

# REVISION OF THE POLICY INSTRUMENTS AND THEIR POTENTIAL TO CONTRIBUTE TO EU DROUGHTS AND WATER SCARCITY POLICIES

INTEGRATED DROUGHT MANAGEMENT PROGRAMME IN  
CENTRAL AND EASTERN EUROPE

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# REVISION OF THE POLICY INSTRUMENTS AND THEIR POTENTIAL TO CONTRIBUTE TO EU DROUGHTS AND WATER SCARCITY POLICIES

The **Global Water Partnership Central and Eastern Europe (GWP CEE)** is an international network, which comprises 11 Country Water Partnerships in Bulgaria, Estonia, Hungary, Latvia, Lithuania, Moldova, Poland, Romania, Slovakia, Slovenia and Ukraine and more than 200 partners located in 15 countries in the CEE region. Its mission is to advance governance and management of water resources for sustainable and equitable development. GWP CEE is a part of GWP's global network that consists of thirteen regions and 3000+ Partners across the world.



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## EU Strategy for the Danube Region (EUSDR), Priority Area 5

EUSDR is the second macroregional strategy of EU adopted in 2011. This very heterogeneous macro region covering the Danube river basin from Baden-Württemberg in Germany down to the the Black Sea is comprised of 14 countries altogether, including EU and non-EU countries as well. The cooperation in the framework of the EUSDR facilitates sustainable economic growth, coordination of efforts along 12 priority areas and aims to reduce regional disparities between countries, in-line with the [Action Plan](#) adopted first in 2010 and revised in 2020.

The Environmental Risks Priority Area (PA5) – coordinated by Hungary and Romania – has three major objectives to follow during its work. One of them addresses the challenges of water scarcity and droughts in line with the Danube River Basin Management Plan – Update 2015, the report on the impacts of droughts in the Danube Basin in 2015 and the ongoing work in the field of climate adaptation. Therefore, in the past few years EUSDR PA5 contributed to the elaboration of the ICPDR Climate Change Adaptation Strategy Update 2018, supported project elaboration and implementation in the field of drought management and climate change related spatial planning (e.g. the DriDanube, WateratRisk and CAMARO-D projects), disseminated scientific results to anticipate regional and local impacts of climate change through research (e.g. financing the [publication of special issues of scientific journals](#), organizing workshops etc.).

Further information on EUSDR PA5 is available at <https://environmentalrisks.danube-region.eu>

**Integrated Drought Management Programme for Central and Eastern Europe (IDMP CEE)** supports the governments of Bulgaria, the Czech Republic, Hungary, Lithuania, Moldova, Poland, Romania, Slovakia, Slovenia and Ukraine in the development of drought management policies and plans. It also builds capacity of stakeholders at different levels for proactive integrated drought management approach and tests innovative approaches for future drought management plans. It is part of the Integrated Drought Management Programme (IDMP), which was launched by WMO and GWP at the High-level Meeting on National Drought Policy in March 2013. Further information on the IDMP is available at [www.droughtmanagement.info](http://www.droughtmanagement.info)

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## REVISION OF THE POLICY INSTRUMENTS AND THEIR POTENTIAL TO CONTRIBUTE TO EU DROUGHTS AND WATER SCARCITY POLICIES



MINISTRY OF ENVIRONMENT,  
WATERS AND FORESTS

*This review was prepared as collaboration of Integrated Drought Management Programme in CEE and PA 05 Environmental Risks project (Acronym: DTP-PAC1-PA5; Lead partner: Ministry of Foreign Affairs and Trade of Hungary; The project is co-funded by the European Union (ERDF fund) with the financial contribution of partner states and institutions)*

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# ACRONYMS

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**CAP** – Common Agricultural Policy

**CC** – Climate Change

**DMP** – Drought Management Plan

**EDO** – European Drought Observatory

**EED** – Energy Efficiency Directive

**EIP-AGRI** – European Innovation Partnership for Agricultural productivity and Sustainability

**EUCPM** – EU Civil Protection Mechanism

**EUSDR** – EU Strategy for the Danube Region

**GI** – Green Infrastructure

**GWP CEE** – Global Water Partnership Central and Eastern Europe

**ICPDR** – International Commission for the Protection of the Danube River

**MS** - Member State (of the EU)

**NECP** – National Energy & Climate Plans

**NEEAP** – National Energy Efficiency Action Plan

**PA** – Priority Area

**RBD** – River Basin District

**RBMP** – River Basin Management Plan

**RDP** – Rural Development Programme

**WFD** – Water Framework Directive

**WMO** – World Meteorological Organization

**WS&D** – Water Scarcity & Droughts

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# 1. Introduction

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A nature-induced phenomenon of **drought** is a temporary decrease of the average water availability due to rainfall deficiency. Droughts can occur anywhere in Europe, in both high and low rainfall areas and in any season. In recent decades the most severe drought in Europe in 2003 was followed by droughts in 2007, 2011, 2013, 2015, 2017, 2018 that affected large parts of Southern, Western and even Northern Europe. Despite that, less attention has been paid to introduce pro-active policy measures to address droughts, although the concerns about drought events have grown in the last decade.

