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ARTICLE

European Union Regulation of Water Stress Risks

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Abstract

Water stress is a growing concern in Europe, partly due to the changing climate context. Despite the cross-cutting impacts that water availability has on different areas under the competence of the European Union (EU), there is not currently a comprehensive and systematic legal framework addressing this issue. The purpose of this article is therefore to examine the EU legislation that concerns the measures aimed at mitigating these risks. To this purpose, it is first examined how droughts and water scarcity are framed within EU legal acts. Based on such an overview, the analysis is directed to the mechanisms developed at the EU level for monitoring, identifying and forecasting water stress risks, as well as the legal provisions relating to the planning tools. The remainder of the article is devoted to the regulation of preventative measures for water scarcity and drought risk reduction, following the water hierarchy resulting from COM(2007) 414.

Keywords: Drought; risk regulation; water scarcity

I. Introduction

The picture of a fifty-metre cargo boat dating back to the World War II period emerging from the Po River during the 2022 spring season incisively gives prominence to a natural hazard that is increasingly impacting the Old Continent. Within this context, during 2022, many European regions were significantly affected by a lack of precipitation combined with a sequence of heatwaves. In this sense, based on the August 2022 report of the Joint Research Centre,[1] the last Combined Drought Indicator pointed to 47% of Europe being under warning conditions and 17% under alert conditions. As a consequence of this, several dimensions of human life have been negatively impacted, including inter alia the energy sector and the crop yields. However, such a disaster cannot be identified as a contingency, considering the frequency of its occurrence over the last three decades. Furthermore, in accordance with climate change projections, the frequency and severity of droughts are expected to increase, especially in southern Europe.[2]

Within this context, a considerable number of legal aspects are involved in droughts and water scarcity risk management. In this regard, the law cannot make rain, but it could help mitigate drought impacts – for instance, through the definition of a water allocation

[1] A Toreti et al, "Drought in Europe August" (Luxembourg, Publications Office of the European Union 2022) doi: 10.2760/264241, JRC130493.

[2] EEA, "Water resources across Europe – confronting water stress: an updated assessment (Report No 12/2021) doi: 10.2800/320975.

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regime that might encourage the efficient use of water.[3] In that sense, legal regimes are also demanded to resolve the conflicts between competing uses of water.[4] Moreover, among the different legal aspects hereby implicated, the definition of a clear legal framework concerning the water supply side constitutes a relevant part of risk reduction, which also involves the qualitative aspects of water regulation.

The current repercussions of drought and water scarcity, as well as the foreseen risk scenarios, prompt us to examine the adequacy of the current European Union (EU) regulatory framework on this topic, given the wide-ranging impacts of water availability on the different areas under EU competence. Unlike flood risks, which have been regulated through a comprehensive approach by EU institutions, water stress governance still appears to be particularly fragmented, resulting from an unclear compound of primary law restraints, binding Regulation and Directive provisions and optimistic strategies within soft law acts. Given such a fuzzy framework, the aim of this article is primarily to improve our understanding of how water stress risks are framed within the EU legal system by examining in which terms such risks are identified by EU legal acts on this topic (Section II).

Against the backdrop of the European conception of water stress that results from this analysis, an examination of the current regulation on this risk area is carried out. The objective of this analysis is to examine the current status of the EU legislation on this topic by comparing it with the pathway that was defined by the European Commission in the 2007 Communication "Addressing the challenge of water scarcity and droughts in the European Union".[5] Therefore, within the development of this analysis, we will seek to understand whether the EU legislature is taking further steps with regard to the regulation of a phenomenon traditionally excluded from its areas of regulation, whose risk components are changing. Primarily, within this research, the mechanisms developed at the EU level for monitoring, detecting and forecasting water stress risks and the legal provisions related to the planning tools for managing such risks are briefly examined (Section III).

After examining the legal aspects of these prerequisite processes for prevention activities, the remainder of this article is devoted to analysing the legislation on the prevention measures for water scarcity and drought risk reduction by following the water hierarchy resulting from the mentioned Commission Communication of 2007. Consequently, the examination is first focused on the EU regulation related to the measures aimed to enhance water efficiency (Section IV), as it has been included among the sets of solutions to respond to the common concern related to the increase and widening spread of water stress cases. In this regard, the analysis is directed towards water pricing policies, as they constitute one of the first categories of preventative measures within the water hierarchy, by investigating whether any legal base for the adoption of a pricing approach that might contribute to more effective and sustainable water demand management is provided within the EU legal framework. Moreover, it is examined whether any further steps have been taken towards the definition of eco-design requirements, criteria and ratings of water-using goods that might incentivise the spread of products that ensure water savings within the EU legislation. Within the context of water efficiency policies, particular attention is devoted to the agricultural sector, given its dependence on

[3] In this regard, see: AD Tarlock, "Water allocation and management during drought" in A Rieu-Clarke, A Allan and S Hendry (eds), *Routledge Handbook of Water Law and Policy* (London, Routledge 2017) pp 149ff; RK Craig, "Water law and climate disasters" in R Lyster and RR Verchick (eds). *Research Handbook on Climate Disaster Law: Barriers and Opportunities* (Cheltenham, Edward Elgar Publishing 2018) pp 254ff.

[4] RW Adler, "Climate change adaptation and agricultural and forestry law" in J Verschuuren (eds), *Research Handbook on Climate Change Adaptation Law* (Cheltenham, Edward Elgar Publishing 2013) pp 214–49.

[5] COM(2007) 414 final.

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water availability, by taking into particular account the new provisions in this matter under the Common Agricultural Policy (CAP; Section IV.I). Section V provides an analysis of EU legislation concerning the development of additional water supply infrastructure and solutions as residual preventative measures to be implemented coherently with the strategic pathway defined under the Commission's Communication of 2007. In this regard, the object of the analysis is the EU regulatory framework concerning inter-basin water transfers, wastewater reuse and desalinisation plants.

II. Drought and water scarcity within the European Union legal framework: preliminary remarks

As has been pointed out, water was an early arrival on the EU policy agenda since the first Environmental Action Programme in 1973, within which the Community action was directed towards setting out a number of measures in order to pursue quality objectives.[6] Coherent with such a programmatic line, between 1975 and 1980, several Directives were approved to set out a common legal framework to guarantee the quality protection of this resource.[7]

Within this legal context, water was identified as a resource to be protected from pollution and deterioration as a result of environmental and public health protection common policy.[8] In fact, the necessity for the definition of quality standards of water arose from a wider and more integrated perspective of the EU legislature, in accordance with which water has a direct influence on the whole mechanistic functioning of the EU. The EU legislature appeared to be aware of the implications of a disparity in quality water regulation among Member States regarding competition conditions and the common market more generally. Based on such an assumption, these Directives were therefore approved through the invocation of Article 235 of the Treaty Establishing the European Economic Community.

Despite the aforementioned directives and the following legal acts[9] positively contributing to building a European water policy, the regulation was particularly fragmented as each legal act was designed to regulate this subject based on a specific type of water use or kind of pollution source.[10] Such regulatory fragmentation was partially overcome with the approval of the Water Framework Directive 2000/60/EC (WFD). The WFD represents a valuable example of integrated water resource management on the basis of a "holistic and adaptive approach".[11] In more detail, the Directive establishes common

[6] For an analysis of the evolution of European water legislation, see M Van Rijswijk, "Europe" in JW Dellapenna and J Gupta (eds), *Water Law* (Cheltenham, Edward Elgar Publishing 2021) pp 240 ff.

[7] In more detail, during that timeframe, approval was given to Council Directive 75/440/EEC of 16 June 1975 concerning the quality required of surface water intended for the abstraction of drinking water in the Member States, the Council Directive 76/160/EEC of 8 December 1975 concerning the quality of bathing water, and the Council Directive 80/778/EEC of 15 July 1980 relating to the quality of water intended for human consumption.

[8] In particular, in this regard, see the recitals of Council Directive 75/440/EEC and of Council Directive 76/160/EEC.

