providing an expert legal report, which is available for reference (Castillo 2023).

Virtual Water Exports

The previous diagnosis was summarized in that the water deficiencies suffered by Mediterranean European countries in the recent past have mainly been due to developed economic models, which lack planning.

These models have been based on production specializing in economic activities that consume large quantities of water when, paradoxically, due to the natural conditions of these regions, which on the whole have less runoff and lower rainfall, the availability of this resource is lower than in their Northern European equivalents.

This nonsense means that water in Mediterranean Europe, being a strategic factor for its economy, has a greater relative scarcity that represents a limiting factor for its development and reveals, ultimately, the economic and environmental unsustainability of its management model.

Regardless, a recently initiated line of research comes to confirm the previous diagnosis but, most importantly, it opens new channels for cushioning the aforementioned difficulties, different of course to the traditional politics of supply, so costly in monetary and environmental terms; rather, they constitute a new perspective that was previously scarcely explored for the politics of demand. It involves the study of the business of the virtual water of countries and regions.

Virtual water is the quantity of this resource used to create a specific product (Table 3). It is attributed mainly to John Anthony Allan (1937-2021) (Allan 1997), a British geographer who was awarded the Stockholm Water Prize in 2008 for his scientific contribution of the concept of virtual water, as it seems he was the first to create and articulate it.

Table 3. *Virtual Water Content of Selected Products (m^3/Tm)*

Product	USA	India	Brazil	Mexico	Italy	Netherlands	Global average
Milk	695	1,369	1,001	2,382	861	641	990
Maize	489	1,937	1,18	1,744	530	408	909
Sugar cane	103	159	155	171			175
Coffee (roasted)	5,79	14,5		33,475			20,682
Coffee (green)	4,864	12,18		28,119			17,373
Leather (bovine)	14,19	17,71	18,222	40,482	22,724	12,572	16,656
Beef	13,193	16,482		37,762	21,167	11,681	15,497
Tea (made)		7,002					9,205
Cotton lint	5,733	18,694	6,281	4,812			8,242
Sheep meat	5,977	6,692		16,878	7,572	5,298	6,143
Cheese	3,457	6,793	4,969	11,805	4,278	3,19	4,914
Pork	3,946	4,397		6,559	6,377	3,79	4,856
Milk powder	3,234	6,368	4,654	11,077	4,005	2,982	4,602
Millet	2,143	3,269		4,534			4,596
Goat meat	3,082	5,187		10,252	4,18	2,791	4,043
Chicken meat	2,389	7,736		5,013	2,198	2,222	3,918
Cotton seed	2,535	8,264	2,777	2,127			3,644
Rice (broken)	1,903	4,254	4,6	3,257	2,506		3,419
Eggs	1,51	7,531		4,277	1,389	1,404	3,34
Rice (husked)	1,656	3,702	4,003	2,834	2,18		2,975
Sorghum	782	4,053		1,212	582		2,853

Coconuts		2,255		1,954			2,545
Rice	1,275	2,85	3,082	2,182	1,679		2,291
Soybeans	1,869	4,124	1,076	3,177	1,506		1,789
Barley	702	1,966	1,373	2,12	1,822	718	1,388
Wheat	849	1,654	1,616	1,066	2,421	619	1,334
Rice	1,275	2,85	3,082	2,182	1,679		2,291
Rice (husked)	1,656	3,702	4,003	2,834	2,18		2,975
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Cheese	3,457	6,793	4,969	11,805	4,278	3,19	4,914
Leather (bovine)	14,19	17,71	18,222	40,482	22,724	12,572	16,656

Source: Allan 1997.

But in reality the first time this study perspective was disclosed in Spain thanks to Manuel Ramón Llamas Madurga, Senior Lecturer in Geology and academic member of the Royal Academy of Exact, Physical and Natural Sciences and the Royal Academy of Doctors of Spain.

Ramón Llamas made the Inaugural Speech of the academic year on 2 November 2005 on the topic *The colours of water, virtual water and hydraulic conflicts* (Llamas Madurga 2005). Professor Llamas estimated the quantities of water needed to produce specific quantities of agricultural, livestock and industrial products in Spain. Compare in the Table 4, for example, that to produce a slice of bread you need 40 litres of water, whereas one kg of beef consumes 15,000 litres.