It becomes obvious that droughts have a direct impact on citizens and economic sectors which use and depend on water, such as agriculture, tourism, industry, energy and transport.

Sound drought management planning requires a **cooperation** and **involvement** of key sectors that abstract, consume and discharge water (both surface and ground water). Most frequent measures adopted in large parts of Europe are “reactive” measures. These include a development of new water sources (transfer from rich to water poor regions/basins). These bring high investments and might be deteriorating to the ecosystems. Another group of measures involve “preventive” measures - setting minimal flow requirements. Among the preventive measures are all kinds of interventions to save and retain water available from wet periods, and to increase the buffering capacity of the soil and the water system. Lastly there are “adaptive” measures: to accept the limitations of the natural system and consequently adapt the water use to the drought risks that the system generates. In other words, not “water levels should be adjusted to follow chosen human land and water uses,” but “land and water uses should follow water levels as they result from natural circumstances.” This third (advanced) feature of the drought management is broadly missing in the current EU architecture.

## 1.1. GENERAL OBJECTIVES AND SCOPE

Main objective of this analysis was to make a review of relevant existing EU legal frameworks in different sectors and find out how they can contribute to “EU drought policy”.

It is meant to be an addition to the [Guidelines for preparation of the Drought Management Plans<sup>1</sup>](#) which introduced a seven step approach to develop a plan in the context of the EU Water Framework Directive. This analysis is aiming to identify any of other selected policies in the field of water, agriculture, climate change, energy, industry, transport, nature and biodiversity and might be complementary and supporting to management of droughts, even if those policies were not geared to primarily address droughts.

This document will serve countries with background information for the integration of drought management into most relevant existing policies. Additionally, it will support the development of a separate (new) drought policy with reference to existing legal frameworks.

## 1.2. METHODOLOGY

The methodology was based on analysis of main policy documents for each sector, carried out by experts from different fields, focusing on the five criteria below, to justify how the given policy (instrument, document, etc.) support drought management:

- **Monitoring/data collection**

Does the given policy consider/require the following: creation of important data to be used for drought monitoring; collection, processing of data and monitoring network that could be used to assess hydrological, meteorological and agricultural drought; systematic monitoring of river discharges at selected points, monitoring of water abstraction/discharge, monitoring and forecast of meteorological, soil, river and groundwater levels.

- **Incentives to water efficiency and circular economy**

Does the given policy promote the reduction, re-using and retaining of water through: contributing to reduction of amount of water required for purposes in different sectors and the amount of water used or delivered for different sectors; fostering water efficient technologies and practices, as well as water saving culture; measures that contribute to drought resilience in sectors; economic incentives (price, tax, fee) to address water efficiency.

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<sup>1</sup> Global Water Partnership Central and Eastern Europe (2015): Guidelines for the preparation of Drought Management Plans. Development and implementation in the context of the EU Water Framework Directive, Global Water Partnership Central and Eastern Europe, 48pp

- **Knowledge production and research on drought preparedness and resilience**

Does the given policy consider the following: requirements and support of conducting research; working with stakeholders to better understand the impact of drought on water availability and quality; solutions to help communities to increase resilience to droughts; support knowledge production that other sectors could benefit.

- **Measures to improve drought management and to develop drought management plans**

Does the given policy consider the following: measures that require, support integrated drought management; co-operation with other sectors; administrative, regulatory and financial measures to address drought.

- **Financial instruments to adapt/mitigate droughts**

Does the given policy consider the following: developing and incorporating comprehensive insurance and financial strategies into drought preparedness plans; stipulating financial instruments that are relevant for adaptation (mitigation) of droughts.

Experts analysed different documents with these 5 criteria and provided their assessment with:

- score: (-) not mentioned; (0) generally addressed; (+) support actions (see Table 1); and
- short explanation for their evaluation (Annex 1) which is summarized in Chapter 2.

## 2. Water scarcity and drought – sectoral analysis

### 2.1. WATER

At European level, the focus of policy makers has been on **water scarcity** (rather than drought)<sup>2</sup>. The main reason is an over abstraction of water resources to satisfy long-term average requirements. Water availability problems frequently appear in areas with low rainfall but also in areas with high population density, intensive irrigation and/or industrial activity. Water scarcity is reported for the whole Mediterranean area, and for some areas in Central, Eastern and Northern Europe. Beyond water quantity, a situation of water scarcity can also emerge from acute water quality issues (e.g. diffuse or point source pollutions) which lead to reduced fresh/clean water availability. Water scarcity and droughts also have broader impacts on natural resources at large scale through negative side-effects on biodiversity, water quality, increased risks of forest fires and soil degradation.