[9] For an overview of the EU legislation on water before the approval of Directive 2000/60/EC, see the recitals of the same Directive.

[10] S De Vido, "Il diritto all'acqua nella prospettiva europea" in L Violini and B Randazzo (eds), *Il Diritto all'acqua* (Milan, Giuffrè 2017) p 177.

[11] In this regard, see M van Rijswick and A Keessen, "The EU Approach for Integrated Water Resource Management: Transposing the EU Water Framework Directive within a National Context – Key Insights from Experience" in A Clarke, A Allan and S Hendry (eds), *Routledge Handbook of Water Law and Policy* (London, Routledge 2017) pp 51–64, which underlined how the identification of the EU water regulatory system as a holistic system rather than a bundle of individual requirements has also been acknowledged by the European Court of Justice in Case C-461/13 *Bund v Germany*. In more detail, it has been pointed out that different provisions cannot be understood properly in isolation but should be interpreted within the whole WFD, on the basis of which a modern system of water law has been built up where needs for flexibility, policy discretion and subsidiarity, as well as for the ongoing improvement and effective protection of Europe's water, are combined.

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principles and an overall framework for water protection, coherent with the identification of the latter as a heritage to be protected rather than a commercial product.[12] Moreover, the WFD coordinates, integrates and develops the overall principles for the protection and sustainable use of water within the EU.[13] Within this context, as pointed out by the Court of Justice of the European Union, the ultimate goal of the Directive seems to be the achievement of a "good status" for the European Union's surface waters and groundwaters.

On the basis of the Directive recitals, a solid awareness emerges regarding the existing interrelations among the quantitative and qualitative dimensions of water protection. Such an interrelation is specifically recognized with regard to groundwater as it is acknowledged that its quantitative status may have an impact on the ecological quality of surface water, as well as associated ecosystems.[14] By contrast, surface water quantity is conspicuously kept under the umbrella of a regulatory grey zone.[15] Therefore, from an overall perspective, within the WFD the quantitative aspects of water protection are ancillary to water quality, despite there being such an intrinsic interrelation.

With specific regard to drought as an element of water stress, the mitigation of the effects of droughts is explicitly included among the objectives of the Directive.[16] However, the Directive neither provides a definition of such a natural hazard by distinguishing it from water scarcity nor addresses such risks. More specifically, the Directive simply refers to droughts as an element under which the pursuit of environmental objectives (eg Article 4) could be derogated.[17]

A forward step with regard to this topic was taken with a Commission's communication to the European Parliament and the Council in 2007, which paved the way for a wide-ranging debate on how to adapt to water stress.[18] Within this document, a definition of the phenomena is first provided. While "drought" is identified as a temporary decrease in water availability due, for instance, to rainfall deficiency, "water scarcity" refers to the condition where water demand exceeds the water resources exploitable under sustainable conditions.

As accurately pointed out by the Commission, both phenomena may severely impact the daily lives of human beings, as well as several economic sectors, such as agriculture, tourism, industry, energy and transport. In fact, despite their spatially differentiated occurrence, droughts and water scarcity are considered to be concerns that might affect the entire EU and its functioning, given its competencies in the aforementioned economic sectors. On the basis of such an assumption, droughts and water scarcity are therefore not only qualified as "essential environmental issues", but also as challenges to be addressed for sustainable economic growth in Europe, particularly due to the increase of the risks of these phenomena caused by the effects of climate change. Therefore, within the 2007 Commission Communication, a set of policy options was proposed to respond to such challenges, which will be analysed in the following sections by verifying their state of implementation.

The identification of droughts and water scarcity risks as common concerns was reaffirmed later on in the 2012 "Report on the Review of the European Water Scarcity and Droughts Policy".[19] Within the context of a critical evaluation of policy implementation,

[12] Recital 1 of Directive 2000/60/EC.

[13] See Case C-525/12 *European Commission v Federal Republic of Germany*, para 50.

[14] Recital 20 of Directive 2000/60/EC.

[15] G Baranyai, *European Water Law and Hydropolitics* (New York, Springer International Publishing 2017) p 98.

[16] Art 1, lett e) of Directive 2000/60/EC.

[17] In accordance with Art 4, para 6 of Directive 2000/60/EC, temporary deterioration in the status of bodies of water shall not be in breach of WFD requirements if this results from exceptional and unforeseeable circumstances of natural cause, including prolonged droughts.

[18] COM(2007) 414 final.

[19] COM(2012) 672 final.

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these hazardous phenomena have indeed been qualified as potential sources of economic losses in several water-using sectors and as having environmental impacts on a number of areas, including inter alia water quality. Therefore, the strict interconnection between water quantity and water quality has been recognized again.

More recently, within the new EU Strategy on Adaptation to Climate Change, the issue of droughts has been included among the climate change impacts that the EU has to cope with. Besides the confirmation of the definition of this phenomenon,[20] the Commission underlined the capacity for a cascading effect of such a risk. As specified in more detail, drought events reduce water levels, stunt tree growth and crop yield and increase pest attacks and wildfires. These outcomes mainly affect the agriculture, energy and the public water supply sectors. On the basis of these aspects and the acknowledged impacts of climate change on these risks, the Commission acknowledged the necessity to adopt technical and organisational adaptation solutions in order to respond to the future common exposure to this risk across all river basins.

Previous scholarly analyses concerning water scarcity and drought risks have pointed out several weaknesses and gaps in the EU's policies and the related legal framework on this topic.[21] Moving from the conception of droughts and water scarcity considered herein, the following section are therefore directed at examining whether and how the risks associated with such phenomena have been regulated within the EU legal system by comparing it with the 2007 Commission Communication strategic pathway. Against the background of a partially renovated legal framework and the acknowledged impacts of climate change on variability to such risks, in the next sections, we will also seek to understand whether and how the EU legislation has evolved in order to adapt to the changes in such an area of regulation and which specific aspects might be in need of common European regulation in order to establish a better risk management framework.

III. Drought and water scarcity risk forecasting and planning under European Union law

With regard to the monitoring, detection and forecasting of drought risk, EU measures have been developed coherently with the aforementioned 2007 Commission Communication. In fact, an observatory for drought risk has been set up as part of the

[20] Droughts are defined as unusual and temporary deficits in water availability. Compared to the Commission's 2007 Communication definition, it is also specified that these deficits might concern atmospheric water, surface water or groundwater.

[21] G Rossi, "European Union policy for improving drought preparedness and mitigation" (2017) 34(4) Water International 441. In more detail, it has been pointed out that significant weaknesses are related to several provisions of the WFD, including inter alia: the identification of water quantity controls as ancillary elements; the fact that the assessment of quantitative status is not required for surface water bodies; the inclusion of water demand management measures, including efficiency and reuse measures, among the "supplementary measures" in areas affected by drought in the programme of measures of the river basin management plan; the lack of a definition of water shortages due to droughts; and the ambiguous way with which the impacts of droughts on natural water bodies are faced. Further weaknesses have also been ascertained with regard to the EU's "technical tools", given the absence of an evaluation of the efficiency of different sets of quantitative measures, as well as the deficiencies concerning the indicators for measuring water stress. Moreover, critical remarks have also been directed to the financial instruments, highlighting that drought and water shortage issues were not adequately dealt with, particularly in the Common Agricultural Policy and the related funds' destinations. For other critical remarks on this topic, see E Kampragou, S Apostolaki, E Manoli, J Froebrich, and D Assimacopoulos, "Towards the harmonization of water-related policies for managing drought risks across the EU" (2011) 14(7) Environmental Science & Policy 815. In general, these authors observed that despite overall efforts and progress made, important gaps remain in the horizontal integration of such an issue with other sectoral and environmental policies, despite it being acknowledged that such an integration would effectively assist in reducing the vulnerability of sensitive sectors and areas.