Table 4. *Virtual Water in Selected Products in Andalusia*

QUANTITIES OF WATER USED IN THE PRODUCTION OF SELECTED PRODUCTS (litres)	
Bottle of beer (250ml)	75
Glass of milk (200ml)	200
Slice of bread (30gr)	40
Cotton t-shirt (500gr)	4100
Sheet of A4 paper	10
Hamburger (150gr)	2400
Pair of cow leather shoes	8000
Beef (1kg)	15000
Sheep meat (1kg)	1000
Chicken meat (1kg)	6000
Cereal (1kg)	15000
Palm oil (1kg)	2000
Citrus fruits (1kg)	1000

Source: Llamas Madurga (2005) and own creation.

It is easily deducible that there is a constant production of (virtual) water transfers from the exporting regions and countries to the importers of selected products and the logical correlation of this approach is, of course, that from this perspective those countries and regions with greater relative scarcity of water resources are interested in specialising in the production and exportation of goods that require reduced water consumption and, in contrast, in importing those products whose input requires large quantities of water.

Therefore, without taking other conditioning factors or objectives into consideration, a highly influential instrument for reducing the incorrectly named water deficit is to resort to the balance of virtual water imports and exports in a specific zone.

Table 5. *Virtual Water Imports and Exports via Selected Agricultural Products (Millions m^3)*

Product	Imported virtual water	Exported virtual water	Net virtual water
Cereal	1,960,370	2,905,434	905,064
Herbaceous	68,069	730,705	662,646
Fruits and citrus	80,151	32,207	47,994
Olive and vineyard	8,217	454	7,763
Potatoes and Veget	105,862	15,082	90,780

Source: Navarro and Madrid (2007), Madrid and Velazquez (2008), Velazquez (2008) and own creation.

If the average imports and exports of a number of agricultural products are analyzed it can be concluded that in Andalusia (Table 5) large quantities of water are being used for crop growing and subsequent sale outside the region of products that produce low economic returns but, above all, are large consumers of water. Therefore, large water savings could be obtained reducing exports of such products, where improvement in efficiency implies costs in regards to facilities that are probably intolerable for these productions.

In a first approximation, in the agricultural sector considerable costs could be favoured as regards water consumption in Andalusia by reducing, in this order, exports of wheat, peas, rice and some fruits, mainly those with low water use efficiency.

If "*There Were Few Of Us* Now…..": Climate Change

If a large number of the concepts used by traditional *hydropolitics*, indicated above, such as *excess water, water deficit, we'll definitively solve the problem with works, dry Spain and wet Spain, throwing water into the sea* etc. lack scientific rigour, these deficiencies are spurred on in the presence of the climate change that will be more evident in the zones of the Mediterranean regions (IPPC 2021, WWF 2023).

In fact, the two most important economic activities in the regions of the Mediterranean Sea, tourism and agriculture, will have to undergo substantial changes.

In the case of tourism, the pleasant temperatures that are today one of the main attractions will, following their predicted increase, begin to stop being so.

For their part, the increase in temperatures, greater water needs for plants and livestock, scarcer and torrential rainfall, that is, there are changes in the climatic conditions, water availability and needs for the plantations to which the majority of the hydraulic works carried out previously, without a cost-benefit analysis in social terms, are today clearly useless.

The last report by the Intergovernmental Panel on Climate Change (IPCC) predicted a reduction in water provision in the Mediterranean basin by 2050 of between 4% and 8%, a risk that will be inevitable.

Therefore, in countries with Mediterranean climates, which include Spain, will be one of the agricultural zones of continental Europe most vulnerable to climate change: the reduction of rainfall, the increase in the intensity of droughts and heatwaves, the scarcity but torrential nature of rainfall, the low flow of rivers, etc. shall affect irrigation crops extremely negatively.

In short, agricultural productivity in the Mediterranean region could fall by 17% by the year 2050 due to climate change if a high level of CO_2 levels is maintained, and take into account that south east Spain is currently the main supplier of vegetables and pulses to the greater part of central and northern Europe (IPCC 2021).

Conclusions: The New Water Culture from the South or *Let the Water You Cannot Drink Flow by*

The majority of the numerous opinion surveys undertaken destined towards discovering the attitudes of southern Europeans reveal that an increasing percentage of the population is concerned about environmental problems and that there is at present a high level of awareness, which could result in greater monetary sacrifices, of course, with the opportune guarantees, but in reality the institutional changes that facilitate the transfer of attitudes to practical behaviours have not yet taken place.