Water scarcity and droughts are traditionally addressed by **water managers**. In the last decade, a close cooperation between water managers and climatologists is evident to monitor, measure and document changing climatic indicators (precipitation, temperature, heat waves) across Europe.

Water related directives concern **all economic, social and environmental sectors**. Specifically, **EU Water Framework Directive (EU WFD) (2000/60/EC)** imposes an obligation to develop River Basin Management Plans (RBMP). Although, EU WFD is predominantly focused on qualitative aspects, quantitative issues are also covered. The purpose of the WFD is to enhance the protection of water bodies and the status of aquatic ecosystems by promoting sustainable water use placing the integrity of freshwater ecosystems at the core of water management. Measures to prevent and alleviate consequences of drought and water scarcity are thereby entirely appropriate within this context. For the first time WFD compatible RBMPs were developed in 2009 for River Basin Districts (RBD) of the EU (and in 2015 these plans were updated).

The 2012 assessment of WFD implementation (**COM(2012) 670**) has identified shortcomings in the RBMPs, among others, in relation to **water quantity measures**. The most commonly identified causes of drought correspond to irregular rainfall patterns – usually perceived as meteorological drought – in 43 RBDs; and the decrease of natural available resources – usually perceived as hydrological drought – in 32 RBDs (Schmidt and Benítez-Sanz 2012)<sup>3</sup>.

<sup>2</sup> While “drought” means a temporary decrease in water availability due for instance to rainfall deficiency, “water scarcity” means that water demand exceeds the water resources exploitable under sustainable conditions.

<https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0414:FIN:EN:PDF>

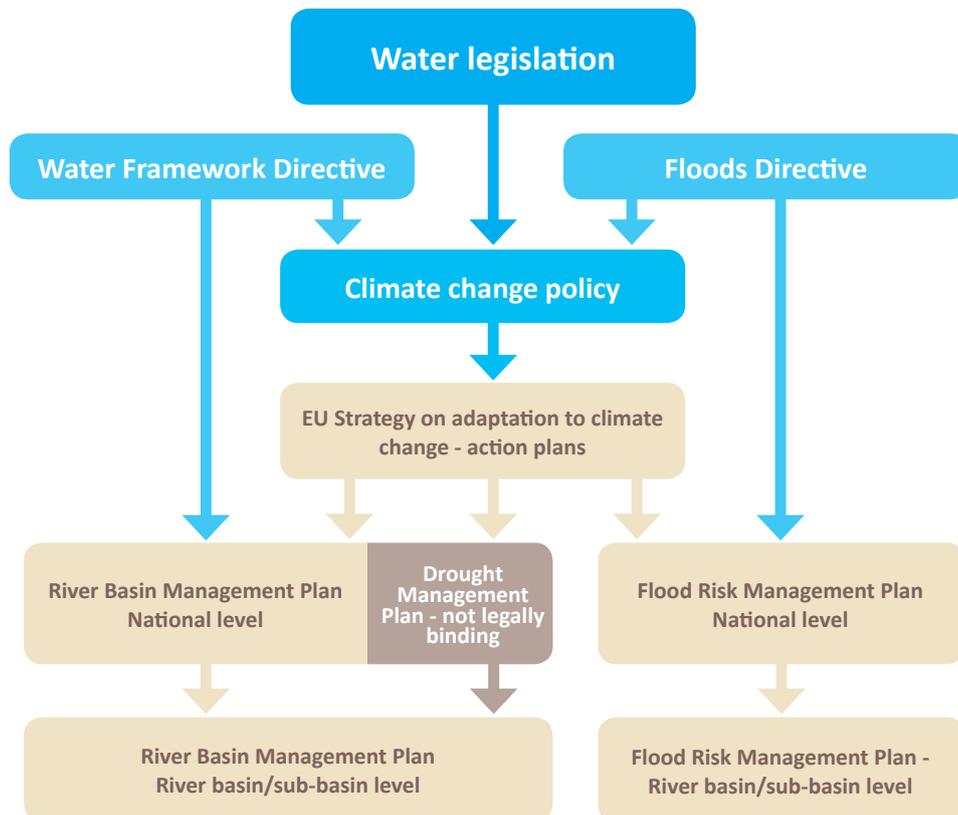
<sup>3</sup> Schmidt, G. & C. Benítez-Sanz (2012): Topic report on: Assessment of Water Scarcity and Drought aspects in a selection of EU River Basin Management Plans. Study by Intecsa-Inarsa for the European Commission (under contract “Support to the implementation of the Water Framework Directive (2000/60/EC)” (070307/2011/600310/SER/D.2)).

25 of these RBDs consider both as drivers for droughts. In addition to this, 18 RBMPs have reported other causes (not related with the meteorological nature of the phenomenon) such as past and current over-allocation of water, new water demands from agriculture and tourism or water use technologies that do not foster efficient water use. Some RBMPs do apparently not include information on the causes for droughts, although the RBDs are said to be affected by this phenomenon. These results of the RBMPs screening exercise are not consistent with sound planning practices.