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Copernicus Emergency Management Service's early warning and monitoring component.[22] In more detail, the European Drought Observatory was developed at the European Commission's Joint Research Centre, and it provides drought information at a European scale through inter alia drought monitoring and forecasting maps, analysis tools and periodical reports.[23]

In line with the new EU Strategy on Adaptation to Climate Change,[24] a new project has recently been launched by the European Commission as a result of the joint contribution of the Directorate-General for Environment and the Directorate-General Joint Research Centre in order to improve drought resilience and adaptation throughout the EU. To this purpose, the European Drought Observatory for Resilience and Adaptation (EDORA) project established a network of drought observatories aimed at encouraging and assisting in the creation and further development of European Drought Observatories services, as well as at promoting knowledge exchange and offering support to drought monitoring, early warning, risk and impact assessments across EU sectors and regions.[25] As a consequence of this, the network could contribute to making drought management and adaptation plans more effective and efficient at mitigating the risks related to such a phenomenon.[26]

Analogously, further steps in this direction have been taken with specific regard to the detection of water scarcity situations, given the introduction of a common indicator that provides information concerning the pressure on the water resources of a certain territory as a consequence of water withdrawals: the Water Exploitation Index Plus (WEI+).[27]

With regard to the purposes herein examined, a contribution might also derive from the proliferation of citizen science initiatives. Regarding citizen science, the literature mainly refers to the non-professional involvement of volunteers in the scientific process, which might consist of data collection as well as quality assurance, data analysis and interpretation, problem definition and results dissemination.[28] In this regard, such a type of civic action influences the governance of environmental issues and contributes to strengthening the provision of public services,[29] also with reference to the water sector.[30]

[22] In accordance with Art 5, para 1, lett e) of Regulation 2014/377/EU of the European Parliament and of the Council of 3 April 2014, the Copernicus Management Service is a component of the Union Earth observation and monitoring programme "Copernicus". The purpose of the service is to provide information for emergency response in relation to different types of disasters, as well as prevention, preparedness, response and recovery activities.

[23] See the details provided at <https://emergency.copernicus.eu/downloads/CEMS_Flyer_DroughtsEDO_2020.pdf>.

[24] COM(2021) 82 final.

[25] Further information with regard to this project is provided at <https://edo.jrc.ec.europa.eu/edora/php/index.php?id=201>.

[26] On the basis of the informal and non-binding provisions of the Terms of Reference (<https://edo.jrc.ec.europa.eu/edora/docs/ToR_Network_of_EU_DOs.pdf>) for the functioning of the network, the organisation and the coordination of the network are led by the Joint Research Centre and by the Directorate-General for Environment, with the aim of ensuring coherence with actions on droughts in the EU.

[27] As specified in H Faergemann, "Update on Water Scarcity and Droughts Indicator Development" in EC Expert Group on Water Scarcity & Droughts (Brussels, European Environment Agency 2012) pp 1–23, the WEI+ results from the total consumption of water divided by renewable freshwater resources, and it contributes to identifying areas that are most prone to suffering recurrent or permanent situations of water scarcity.

[28] In this sense, see the Commission staff working document "Best Practices in Citizen Science for Environmental Monitoring" SWD(2020) 149 final. The definition of "citizen science" is a debated issue. Regarding this aspect, see M Haklay, D Dörler, F Heigl, M Manzoni, S Hecker and K Vohland, "What Is Citizen Science? The Challenges of Definition" in K Vohland et al (eds), *The Science of Citizen Science* (Berlin, Springer 2021) pp 13–33.

[29] A Berti Suman, "Civic monitoring for environmental enforcement. Exploring the potential and use of evidence gathered by lay people" (European Commission Science for Policy Brief, JRC132206, 2023).

[30] Regarding the citizen science initiatives within the water sector, see inter alia DW Walker, M Smigaj and M Tani, "The benefits and negative impacts of citizen science applications to water as experienced by participants and communities" (2021) 8(1) Wiley Interdisciplinary Reviews 1–32, B Pandeya, W Buytaert and C Potter, "Designing citizen science for water and ecosystem services management in data-poor regions: challenges and opportunities" (2021) 3 Current Research in Environmental Sustainability 100059.

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As it results from the analysis of the initiatives in the EU, citizen science is proving its potential to contribute to environmental monitoring and reporting and to policymaking by generating valuable data and knowledge on a wide range of environmental domains, as well as by raising awareness on environmental issues and policies and through public involvement and empowerment; however, the uptake of such data for official monitoring purposes remains limited.[31] Such a critical aspect is connected to the existing legal and governance gaps outlined with regard to environmental information management. In this sense, an interesting solution that has been discussed within the literature is to integrate the Aarhus Convention pillars of environmental democracy. In more detail, in accordance with such a thesis, access to information, public participation and access to justice should be combined with the "right to meaningfully contribute" that should be acknowledged under certain conditions and hypotheses, such as in the case that the matter is not duly monitored or addressed by the competent authorities or the information obligations are not properly complied with by them.[32]

Such a set of initiatives certainly constitutes a further step towards the building of common information assets regarding such risks and information assets designed under the same methodological umbrella, which represent preliminary operations for both the potential definition of a common regulatory framework on this issue at the EU level and consistent management of the risks in question across Member States. However, the EU's contribution to this specific phase of the risk management cycle might be considered moderate if it is compared with flood risk regulation at the EU level. In fact, with the approval of Directive 2007/60/EC, precise obligations on Member States concerning flood risk assessment have been set out. In particular, Member States shall undertake a preliminary flood risk assessment that shall include inter alia: maps of the river basin district, a description of past floods and an assessment of the potential adverse consequences of future floods.[33] Moreover, flood hazard maps and flood risk maps shall be prepared.[34] By contrast, within the drought and water scarcity sectors, no analogous risk analysis is required to be undertaken by the national authority according to EU legislation.

In accordance with the provisions of Directive 2007/60/EC, the mentioned maps resulting from flood hazard and risk analysis constitute the basis on which Member States establish flood risk management plans.[35] With regard to the risks of concern here, no obligation is provided for Member States to adopt a water scarcity and drought risk management plan as an administrative tool aimed to guarantee water availability in sufficient quantities to meet essential human needs, minimise the negative impacts of droughts on water bodies and minimise the negative effects on economic activities.[36] For this purpose, these plans might define the thresholds of possible drought situations and set water constraints to access publicly provided water while guaranteeing priority usage.[37]

[31] This conclusion results from the Commission staff working document "Best Practices in Citizen Science for Environmental Monitoring" SWD(2020) 149 final.

[32] In this sense, see A Berti Suman et al, "When Concerned People Produce Environmental Information: A Need to Re-Think Existing Legal Frameworks and Governance Models?" (2023) 8 Citizen Science: Theory and Practice 10. Such a thesis was previously discussed in A Berti Suman, *Sensing the Risk. A Case for Integrating Citizen Sensing into Risk Governance* (Tilburg, Wolf Legal Publishers and Open Press TiU 2020) p 94; A Berti Suman, "Citizen sensing from a legal standpoint: legitimizing the practice under the Aarhus framework" (2020) 18(1–2) Journal for European Environmental & Planning Law 8–38.

[33] See Art 4 of Directive 2007/60/EC.

[34] See Art 6 of Directive 2007/60/EC.

[35] Art 7 of Directive 2007/60/EC.

[36] See Water Scarcity and Droughts Expert Network, "Drought management plan report: including agricultural, drought indicators and climate change aspects" (Technical report – 2008 Vol. 23 2007).

[37] In this sense, see CM Gómez and CD Pérez Blanco, "Do drought management plans reduce drought risk? A risk assessment model for a Mediterranean river basin" (2012) 76 Ecological Economics 42.

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Table 1. Summary table concerning the legal citations of the various types of measures that are mentioned within Section IV.

Type of measure	Legal citation
Pricing policies	Article 9(1) of the Water Framework Directive (Directive 2000/60/EC)
Ecodesign requirements for water-using products	Directive 2009/125/EC; Proposal for a Regulation establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC (COM(2022) 142 final)
(1) Voluntary and mandatory water performance rating/auditing of buildings; minimum water performance requirements of buildings (2) Voluntary criteria regarding water-saving installations (EU Green Public Procurements)	(1) No legal provisions have been established for this type of measure (2) Section No. B6 of the EU GPP Criteria for Office Building Design, Construction, and Management (SWD(2016) 180 final)
Product information requirements	Article 7, paragraph 2, letter b), page i)–Letter g) of Annex I of the Proposal for a Regulation establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC (COM(2022) 142 final)

EU = European Union; GPP = Green Public Procurements.