Partial or insufficient measures can only serve to justify the appearance of an extremely recent and assigned ecologist vocation in a number of national and regional administrations, when it is not simply to formally comply with demands from other institutions but, in reality, will only collaborate in wasting the capital that supposes the real and positive social attitude in this regard.

The new Administration must be equipped with sufficient and appropriate legal, technical and human means to achieve the new general interest. In this case, in order for credibility to be given to the legislative changes that have occurred and others that are announced and the financial implications thereof. Otherwise, in all likelihood once again the goal will have been sacrificed due to the absence of means.

It must be strongly demanded of public powers that the real water needs of the population be harmonised with its conservation and that of the associated ecosystems (rivers, lakes, wetlands, etc.), seriously deteriorated by the lack of government that has presided over traditional *hydropolitics*. Not forgetting, of course, that the fact that the economic function now carried out by water is highly important, it and other natural resources form the basis of life and, paradoxically, also the basis of the financial system, whose future has been seriously affected by the deterioration caused to the former. In other words, if for some people the ethical and aesthetic arguments, among others, are insufficient to convince them of the need to conserve and improve the quality of natural resources, it is likely that the unsustainability of the economic profit of this development model will.

Particularly, from the Administration, there is an attempt by economic interest groups and other subjects with media impact to provide a semantic solution, rather mask, the manifested conflict between conventional growth and quality of natural water resources, simply through the use of expressions such as sustainable and solid growth and development, etc., with which the appearance is given of restoring social harmony and, therefore, everyone is satisfied, but in reality the main conflict is avoided, such are the limits of growth, above all those associated with the current economic model.

The inclusion of environmental factors such as water in social analyses means that the terms sustainable, solid, applied to growth, development etc. remain theoretical. This is because either it means true progress, that is, human and not just private business improvements, or reveals that we are not moving in quicksand or, in this case, in dry and polluted rivers, aquifers, lakes and wetlands.

The traditional *hydropolitics* developed in the large majority of the European countries that border the Mediterranean Sea is supported by a mistaken diagnosis and a series of correlative conceptual falsehoods used by the administration and even by the people who protect it.

But these errors are not innocent. It logically corresponds that is necessary to build a hydraulic works, with which for the moment the social discontent diminishes but in reality it will not solve the problem, rather surely make it bigger, for it is not explained who is going to pay for this construction and the only thing for sure is that the politician who is promoting the works and the construction company will profit in the short term. *Will the last one to leave please turn out the light and lock the door*.

In the majority of the countries in the Mediterranean there are no economic and social water accounts, despite constituting the main production factor for all economies and, above all, being an essential element for life.

The absence of a price of water that reflects on the one hand production costs (supply) and on the other the availability upon payment by users (demand) makes it difficult to manage the concept of water economic scarcity, but not physical scarcity because in reality everything is limited.

The prices effectively paid by domestic water users, with small subsidies in some countries, approximately reflect the public cost of supply, but this is not the case for the prices paid by farmers who enjoy in some cases subsidies close to 90% of supply costs. There is thus in this way a regressive effect due to the transfers of income between the majority of citizens and powerful landowners.

Inland, the lack of a realistic price of water is the reason for its inefficient usage and even the mere existence of crops that are not socially profitable.

The pollution of continental water due to urban uses increases the problem of water scarcity as it does not provide the qualities necessary for different uses and, furthermore, causes enormous ecological problems in the Mediterranean, above all due to plastic, as it is a sea that is practically enclosed.

Water transfers are some of the most controversial hydraulic works, being the cause of important and prolonged social conflicts. The construction of these works is normally based on erroneous diagnoses such as being *urgent* because the situation is critical, there is a zone where there is a water surplus and another where there is a deficit, and if the transfer is built and finished the problem will be definitively solved.

The virtual water approach reveals a permanent (virtual) water transfer from exporting regions and countries to importers of goods. Therefore, when planning water policy this circumstance must be taken into account and attention be drawn to the incoherence of certain *dry* regions claiming quantities of surface water arguing the existence of a *deficit* to then export products created with the water in question that generally lack added value.

The European countries with Mediterranean climates will comprise the agricultural zones of continental Europe that are most vulnerable to climate change: the transfer of the population from the north to the south, the reduction of precipitation, the increase in the intensity of droughts, the scarcity but torrential nature of rainfall, the reduction of river flow, etc. will have a very negative affect

on irrigation crops in favour of regions in the north that previously had colder climates.

To summarise, *let the water you cannot drink flow by*.

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