As a response to gaps in WFD implementation, the EC has adopted the **Water Scarcity and Drought Policy COM (2007)414**. It was a significant step to address both **water scarcity and drought** in current water policy. The EC Communication identified key policy areas, specifically:

- improve water efficiency in agriculture and the urban development;
- better planning (demand management, land use planning, drought observatory and indicator development); and
- adequate implementation instruments, such as financing water efficiency, water pricing and water allocation mechanisms.

Although this Policy was adopted in a form of Communication (a recommendation character), several follow up reports create a good framework to establish Drought Management Plans (DMPs) at national/basin levels. The Communication gives priority to water savings (urban and industry sectors) and water efficiency measures (agriculture sector measures). It was called for further integrating water issues into all sectoral and environmental policies<sup>4</sup>. Some countries have already initiated special policies to combat droughts (Slovakia and Czech Republic as examples).



**Figure 1: Integrated water management – planning process in the context of the Water Framework Directive and Floods Directive** (Source: Global Water Partnership Central and Eastern Europe (2015), Guidelines for the preparation of Drought Management Plans in the context of the EU Water Framework Directive)

The **Floods Directive (2007/60/EC)** is an instrument to promote an integrated approach to the management of flood risk by improving water storage capacity and conserving water in natural system. Among the important requirements of the Floods Directive is the identification of areas of potential flood risk (Article 4). The Directive provides for better environmental options of land use, improve natural water storage capacities among other requirements. Thus, the Directive might inspire and support the knowledge and research in climate change. The interconnection between flood risk management planning and river basin management planning is shown in Figure 1.

<sup>4</sup> Kampragou E. and all, (2011), Towards the harmonization of water related policies for managing drought risks across the EU, Environ Sci Policy 14(7):815-824.

Some other EU water related directives might be referenced for drought policies. These are the **Ground Water Directive (2006/118/EC)** and **Drinking Water Directive (98/83/EC)**. Although, both directives are strong in provisions to improve water quality parameters, they lack any connection to water quantity. Requirements related to monitoring might be useful when assessing drought management measures, however, it is questionable, how monitoring data are processed in terms of water quantity. Also, these directives do not address possible suspension of water use (ground water and / or processed drinking water) in periods of drought.

## DETAILED ANALYSIS

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### Water Framework Directive (2000/60/EC)

Although the WFD itself does not define drought and does not directly address droughts, since it is a framework regulation, one of its purposes is to contribute to mitigating the effects of floods and droughts (Article 1(e)). The WFD aims to achieve primarily a good status of waters, which is a qualitative goal in terms of surface waters, while a quantitative and a qualitative goal for groundwater bodies. However, even in the case of surface water, quality is frequently associated with quantity (lack of sufficient volumes of water create ecological and/or chemical problems), therefore water volumes play a key role in river basin management under the WFD. Droughts represent a systematic threat that makes the achievement of the good status of a water body more difficult and costly and if it persists it can question the sustainability of the reference area from where the good status of a water body is derived. A potential change in drought frequency should be viewed as an external condition that the WFD process has to integrate at the review cycles.

The WFD contains several provisions dealing with quantitative aspects which are connected with water scarcity problems. However, legally binding requirements focused specifically on solving drought issues are not included. Despite this fact, the WFD is a rather flexible instrument, enabling the integration of drought issues into the context of integrated water management. According to Article 4 of the WFD, the preventive and mitigating measures needed for reducing drought impacts can or should be included in RBMPs; and become a part of a programme of measures for achieving environmental objectives. Furthermore, Article 13 (5) of the WFD states: „River basin management plans may be supplemented by the production of more detailed programmes and management plans for sub-basin, sector, issue, or water type, to deal with particular aspects of water management.“

River basin management plans (RBMP) provide a good platform for the development of drought management plans. The WMO-GWP CEE Integrated Drought Management Programme addressed this and developed a special *Guidelines for development of the Drought Management Plan as part of the RBMP*. The document concludes that the WFD offers the potential to address drought consequences and water scarcity issues. There are many links between climate change adaptation measures related to water scarcity and droughts and the WFD environmental objectives, such as good groundwater quantitative status which ensures a balance between abstractions and groundwater recharge. Another is the WFD requirement of achieving good ecological status for surface waters and the establishment of minimum water flows on which aquatic life depends. Measures to achieve these objectives must be reported in the RBMPs.

The Policy Review for Water Scarcity and Droughts integrated into the “Blueprint to safeguard European waters”<sup>5</sup> was presented by the Commission by November 2012. A set of completed studies helped bridging important knowledge gaps as regards water scarcity & droughts in the EU and assessed what measures are needed to improve water efficiency in various sectors: agriculture, buildings, water distribution networks, product labelling.