A potential legal basis for the establishment of such a plan could be identified in Article 13, paragraph 5 of Directive 2000/60/EC, in accordance with which river basin management plans may be supplemented by more detailed programmes and management plans for sub-basin, sector, issue or water type aimed at dealing with particular aspects of water management. However, due to the optional nature of the adoption of such plans, not every Member State authority in a river basin district has established them.[38]

Coherent with the awareness that droughts and water scarcity have repercussions on the entire European territory even under the hypothesis that their occurrence is circumscribed, a regulatory intervention at the EU level on this topic is desirable, analogous to what is provided under Directive 2007/60/EC. The absence of an obligation for the approval of such a planning tool and of the provision of a relative minimum common content is indeed contradictory with the framing of such risks as phenomena that interest the entire European dimension, as was argued in Section II.

IV. European Union legal framework for water efficiency enhancement

As pointed out in the Blueprint to Safeguard Europe's Water Resources,[39] the sustainable use of Europe's water represents a real challenge for water managers, with special reference to the quantitative aspects of thus. In order to respond to the common concern related to the increase in and widening spread of water stress cases, water efficiency measures have been included among the solutions to be implemented. In fact, the reduction of demand and the improvement of water efficiency constitute key factors in reducing human pressures on water bodies and related ecosystems.[40] See Table 1 for a

[38] Furthermore, as results from the Report from the Commission to the European Parliament and the Council on the implementation of the Water Framework Directive (2000/60/EC) and the Floods Directive (2007/60/EC) (COM(2019) 95 final), only in approximately half of Member States were droughts considered as a relevant feature for water management.

[39] COM(2012) 673 final.

[40] S Mudgal et al, *Water Performance of Buildings* (European Commission/BIO Intelligence Service 2012) p 9.

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summary concerning the legal citations of the various types of measures that are mentioned within this section.

Among the policy measures identified as tools to direct water consumption towards more efficient use, considerable attention was devoted to pricing policies within the 2007 Commission Communication.[41] In more detail, despite the lack of clarity related to the price elasticity of water demand,[42] water pricing is a powerful tool in improving water efficiency through more effective and sustainable water demand management,[43] which has been included among the first preventative solutions within the water hierarchy.[44]

As remarked by the European Commission, in order to implement incentivised pricing for more efficient use of water, consumption should be subject to volumetric charges based on real use.[45] However, such a pricing approach would require widespread metering, which could be an obstacle to the adoption of this method. Beyond this obstacle, given the acknowledged benefits that would accrue from this pricing approach with special regard to the use of water for irrigation,[46] one should first investigate whether any legal basis for the adoption of such a water pricing approach is provided within the EU legal framework.

To this purpose, the analytical lens should be therefore be directed to Article 9 of the WFD. That article sets out provisions that might influence water consumption through informing consumers about the cost of their consumption and informing water users regarding the costs of their activities.[47] However, given the different interpretations of this article and other WFD provisions, the rule was implemented variously among the Member States.[48]

Under Article 9, paragraph 1 of the WFD, two objectives to be achieved by Member States are determined, with different temporal terms of reference. The first sentence of the article took effect in 2003 and foresees that Member States shall take account of the principle of recovery of the costs of water services, including environmental and resource costs, with regard to the analysis conducted in conformity with Annex III of the Directive and in accordance with the "polluter pays" principle. However, the second sentence of Article 9, paragraph 1, sets out that by 2010 Member States shall ensure that adequate incentives for efficient water resources use should be provided through water-pricing policies, thereby contributing to the environmental objectives of this Directive. Moreover, within the same timeframe, Member States shall ensure an adequate contribution of the different water uses to the recovery of the costs of water services based on the economic analysis conducted in conformity with Annex III and by taking into account the "polluter pays" principle. Lastly, Member States in pursuing these objectives may also give regard to the social, environmental and economic effects of the recovery cost, as well as the geographical and climatic conditions of the regions in question.[49]

In reading the article, a number of thorny issues can be identified, including inter alia the extent of application of the rule, given the reference to both water services and water

[41] COM(2007) 414 final.

[42] Regarding this topic, see G Dige et al, "Pricing and non-pricing measures for managing water demand in Europe" (Technical Report No. 3415. Service Contract, 2015).

[43] COM(2021) 970 final.

[44] See the water hierarchy that results from the COM(2007) 414 final.

[45] COM/2015/120 final.

[46] As the European Court of Auditors pointed out within the special report "Sustainable water use in agriculture: CAP funds more likely to promote greater rather than more efficient water use", volumetric pricing might incentivise the shift to water-efficient irrigation technologies and practices or to crops that require less water.

[47] H Unnerstall, "The principle of full cost recovery in the EU-water framework directive – genesis and content" (2007) 19(1) Journal of Environmental Law 29.

[48] European Environment Agency, "Assessment of cost recovery through water pricing" (Publications Office of the European Union, Technical Report No 16/2013).

[49] Regarding the potential of the latter provisions, see W Howarth, "Cost recovery for water services and the polluter pays principle" (2009) 10(4) ERA Forum 565, 573.

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use, the interpretation of the concept of environmental and resource costs, as well as the "polluter pays" principle, with specific regard to the various interpretative approaches that can be distinguished within the literature. As a result of this, the considerable room for interpretations created the conditions for the aforementioned heterogeneity of implementation of the rule by Member States.

With specific regard to the inclusion of the volumetric dimension within water-pricing policies, no specific provisions were set out for such a purpose. In more detail, by taking into consideration the objective to be achieved by Member States by 2010, Article 9, paragraph 1 refers to adequate incentives for ensuring efficient water use, thereby contributing to the Directive's environmental objectives. Certainly, the reference to the concept of efficiency may presuppose the inclusion of a quantitative dimension of water use within water-pricing policies so as to incentivise thrifty use of the resource. However, given the semantic extension of the concept of "efficiency", as well as the room for discretion left by the adjective "adequate",[50] no specific obligation to include quantitative profiles of water use in tariff policies can derive from these provisions. A different conclusion should be drawn with regard to the hypothesis of mutual conditioning of water quantity and quality. In more detail, under the circumstances of excessive usage of the resource having a negative impact on its quality, the tariff policies unrelated to the volumetric dimension would be unlikely to be considered adequate for efficient use consistent with the environmental objectives of the Directive.

The further provisions concerning the targets to be achieved by Member States by 2010 do not seem to offer a legal basis for the aforementioned purposes either. Indeed, under the provisions of Annex III, volume estimates are included in the economic analysis only when necessary, among the factors to be considered in the relevant calculations to take into account the principle of cost recovery for water services under Article 9. Analogously, any legal basis for the herein-mentioned purpose could not be identified within the provisions regarding a Member State's duty of taking into account the "polluter pays" principle in order to ensure an adequate contribution. Indeed, a contrary interpretation of this provision should presume the identification of the mere consumption of water in itself as a form of pollution. Nevertheless, within the EU legal framework, such an interpretation of the principle does not seem to be shared.[51] In conclusion, despite the acknowledgment of the potential of volumetric charges for improving water efficiency, the EU legislation does not provide any specific binding rule for the implementation of such a solution.

Specific provisions aimed at promoting a pricing policy for the efficient use of water resources were introduced with the Regulation laying down common provisions on European funds through the ex ante conditionalities mechanism that binds the use of the funds themselves. In more detail, the implementation of a water-pricing policy providing adequate incentives for users to use water resources efficiently was included among the ex ante conditionalities of the European Agricultural Fund for Rural Development.[52] Despite the European Commission having ascertained the potential for improvements in the definition of pricing policies because of this ex ante conditionality mechanism and having acknowledged the potential of investment in water efficiency but also the necessity of the latter for the achievement of the objectives of the WFD, this ex ante conditionality

[50] ibid, 572.