### Floods Directive (2007/60/EC)

The Floods Directive mainly deals with flood risk assessment, mapping and flood risk management plans, it barely and only indirectly supports drought management. Increasingly utilised measures for flood risk management include more space for rivers, restoration of floodplains, retention of some of the excess water carried by floods. These options can contribute to more balanced local water conditions, and thus mitigate the adverse impacts of droughts.

**Water Communication on water scarcity and droughts COM (2007) 414, supplemented by a 2012 review of the European WS&D Policy (COM(2012) 672)**

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<sup>5</sup> [http://ec.europa.eu/environment/water/blueprint/index\\_en.htm](http://ec.europa.eu/environment/water/blueprint/index_en.htm)

Within the communication no formal requirements are imposed, it is a guidance rather than a legally binding document. However, all five criteria (see point 1.2 Methodology above) are addressed in specific parts of the document. It promotes ideas, policy options and a framework to address water scarcity and droughts, but in practical terms its impact has so far been limited: „The [2012] review concludes that the overall objective of the Water Scarcity & Droughts (WS&D) policy - to revert the WS&D trends - has not been achieved, even if progress has taken place in implementing the 7 policy instruments identified in the Commissions Communication from 2007” ([http://ec.europa.eu/environment/water/quantity/scarcity\\_en.htm](http://ec.europa.eu/environment/water/quantity/scarcity_en.htm)).

Some of the promoted policy orientations are already transposed into legal requirements by other directives, most importantly „Putting the right price tag on water” which is in line with the cost recovery requirement of the WFD (Article 9). More effective implementation of the WFD would contribute to the water saving goal of the Communication on WS&D. Moreover, water prices that recover costs (and reflect scarcity when the latter exists) would contribute to some of the other policy goals spelled out by the Communication: land use planning (2.2.1) would be enhanced by price signals just as much as formal planning priorities, investments into additional water supply infrastructure (2.4) could be avoided or delayed, water efficient technologies and practices (2.5) could be incentivised, just as the expansion of a water-saving culture in Europe (2.6).

Other proposed (and partly implemented) measures of the communication are directly related to better planning, preparation for and handling of droughts. These measures include drought risk management plans, observatory and early warning systems, research efforts and improved data collection.

Since the 2007 adoption of the communication a number of studies have been prepared that provide more detailed guidance and strategic options related to the policy goals of the Communication. They are so called “Building blocks for the Water Scarcity & Droughts Policy review”

([http://ec.europa.eu/environment/water/quantity/building\\_blocks.htm](http://ec.europa.eu/environment/water/quantity/building_blocks.htm)). These studies can provide useful input to further policy development.

### Groundwater Directive 2006/118/EC

The main focus of the Groundwater directive is the quality of subsurface water bodies, it does not directly address quantitative issues. However, most groundwater resources – with the exception of deep subsurface water bodies – are closely related to surface water and are affected by droughts. Moreover, they can act as reserves when surface water supply becomes inadequate. As such, the quality of groundwater resources is also important from the perspectives of droughts. In case of droughts, surface water infiltration becomes weaker and contaminated water is not diluted enough. Therefore, droughts can pose a risk to the quality of groundwater resources. Furthermore, the quality of groundwater bodies that can be used as emergency water supplies to mitigate droughts is also of elementary importance. Thus, it can be claimed that the groundwater directive has a supporting role for drought management, although this role has a notably lower significance than the WFD.

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## 2.2. AGRICULTURE

Drought affects the production of arable crops and animal feed, which could have an impact on farmers’ income, increase their input costs and potentially give rise to animal welfare issues, if there is a shortage of fodder later in the year. The **EU Common Agriculture Policy** (CAP) undertook several reforms to support farmers. Recent ones relate to greening payments (to encourage farmers to introduce sustainable farming practices), and mainstream climate change adaptation and mitigation measures (those protecting against floods, droughts and fires). Each EU member state is required to elaborate Rural Development Programme that encourage farmers to conserve and enhance environmental features. These measures (such as cultivation of legumes, organic farming methods, and reduction of pesticide application) indirectly contribute to reduction of drought and water scarcity and improve soil quality. However, the CAP only minimally offers legislative instruments to address drought. Contrary, the CAP is tailored to financially support robust agriculture production that impact and cause the pressure on water resources. The EC has introduced the **MARS bulletins** (Monitoring Agricultural ResourceS) to provide monthly bulletins forecasting crop yields to support the CAP. The **European Drought Observatory** (EDO) provides timely and consistent information on droughts in Europe. In EDO a series of drought indicators for the entire European continent are available. These indicators are based on meteorological and satellite data, as well as on hydrological simulation models, thus allowing mapping and tracing the evolution of ongoing droughts.

In 2018, the EC introduced two specific measures aimed at helping farmers tackle drought. These measures are to help farmers in cash (direct payments to be received in advance) and derogate from specific greening requirements to allow and to be used to produce animal fodder.