[51] In particular, with regard to the interpretation of the "polluter pays" principle, see P Schwartz, *The Polluter-Pays Principle* (Cheltenham, Edward Elgar Publishing 2018) pp 260–71; A Bleeker, "Does the polluter pay? The polluter-pays principle in the case law of the European Court of Justice" (2009) 18(6) European Energy and Environmental Law Review 289; S Kingston, "The polluter pays principle in EU climate law: an effective tool before the courts?" (2020) 10(1) Climate Law 1.

[52] See Annex XI, ex ante conditionality No. 6.1, lett a) of Regulation 2013/1303/EU.

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mechanism has not been provided within the more recent Regulation on European funds due to simplification purposes.[53]

In the pursuit of water efficiency objectives, an additional contribution could result from the employment of water-using products that require a reduced amount of water resources. On the regulatory side, which emerges from a report on this specific issue, the introduction of ecodesign requirements consisting of efficiency standards that products must fulfil could lead to significant water savings.[54]

The legal framework for EU ecodesign requirements was established by Directive 2009/125/EC, which provides the requirements that energy-related products must fulfil in order to be placed on the market and/or put into service.[55] Considering that the main purpose of the Directive is to promote sustainable development through increasing energy efficiency, limited consideration is devoted to water-using products. More specifically, among the products included within this category, the ecodesign requirements for the implementation of the Directive were determined only with regard to household washing machines[56] and household dishwashers.[57] In both cases, the requirements include not only energy efficiency parameters, but also standards connected to water consumption.

Nevertheless, potential room for the extension of the ecodesign requirements to further products and the inclusion of water efficiency standards might be acknowledged in future regulation resulting from the proposal for a regulation establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC.[58] In fact, in accordance with Article 1 of the latter, the scope of the Regulation is to establish a framework to improve the environmental sustainability of products and to ensure free movement in the internal market by setting ecodesign requirements and by not referring any longer only to energy-related products. In particular, besides energy efficiency, product resource efficiency has been included among the aspects that the ecodesign requirements will relate to. As a consequence of this, on the basis of such provisions, water efficiency standards might be considered among the ecodesign requirements that shall be further determined by the Commission within delegated acts.

Beyond the policy measures that involve single water-using products, another set of solutions that might contribute to increasing water efficiency are building-level policies that consist of voluntary and mandatory water performance rating/auditing of buildings, as well as minimum water performance requirements of buildings.[59] Despite the advantages deriving from the adoption of these solutions, including the avoidance of confusion in the building sector, the legislation in force does not provide regulation for this purpose. In fact, as in the case of the regulation of single types of products, recent EU legislation concerning common requirements within the building sector has regulated the energy performance of buildings rather than their water efficiency.[60] By contrast, specific criteria regarding water-saving installations have been defined within the context of EU

[53] Special Report No 20/2021 from the European Court of Auditors entitled "Sustainable water use in agriculture: CAP funds more likely to promote greater rather than more efficient water use".

[54] P Benito et al, "Water Efficiency Standards" (Bio Intelligence Service and Cranfield University, Report for European Commission (DG Environment) 2009).

[55] Art 1, para 2 of Directive 2009/125/EC.

[56] Commission Regulation (EU) No 1015/2010 of 10 November 2010.

[57] ibid.

[58] COM(2022) 142 final.

[59] In accordance with the analysis developed within the report by Mudgal et al, supra, note 40, these policy solutions offer significant potential for water and energy savings, whereas certification schemes for water reuse and harvesting would require an energy cost that is too high to be an advantageous solution.

[60] See Directive 2010/31/EU, as amended by Directive 2018/844/EU.

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Green Public Procurements as voluntary criteria that facilitate the inclusion of green requirements in the purchase of goods, services and works.[61]

Active awareness-raising policies that contribute to developing and/or consolidating a responsible water-saving culture constitute another relevant set of measures that might improve water efficiency. The strategic role of such measures in reducing household water consumption was highlighted in both the Commission Communication of 2007[62] and the Blueprint to Safeguard Europe's Water Resources,[63] and it was reaffirmed by the European Environmental Agency,[64] despite the acknowledged difficulties in measuring the effectiveness of such measures. In any case, in accordance with the pathway defined under the Commission Communication of 2007, the adoption of such measures was assigned to the national level, with particular regard to the development of educational programmes, advisory services, exchanges of best practices and large targeted communication campaigns focused on water quantity issues.

At the EU level, a significant contribution to a responsible water-saving culture might derive from product information requirements, on the assumption that sustainable water usage could be promoted only if consumers and companies are fully aware of the environmental implications of their actions.[65] However, any provisions on such an issue are not devoted to water consumption within EU legislation. Potential developments in this direction could derive from the adoption and implementation of the aforementioned proposal for a Regulation establishing a framework for setting ecodesign requirements for sustainable products and repealing Directive 2009/125/EC.[66] In fact, in accordance with Article 7, paragraph 2, letter b), page i), the information requirements shall, as appropriate, require products to be accompanied inter alia by information on the performance of the product in relation to the product parameters referred to in Annex I, which includes, among other aspects, the consumption of water in one or more life cycle stages of the product.[67]

1. The regulation of water efficiency within the agricultural sector

Within the context of the policy measures to improve water-use efficiency, particular attention has to be devoted to the agricultural sector, given its dependence on water availability. More specifically, as specified by the European Environment Agency, different types of pressures on the aquatic environment might result from agricultural production (ie the pollution from diffuse sources, water abstraction and hydro-morphological pressures).[68] In this regard, irrigation relies on water abstracted from surfaces or groundwater, especially within drier climates, and increased demand for the abstraction of water reduces recharge rates and surface water and groundwater levels, negatively impacting the achievement of the WFD objectives. In particular, surface abstraction might reduce river flows to below critical levels, increase pollutant concentrations and causing

[61] In more detail, criteria that involve water saving are specified with regard to office building design, construction and management, sanitary tapware, as well as flushing toilets and urinals. See section B6 of the EU GPP Criteria for Office Building Design, Construction, and Management (SWD(2016) 180 final).

[62] See point n. 2.6 of COM(2007) 414 final.

[63] See point n. 2.5 of COM(2012) 673 final.

[64] G Dige et al, "Pricing and non-pricing measures for managing water demand in Europe" (Technical Report No. 3415. Service Contract, 2015).

[65] I Benöhr, "The Right to Water and Sustainable Consumption in EU Law" (2023) 46 Journal of Consumer Policy 53, 73.

[66] COM(2022) 142 final.

[67] See lett g) of the Annex I of COM(2022) 142 final.

[68] European Environment Agency, "Water and agriculture: towards sustainable solutions" (Copenhagen, European Environment Agency Report No 17/2020) p 30.

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damage to wetland habitats. Similarly, the exploitation of groundwater makes water tables lower and modifies groundwater flow patterns, with the potential for deterioration of aquatic and terrestrial ecosystems.[69]

For this reason, analysis needs to be directed towards agricultural policies in order to understand the extent to which the EU policies and its legislative framework incentivise the sustainable use of water resources within the agricultural context. With regard to this topic, a recent analysis has been developed by the European Court of Auditors, covering the 2014–2020 CAP programming period. The audit found that agricultural policies at both the EU and Member State levels were not consistently aligned with EU water policy, with specific reference to the CAP schemes of funds, as well as the system for authorising water abstraction and the aforementioned water-pricing mechanisms.[70]

Regarding agricultural production support of the 2014–2020 CAP programming period, unlike the direct green payments that were beneficial regarding water quantity,[71] such direct payments under the basic payment scheme and the single-area payment scheme were neutral regarding water use. However, the beneficiaries of these direct payments and the other beneficiaries specified under Article 92 of Regulation 2013/1306/EU were required to comply with the rules specified under the cross-compliance mechanism. Among the different rules on cross-compliance provided by Annex II, compliance with irrigation authorisation procedures was included, in the hypothesis that the use of water was subject to this compliance. As a consequence of this, if the beneficiary did not comply with such a provision, an administrative penalty was imposed.

Within the context of the new CAP 2023–2027 programming period, Regulation 2021/2115/EU has widened the extent of cross-compliance. In fact, as foreseen by Article 12, paragraph 1 of Regulation 2021/2115/EU, cross-compliance is applied to the beneficiaries receiving direct payments under Chapter II or annual payments under Articles 70, 71 and 72 of the same Regulation, as well as to the beneficiaries receiving support in accordance with Chapter IV of Regulation 2013/228/EU or Chapter IV of Regulation 2013/229/EU, under Article 83, paragraph 1 of Regulation 2021/2116/EU.[72]

Regarding the content of the new cross-compliance rules, currently, as for the water use provisions, Annex III of Regulation 2021/2015/EU directly refers to Article 11, paragraph 3, letter e) of the WFD. In accordance with Article 11 of the WFD, Member States are required to have control over abstraction and to set out prior authorisation regimes as measures to be periodically reviewed and updated in case of necessity. Coherent with the mentioned provision, Member States might exempt from these controls over the abstractions or impoundments that have no significant impact on water status. However, as found in the aforementioned audit, not only does the amount of these exemptions seem to be considerable, but also the possibility of acknowledging whether the abstraction remains below a significant level is limited where there is no mandatory metering.[73]

Besides the cross-compliance rules, new provisions were introduced with regard to the types of intervention in the form of direct payments that could have an impact on water use.[74] More specifically, among the aspects reformed within the new CAP, schemes for the climate, the environment and animal welfare were introduced as new types

[69] ibid.

[70] See point VI of Special Report No 20/2021 from the European Court of Auditors, supra, note 53.

[71] In more detail, as was underlined by the European Court of Auditors, green direct payments promote the maintenance of permanent grassland and are focused on uncultivated areas and other landscape features that can increase natural water retention.

[72] In fact, differently from the CAP 2014–2020 programming period, the rules of the new CAP 2023–2027 programming period are also applied with regard to the small farmer scheme.

[73] See Special Report No 20/2021 from the European Court of Auditors, supra, note 53, p 19.

[74] Art 16 of Regulation 2021/2115/EU.

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of decoupled direct payments. In accordance with Article 31, paragraph 4 of Regulation 2021/2115/EU, each eco-scheme defined by the Member States shall cover at least two out of seven areas of action, and the reduction of pressure on water resources has been included among these.[75] Despite these provisions coherently fitting with the objective for more efficient and sustainable water use in agriculture, the actual impact of the latter will depend on the discretion of individual Member States.

Likewise in the CAP 2014–2020 programming period, the CAP 2021–2027 programming period does not consist only of the mentioned types of direct payments to farmers, but also of funds aimed to support the sustainable development of rural areas. By focusing analysis on the water use issue, the investments in irrigation have been confirmed to be included among the different types of intervention under Article 69, letter d) of Regulation 2021/2115/EU. Analogously to the rules previously in force,[76] the investments in irrigation are subject to a complex system of conditions set out in Article 74 of Regulation 2021/2115/EU. Firstly, as a general condition, the Member State must send to the Commission the river basin management plan for the area concerned by the investment, as well as any other areas whose environment may be impacted by the latter. Moreover, another general condition requires that water metering shall be in place or shall be put in place as part of the investment in order to measure the use of water. In the case of an investment aimed to improve an existing irrigation installation or element of irrigation infrastructure, the support is granted only if it offers potential water savings reflecting the technical parameters of the existing installation or infrastructure in accordance with an ex ante assessment. Alternatively, the same support is granted whether an effective reduction in water use is achieved by contributing to the achievement of the good status of those water bodies (eg Article 4, paragraph 1 of WFD), in the case that the investment affects bodies of groundwater or surface water whose status has been identified as less than good in the concerned river basin management plan due to water quantity reasons. However, if such an investment affects only energy efficiency or concerns the creation of a reservoir or the use of reclaimed water that does not affect a groundwater or surface water body, these conditions are not applied. In this regard, investments in the use of reclaimed water as an alternative water supply may be supported by the Member States only if the provision and use of it are compliant with Regulation 2020/741/EU. Specific conditions are also provided in the case that the investment results in a net increase of the irrigated area by affecting a given body of groundwater or surface water, presumably with the aim of limiting the potential negative impacts of the "rebound effect". In more detail, Member States may grant support for such an investment only if the status of the water body has not been identified as less than good in the concerned river basin management plan due to water quantity reasons and an environmental impact analysis carried out or approved by the competent authority shows that no significant negative environmental impacts will result from the investment. Finally, one last condition is provided for investments in the creation or expansion of a reservoir for the purpose of irrigation: Member States may grant support for such investments only if they do not lead to significant negative environmental impacts.

In conclusion, one might positively evaluate the overall legislature's efforts to adapt the regulatory framework to the renewed legislation on water reuse, as well as the elimination of the derogations provided under the previous Regulation.[77] Beyond these specific aspects, with regard to the definition of the boundaries for the investments in irrigation, one might acknowledge that, coherent with the whole CAP system, the European

[75] See Art 31, para 4, lett c) of Regulation 2021/2115/EU.

[76] See Art 46 of Regulation (EU) 1305/2013.

[77] The reference is to Art 46(6) of Regulation 2013/1305/EU, which established the conditions under which investments that result in a net increase in irrigated area might be eligible.

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legislature has preferred a regulatory approach mainly based on a proximity principle rather than harmonised regulation at the EU level. In fact, while under the provisions previously in force specific percentage ranges related to a potential and effective reduction of water use were directly defined by Regulation 2013/1305/EU, within the context of the new CAP these aspects are determined by the Member States within their respective strategic plans.

V. At the bottom of the water hierarchy: the supply-side preventative measures

The development of additional water supply infrastructure constitutes a further solution aimed at preventing water scarcity and reducing drought risks. Within this category, different measures are included, such as the construction of new infrastructures for surface water or groundwater storage, such as dams, water transfers or the use of alternative sources through desalinisation or wastewater reuse. However, in accordance with the water hierarchy resulting from the Commission Communication of 2007, such policy options represent residual solutions to be developed after all other prevention measures have been implemented and by taking into adequate account the cost–benefit dimension, including environmental impacts.[78]

Despite these preventative measures being collocated within the same water hierarchy level, the EU regulatory approaches with regard to the latter have been highly variable. For instance, the implementation of dam building and water transfers might meet different legal constraints and obstacles from the perspective of EU legislation, given the several complications caused by the adoption of these solutions. Among the latter, not only might such measures provoke social and political conflicts between donors and receiving basins, but they also might negatively impact the environment by changing the water bodies' status due to the interruption or transfer of stream flows, as highlighted by the European Commission.[79] Unsurprisingly, dams and other installations designed for the holding back or permanent storage of water are included among the projects that shall be made subject to environmental impact assessments or screening procedures, in accordance with Article 4, paragraphs 1 and 2 of Directive 2011/92/EU.[80]

With specific regard to inter-basin water transfer, which could be defined as the transfer of water from one basin to another distinct basin or river catchment or a sub-basin within a shared basin or river reach, respectively,[81] different types of impacts on water supply, hydrology and the environment in both donor and receiving basins have been acknowledged.[82] In more detail, on the basis of past experiences, the donor basins have experienced environmental degradation attributable inter alia to the overestimation of the available water quantities and a lack of compliance with minimum stream flow

[78] Not surprisingly, in COM(2012) 672 final, the European Commission critically pointed out that some Member States developed additional water supply infrastructure before exploiting the full potential of water-saving measures and without a systemic consideration of the potential environmental impacts resulting from such new water supply infrastructure.

[79] COM(2007) 414 final.

[80] Para 15 of Annex I and para 10, lett g) of Annex II of Directive (EU) 2011/92.

[81] J Gupta and P Zaag, "Interbasin water transfers and integrated water resources management: where engineering, science and politics interlock" (2008) 33(1–2) Physics and Chemistry of the Earth, Part A: Solid Earth and Geodesy 28.