## DETAILED ANALYSIS

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### Common Agricultural Policy

The Common Agricultural Policy (CAP) has identified three priority areas for action to protect and enhance the EU's rural heritage:

- biodiversity and the preservation and development of 'natural' farming and forestry systems, and traditional agricultural landscapes;
- water management and use;
- dealing with climate change.

Agriculture is one of the largest water demanding sectors (one third of total water use) in Europe and therefore water scarcity and droughts can cause significant economic impacts on agricultural activities. On the other hand, it is a source of pressure on water resources, for example through drying of wetlands, nutrient pollution affecting rivers, etc. However, the CAP remains the primary instrument for financial support for agriculture and has in the past often led to increased pressures on water usage from this sector thus exacerbating water scarcity, in particular through the subsidies to water-intensive crops.

CAP addresses EU's water policy objectives, both at strategic and implementation levels mainly through two instruments which have positive impact in supporting the policy objectives to improve water quantity and quality:

- **cross-compliance**, a mechanism linking certain CAP payments with specific environmental requirements, and
- **the rural development fund**, which provides for financial incentives for actions going beyond compulsory legislation to improve water quality.

The CAP only minimally offers financial and legal instruments to address drought.

The CAP ensures that its rules are compatible with environmental requirements and that CAP measures promote the development of agricultural practices preserving the environment and safeguarding the countryside.

Four main regulations govern the CAP, covering:

- direct support: [Regulation \(EU\) No 1307/2013](#) establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy;
- market measures: [Regulation \(EU\) No 1308/2013](#) establishing a common organisation of the markets in agricultural products;
- rural development: [Regulation \(EU\) No 1305/2013](#) on support for rural development by the European Agricultural Fund for Rural Development (EAFRD);
- horizontal issues: [Regulation \(EU\) No 1306/2013](#) on the financing, management and monitoring of the common agricultural policy.

The European Common Agricultural Policy focuses primarily on the agricultural perspective to water scarcity and drought, though it also has implications within the water management perspective as well. Member states have a degree of autonomy in applying the CAP at the national and regional level. Forestry is an integral part of rural development. The sustainable and climate friendly land use should include forest area development and sustainable management of forests. During the 2007-2013 programming period, a variety of measures covered different types of support for forestry investments and management.

The water-related rural development measures focus mainly on water use and water pollution prevention and reduction measures. Therefore, it does not address the issue of drought prevention. To address the issue of drought, both water and land ecosystems should be involved. Thus, sustainable land management practices that increase the resilience of the farming systems have a large potential in contributing to drought prevention and reduction.

The CAP has undergone several waves of reforms, with the latest reform decided in 2013 and implemented in 2015.

**The European Innovation Partnership for Agricultural Productivity and Sustainability (EIP-AGRI)** has been launched in 2012 to contribute to the European Union's strategy 'Europe 2020' for smart, sustainable and inclusive growth. This strategy sets the strengthening of research and innovation as one of its five main objectives and supports a new interactive approach to innovation: European Innovation Partnerships.

EIP-AGRI works to foster competitive and sustainable farming and forestry that 'achieves more and better from less'. It contributes to ensuring a steady supply of food, feed and biomaterials, developing its work in harmony with the essential natural resources on which farming and forestry depend.

EIP-AGRI Operational Groups can be funded under the RDPs and are project based. They tackle a certain (practical) problem or opportunity which may lead to an innovation and contribute to achieving the programme's objectives. The EU member states or regions decide on the precise conditions to support innovation projects through their Rural Development Programmes, which operate in a given region or country. EIP Operational Groups can benefit from an increased EU co-financing rate. More info at: <https://ec.europa.eu/eip/agriculture/en>.

### 2.3. CLIMATE CHANGE

In the context of climate change, drought is mentioned several times in European legislation, however there are no directives or policies especially dedicated to it. As climate change has impact on the components of the hydrological cycle one would expect that the problem would be addressed more efficiently. Drought is one of the first consequences of climate change that can already be seen in Europe and should be taken more seriously.

In many countries too much money has been spent to compensate the damage after drought events. Financially the adaptation measures – taken in advance on the basis of good national drought preparedness plan – are more efficient.

Moreover, significant economic losses and human fatalities associated with extreme weather events, such as heat waves, droughts and heavy precipitation, have been registered. As stated below the drought is mainly mentioned in the context of extreme events as possible consequence but not in combination with mitigation strategies or obligation for countries. There is a need for a directive that would address drought as a problem that is occurring far more frequently and intensively due to climate change and as such needs to be observed, analysed, and mitigated. It has to be shown, that the problem is arising from higher temperatures and changes in precipitation pattern in many EU countries that need to act wise and to be prepared in advance.