[82] MAB Siddik, KE Dickson, J Rising, BL Ruddell and LT Marston, "Interbasin water transfers in the United States and Canada" (2023) 10 Scientific Data 27.

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requirements.[83] In addition, massive investments are required for the development of the infrastructure necessary for water transfers.[84]

From a juridical point of view, any specific provision related to inter-basin water transfers, either on their permissibility as water infrastructure projects or the specific conditions under which they should be implemented, is not provided within EU water law.[85] However, some provisions set out under the WFD in conjunction with the principle of sustainable water use condition the assessment of the permissibility of these water projects. In particular, the limits resulting from the carrying and the re-generational capacities of the aquatic ecosystems and the need for the preservation of watercourses from both a qualitative and a quantitative perspective in such a way that the water needs of future generations would be preserved significantly affect the permissibility of inter-basin water transfer projects. Therefore, as has been pointed out, within such a normative context, the authorisation of such infrastructure would be hardly compatible with the relevant EU regulatory framework given the strict conditions that they would be subject to.[86]

By contrast, the regulatory approach of the EU with regard to the reuse of water as a measure that could alleviate water stress in the EU has been significantly different, as proven by the approval of Regulation 2020/741/EU of the European Parliament and of the Council of 25 May 2020 on minimum requirements for water reuse. Before the adoption of the latter, the provisions concerning this topic were particularly limited. More specifically, water reuse is mentioned in Directive 2000/60/EC as one of the supplementary measures that Member States may choose to apply to achieve that Directive's objectives (ie a good qualitative and quantitative water status for surface water bodies and groundwater bodies). Moreover, water reuse is also mentioned by Directive 1991/271/EEC, under Article 12, with the provision that treated wastewater shall be reused whenever appropriate. As a consequence of this fragmented and uneven regulatory framework among the Member States, the uptake of such a solution has been particularly marginal.[87]

Regulation 2020/741/EU, which has been approved following extensive consultation,[88] aims to address these barriers to the uptake of water reuse solutions with particular reference to the environmental risks and perceived health risks resulting from the differences in quality requirements or the lack thereof and possible trade barriers. In more detail, in accordance with Article 1, paragraph 2 of Regulation 2020/741/EU, the purpose of the act is to guarantee safety regarding the use of reclaimed water for agricultural irrigation, thereby ensuring a high level of environmental as well as human and animal health protection, promoting the circular economy, supporting climate change adaptation and contributing to the objectives of Directive 2000/60/EC by addressing water scarcity and the resulting pressures on water resources in a coordinated way throughout the Union, thus also contributing to the efficient functioning of the internal market. To these aims, the Regulation sets out minimum requirements for water quality and monitoring, as

[83] V Karageorgou, "The Permissibility of Projects for Interbasin Water Transfer under the Prism of the EU Water and Environmental Legislation" in V Bernard and S Lorenzo (eds), *EU Environmental and Planning Law Aspects of Large-Scale Projects* (Cambridge, Intersentia 2016) pp 249–78.

[84] L Purvis and A Dinar, "Are intra- and inter-basin water transfers a sustainable policy intervention for addressing water scarcity?" (2020) 9 Water Security 100058.

[85] Karageorgou, supra, note 83.

[86] ibid.

[87] More generally, with regard to the lack of homogeneity among Member States' policies to improve uptake and promote a new circular economy for water-delivery models, see Y Qtaishat, J Hofman and K Adeyeye, "Circular Water Economy in the EU: Findings from Demonstrator Projects" (2022) 4 Clean Technology 865.

[88] Regarding this aspect related to the preliminary consultation, see A Berti Suman and A Toscano, "Public Acceptance of Water Reuse for Agriculture in the Wake of the New EU Regulation: Early Reflections" (2021) 18(3) Journal for European Environmental & Planning Law 225.

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well as provisions on risk management for the safe use of reclaimed water.[89] These minimum requirements for water quality concern only treated urban wastewater being reused for agricultural irrigation. However, in conformity with the recital 29 of the Regulation, the indication of this specific use should not preclude Member States from allowing the use of reclaimed water for other purposes, such as industrial, amenity-related and environmental purposes, provided a high level of environmental and human and animal protection is ensured.

A further margin of discretion is also enjoyed by Member States with regard to the same reuse of water if they decide that is not appropriate to implement such a measure in one or more of their river basin districts or parts thereof. Clearly, this decision cannot result from an arbitrary choice, since it has to be justified on the basis of specific criteria and submitted to the Commission.[90] Moreover, in view of the potential variability in climatic conditions, such decisions shall be reviewed as necessary, taking into account climate change projections and national climate change adaptation strategies, and at least every six years, and also taking into account river basin management plan provisions.[91] Besides the specification regarding the obligations of the reclamation facility operator and the obligations regarding reclaimed water quality,[92] particular relevance is devoted to risk management. More precisely, in accordance with Article 5, the competent authority shall ensure that a water reuse risk management plan is established, coherent with a proactive approach to risk management.[93] Regarding the competent subject for the development of the plan, the Regulation does not provide a univocal solution. In fact, such a plan shall be prepared by the reclamation facility operator, other responsible parties and end users as appropriate by consulting all other relevant parties, as well as the same end users, as appropriate.

The Regulation does not indicate a compulsory list of features that the plan shall regulate, but it specifies the elements that the competent authority shall set out "in particular", to be reasonably interpreted as a minimum content of the plan. Within this context, the relevance of the plan derives in particular from its conditioning on the definition of the obligations of the reclamation facility operator and, where relevant, of any other responsible parties. As is provided under Article 6, paragraph 3 of the Regulation, indeed, the permits that set out such obligations shall be based on the same water reuse risk management plan.

Among the further aspects regulated under this act, specific provisions are also devoted to obligations concerning awareness-raising measures and information sharing on water reuse to the general public. Regarding this aspect, on the basis of these provisions, it has been pointed out that the breadth of public engagement foreseen by the Regulation has been limited to passive involvement rather than (pro)active participation in the process.[94]

[89] See Art 1, para 1 of Regulation 2020/741/EU.

[90] In more detail, in conformity with Art 2, para 2 of Regulation 2020/741/EU, the criteria to be taken into account within the delivery of such a decision are: the geographical and climatic conditions of the district or parts thereof (lett a); the pressures on and the status of other water resources, including the quantitative status of groundwater bodies (lett b); the pressures on and the status of the surface bodies in which treated urban wastewater is discharged (lett c); and the reclaimed water and other water resources' environmental and resource costs (lett d).

[91] As specified by A Di Martino, "Water Law in Circular Economy: Ultra Vires Actions in Environmental Sector, or When Union Ambition Far Exceed Its Abilities" (2022) 29(2) Maastricht Journal of European and Comparative Law 182, the legal effects of an eventual opposition or inaction from Member States are untested.

[92] See Art 4 of Regulation 2020/741/EU.

[93] In this sense, see A Molina Giménez, "Análisis jurídico del Reglamento (UE) 2020/741, de 25 de mayo de 2020, sobre reutilización de aguas regeneradas, y estudio de su repercusión en España" (2021) 48 Revista Aranzadi de Derecho Ambiental 147, who positively evaluated this planning tool.

[94] In this sense, see Berti Suman and Toscano, supra, note 88. An analogous opinion with regard to the passive engagement on the part of the public within this Regulation is also supported by Benöhr, supra, note 65.