In April 2013 the European Commission adopted an **EU Strategy on Adaptation to Climate Change**<sup>6</sup> which has been welcomed by the EU Member States. The strategy aims to make Europe more climate-resilient. By taking a coherent approach and providing for improved coordination, it will enhance the preparedness and capacity of all governance levels to respond to the impacts of climate change.

However, adaptation is in most cases still at an early stage, with relatively few concrete measures on the ground. Some Member States have developed sector-specific plans to cope with heat waves and droughts, but only a third carried out a comprehensive vulnerability assessment to underpin policy. Monitoring and evaluation are proving to be particularly difficult, as indicators and monitoring methodologies have hardly been developed.

In December 2019 the International Commission for the Protection of the Danube River identified the “Effects of climate change (drought, water scarcity, extreme hydrological phenomena and other impacts)” as a Significant Water Management Issue.

The relevant ICPDR document points out that both drought and water scarcity pose significant risks to the stability of water dependent aquatic and terrestrial ecosystems and may influence the achievement of the good status of all waters. Furthermore, both have severe economic consequences for the society and for most economic sectors.

In December 2019 the European Commission presented its European Green Deal, an ambitious package of measures that should enable European citizens and businesses to benefit from sustainable green transition.

According to this Strategy EU will be climate neutral in 2050. The Commission will propose a European Climate Law turning the political commitment into a legal obligation and a trigger for investment.

#### Related documents:

- European Green Deal: [https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal\\_en](https://ec.europa.eu/info/strategy/priorities-2019-2024/european-green-deal_en)
- ICPDR (2019): Interim Overview: Significant Water Management Issues in the Danube River Basin District, Document number: [IC220](#).
- Communication: “An EU Strategy on Adaptation to Climate Change”, [COM \(2013\) 216](#);
- Impact Assessment (vol. I and II), Commission Staff Working Documents, [SWD \(2013\) 132](#) and [SWD \(2013\) 133](#);
- Green Paper on the prevention and insurance of disasters, [COM \(2013\) 213](#);
- The Policy Review for Water Scarcity and Droughts is integrated into the “Blueprint to safeguard European waters” was presented by the Commission in November 2012. A set of completed studies helped bridging important knowledge gaps as regards water scarcity and droughts in the EU and assessed what measures are needed to improve water efficiency in various sectors: agriculture, buildings, water distribution networks, product labelling.<sup>7</sup>

<sup>6</sup> [https://ec.europa.eu/clima/sites/clima/files/docs/eu\\_strategy\\_en.pdf](https://ec.europa.eu/clima/sites/clima/files/docs/eu_strategy_en.pdf)

<sup>7</sup> [http://ec.europa.eu/environment/water/blueprint/index\\_en.htm](http://ec.europa.eu/environment/water/blueprint/index_en.htm)

### The Union Civil Protection Mechanism (“the Union Mechanism”)

Introduced by the Decision No 1313/2013/EU of the European Parliament and of the Council of 17 December 2013, amended by Decision (EU) 2019/420 of the European Parliament and of the Council of 13 March 2019 (UCPM) shall aim to strengthen the cooperation between the Union and the Member States and to facilitate coordination in the field of civil protection in order to improve the effectiveness of systems for preventing, preparing for and responding to natural and man-made disasters. The Union Mechanism should include a general policy framework for Union actions on disaster risk prevention, aimed at achieving a higher level of protection and resilience against disasters by preventing or reducing their effects and by fostering a culture of prevention, including due consideration of the likely impacts of climate change and the need for appropriate adaptation action. Drought is mentioned as extreme event and Member States could **include drought** inside the implementation programmes. National Risk Assessment of 16 UCPM countries identify drought as a significant climatological risk ([SWD\(2017\) 176 final](#)).

From 2001<sup>8</sup> to 2019, UCPM has responded to over 330 requests for assistance inside and outside the EU.

## 2.4. ENERGY, INDUSTRY, TRANSPORT

In 2016, the European Parliament has approved the ratification of the Paris Agreement. This is a clear political declaration to turn climate ambition into climate action towards low carbon future. The EU policy framework for climate and energy policy in the period from 2020 to 2030 together with EU Energy Security Strategy, Action Plan for the Circular Economy, and EU Transport Roadmap address issues of CO<sub>2</sub> emission reductions in the key sectors of energy, industry and transport. The essential objectives of these policies include:

- putting energy efficiency first, and
- achieving global leadership in renewable energies.