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One might agree with such critical remarks, especially on the basis of a comparison of these Regulation's provisions concerning the risk management plan with the participatory mechanisms that are guaranteed in the case of the river basin management plans. In the case of the risk management plan, as already specified, the Regulation merely states that the parties responsible for the plan's development should consult all of the other parties, as well as the same end users, as appropriate. By contrast, with regard to the production, review and updating of the river basin management plans, Directive 2000/60/EC provides for preventative public consultation, with the preliminary publication of some of the relevant elements of the plan, with the aim of collecting comments from the public (Article 14).[95]

The adoption of Regulation 2020/741/EU has to be embraced overall since it seems to express a solid awareness that water scarcity and drought risks interest the entire European dimension in the context of the climate variability that impacts Europe as a whole. The European relevance of this topic not only is due to physical environmental aspects, considering that 60% of EU river basins are international, but also is due to the critical consequences that would ensue as a result of a regulatory inconsistency among Member States, including negative impacts on the proper functioning of the internal market. As underlined within the impact assessment of the Regulation, indeed, different requirements negatively impact the level playing field and cause obstacles to the internal market, as in cases in which specific criteria are used as arguments to restrict the import of food products from Member States with lower requirements.

Certainly, we should underline that the approval of such a regulatory measure with regard to this risk area has potentially been made easier since it regulates qualitative features of water resources, although the act was adopted with the objective of impacting quantitative aspects in order to alleviate pressure on water resources. Therefore, as a result of this, the Regulation was adopted under the procedure of Article 192, paragraph 1, instead of the more demanding procedure provided under paragraph 2 of the same article.

On the basis of similar premises, an analogous legal act should be adopted with regard to desalinisation, as a further alternative water supply approach that might reduce pressure on water resources. Indeed, despite considerable uptake of desalinisation plants in the European territory,[96] any common regulatory frameworks or any specific provisions for the regulation of qualitative water aspects involved in the desalinisation process have not been approved so far.[97]

VI. Concluding remarks

The article aimed to critically examine the current status of European legislation on water stress risk regulation by comparing it with the pathway defined under COM(2007) 414.

[95] Besides these aspects, the other articles of the Regulation concern the compliance check (Art 7), the cooperation between Member States (Art 8), information relating to the monitoring of implementation (Art 11), the evaluation and review of the Regulation (Art 12), the power to adopt delegated acts that was conferred on the Commission (Art 13), the committee procedure (Art 14), the penalties provisions (Art 15) and the terms of the entry into force and application of the Regulation (Art 16).

[96] As specified in European Commission, Directorate-General for Maritime Affairs and Fisheries, Joint Research Centre, "The EU blue economy report 2020" (Luxembourg, Publications Office of the European Union 2020 <https://data.europa.eu/doi/10.2771/363293>), in 2019, an amount of 1573 operational desalination plants were located in the EU Member States, offshore or in coastal areas.

[97] For a recent overview of the desalinisation sector from technological and EU and regional policy perspectives, see J Post, P de Jong, M Mallory, M Doussineau and A Gnamus, "Smart Specialisation in the Context of Blue Economy – Analysis of Desalination Sector" (Luxembourg, Publications Office of the European Union, Luxembourg 2021, doi:10.2760/058360).

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Regarding the measures examined within Section III, one must acknowledge the significant efforts made at the European level to improve the processes of identifying, monitoring and forecasting drought risk as well as water scarcity circumstances. However, despite the existence of such information assets, EU legislation still does not require the approval of administrative planning instruments for managing this risk, unlike the case of flood risk management under Directive 2007/60/EC.

Regarding the solutions to reduce human pressure on water bodies and related ecosystems, the legal aspects of the measures aimed at increasing water efficiency have been examined. In this regard, pricing systems have been identified as suitable tools for improving water efficiency for more effective water demand management. However, given the absence of specific provisions within the EU legislation, the adoption of volumetric charges based on real use is still the result of a contingent decision of Member States. Previously, there were specific provisions promoting a pricing policy for efficient water resource use within the ex ante conditionalities of the European Agricultural Fund for Rural Development. However, these provisions have been abrogated in the more recent European Funds Regulation.

A contribution to increasing water efficiency also stems from the improvement of water-using products' performance. Despite the limitations highlighted in the current legislation, the proposal for a regulation establishing a framework for setting ecodesign requirements goes beyond energy efficiency. Consequently, within the proposal, there is potential room for extending ecodesign requirements to additional products and incorporating water efficiency standards.

Within this article, particular attention has been given to the agricultural sector. Several measures in this regard have been positively evaluated, including the adaptation of the regulatory framework to the new legislation on water reuse and the removal of derogations for conditionalities related to investments resulting in a net increase in irrigated areas. However, with regard to specific aspects related to investment boundaries in irrigation, unlike the previous regulatory framework, the European legislature has not defined specific percentage ranges for potential and effective reductions in water use. Instead, the responsibility for determining these aspects has been left to Member States.

Regarding the supply-side prevention measures, significant further steps have been made with regard to wastewater reuse. In fact, with the approval of Regulation 2020/741/EU, the legislature systematised a fragmented regulatory framework. By contrast, in the case of desalination plants, a common EU regulatory framework is still lacking.

In conclusion, as can be seen from this analysis, regulation at the EU level on this topic is uneven. While in some cases the legal framework of the measures to be taken has been fully defined, in other cases Member States are left to adopt autonomously specific measures without any reference standards or common principles. Beyond those regulatory gaps whose opportunities for remedy have been highlighted within the article, it is noteworthy that while traditionally the broader topic of water quantity regulation has remained outside the purview of the European legislature, in more recent times this topic has been progressively assuming an increasingly prominent position within the regulatory framework of the EU, despite the structural limits under EU primary law. In fact, in accordance with Article 192, paragraph 2 of the Treaty on the Functioning of the European Union, the measures that affect the quantitative management of water resources or have a direct or indirect impact on the availability of water resources are to be adopted under a special legislative procedure with the Council acting unanimously.[98]

[98] The Council shall act unanimously after consulting the European Parliament, the Economic and Social Committee and the Committee of the Regions.

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Within this context, as has been highlighted, the risks of drought and water scarcity pervasively concern a wide variety of regulatory areas by affecting different aspects that concern the entire EU. This research has been developed taking into account the legal aspects related to risk reduction of water stress phenomena in EU territory. However, several other legal issues are involved within the same European context. For instance, water stress risk could negatively impact food and nutrition security in the EU. Moreover, a number of other issues are involved when broadening the perspective to a global level. In that sense, for instance, migration processes could be significantly impacted by the potential evolution of water stress risk due to climate change.[99] The wide array of linkages between water stress risks and other phenomena in the context of climate change and their legal implications for the EU highlight the need for further in-depth analyses on this issue.

As a consequence of such cross-sectoral impacts of these phenomena, the regulation of water scarcity and drought risks cannot find its source in a single act but in an array of legal acts that have been joined through the common thread of COM(2007) 414. However, the more general European regulatory framework has undergone substantial transformation compared to the context within which the Commission's 2007 Communication was approved. In this sense, it might be sufficient to give as evidence the definition of new priority objectives with the approval of the European Green Deal. Not surprisingly, with specific regard to the water sector, new ambitious objectives have been set as part of the EU Strategy on Adaptation to Climate Change, including inter alia: ensuring climate-resilient sustainable use and management of water across sectors and borders by improving the coordination of thematic plans and other mechanisms, such as water resource allocation and water permits; reducing water use through raising the water-saving requirements for products by encouraging water efficiency and savings and by promoting the wider use of drought management plans, as well as sustainable soil management and land use; and guaranteeing a stable and secure supply of drinking water by encouraging the incorporation of the risks of climate change into risk analyses of water management.

In light of the above, alongside addressing the regulatory gaps outlined in this article, it is advisable to consider the approval of a new strategic document that defines the set of measures to be adopted in order to adapt the previous pathway to a renovated EU legal framework. The state of implementation of this strategic document should be subjected to periodic verification, also taking into account the adequacy of the provisions with regard to the potential variability of these risks due to climate change. The definition of such a new strategic pathway presumably could more solidly guide the transformational changes across sectors that are required for a more climate-resilient and sustainable use of water.[100]

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[99] The literature concerning the nexus between climate change and migration is notably extensive. For a recent and concise overview of such an issue, see European Migration Network, "Displacement and migration related to disasters, climate change and environmental degradation" (EMN Informs 2023).

[100] The identification of the "transformational changes" as necessary actions for sustainable use of water derives from the EU Strategy on Adaptation to Climate Change (COM(2021) 82 final).

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