About one dozen legislative documents are developed to reduce CO<sub>2</sub> emissions. The in-depth analysis has been recently published to support the EU effort in meeting the Paris Agreement. The Clean Planet for All analysis is focused on climate change mitigation with little adaptation. Energy efficiency must be increased at each and all stages of the energy chain, from generation to final consumption. Energy produced from renewable energy sources should be at least 32% by the year 2030 as requested by a new Renewable Energy Directive (2018/2001/EU). Renewable energy sources include wind, solar (solar thermal and solar photovoltaic) and geothermal energy, ambient energy, tide, wave and other ocean energy, hydropower, biomass, landfill gas, sewage treatment plant gas, and biogas. The EU member states should develop their national plans to achieve the target of 32%. It is obvious that the replacement of CO<sub>2</sub> emitting sources with hydropower electricity generation should be carefully considered as drought events might jeopardize the hydropower plant operation. Thus, countries are encouraged to adopt the national policies that establish a diversified energy system. It can help reduce the negative effects of drought on hydropower. Another problem is the production of biofuel from so called indirect land use changes (generation of energy from wood, wetlands, agriculture products from croplands). In order to mitigate the negative direct impact of such production, the EU reinforces the sustainability criteria of bioenergy (see more in the Report on the status of production expansion of relevant food and feed crops worldwide (2019)).

## DETAILED ANALYSIS

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### Renewable Energy Directive (2009/28/EC) amended by Directive 2018/2001/EU

The original renewable energy directive (2009/28/EC) establishes an overall policy for the production and promotion of energy from renewable sources in the EU. It requires the EU to fulfil at least 20% of its total energy needs with renewables by 2020 – to be achieved through the attainment of individual national targets. All EU countries must also ensure that at least 10% of their transport fuels come from renewable sources by 2020.

In December 2018, the revised renewable energy directive 2018/2001/EU entered into force, as part of the Clean energy for all Europeans package, aimed at keeping the EU a global leader in renewables and, more broadly, helping the EU to meet its emissions reduction commitments under the Paris Agreement.

The new directive establishes a new binding renewable energy target for the EU for 2030 of at least 32%, with a clause for a possible upwards revision by 2023.

Under the new Governance regulation, which is also part of the Clean energy for all Europeans package, EU countries are required to draft 10-year National Energy & Climate Plans (NECPs) for 2021-2030, outlining how they will meet the new 2030 targets for renewable energy and for energy efficiency.

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<sup>8</sup> A Community Civil Protection Mechanism was established in 2001

Member States needed to submit a draft NECP by 31 December 2018 and should be ready to submit the final plans to the European Commission by 31 December 2019.

Most of the other new elements in the new directive need to be transposed into national law by Member States by 30 June 2021.

The Directive 2009/28/EC specifies national renewable energy targets for 2020 for each country, taking into account its starting point and overall potential for renewables.

EU countries set out how they plan to meet these 2020 targets and the general course of their renewable energy policy in national renewable energy action plans.

Progress towards national targets is measured every two years when EU countries publish national renewable energy plans.

### **Energy Efficiency Directive 2012/27/EU (EED)**

**Energy Efficiency Directive** is a European Union Directive which mandates energy efficiency improvements within the European Union. It entered into force on 4 December 2012. The directive introduces legally binding measures to encourage efforts to use energy more efficiently in all stages and sectors of the supply chain. It establishes a common framework for the promotion of energy efficiency within the EU in order to meet its energy efficiency headline target of 20% by 2020. It also paves the way for further improvements thereafter.

The directive provides for the establishment of indicative national energy efficiency targets for 2020. Member States were to have submitted their National Energy Efficiency Action Plans (NEEAP) by 30 April 2014, outlining the measures they have implemented to improve energy efficiency and their expected and/or achieved energy savings. In addition, member states are required to report annually on progress towards their national targets. The policy requirements in the directive are minimum obligations and member states may introduce more stringent measures.

The Energy Efficiency Directive 2012/27/EU was preceded by the Energy Services Directive 2006/32/EC. This earlier directive contained a target of a 9% reduction in energy usage within 9 years of the directive coming into force. The earlier directive also required EU members to submit National Energy Efficiency Action Plans, with the first plan to be lodged by 30 June 2007.

### **Regulation (EU) 2018/1999 of the European Parliament and of the Council of 11 December 2018 on the Governance of the Energy Union and Climate Action**

Agreed as part of the Clean Energy for all Europeans package, the goals of the new regulation are:

- to implement strategies and measures which ensure that the objectives of the energy union, in particular the EU's 2030 energy and climate targets, and the long-term EU greenhouse gas emissions commitments are consistent with the Paris agreement;
- to stimulate cooperation between Member States in order to achieve the objectives and targets of the energy union;
- to promote long-term certainty and predictability for investors across the EU and foster jobs, growth and social cohesion;
- to reduce administrative burdens, in line with the principle of better regulation. This was done by integrating and streamlining most of the current energy and climate planning and reporting requirements of EU countries as well as the Commission's monitoring obligations;
- to ensure consistent reporting by the EU and its Member States under the UN Framework Convention on Climate Change and the Paris agreement, replacing the existing monitoring and reporting system from 2021 onwards.

The governance mechanism is based on integrated national energy and climate plans (NECPs) covering ten-year periods starting from 2021 to 2030, EU and national long-term strategies, as well as integrated reporting, monitoring and data publication. The transparency of the governance mechanism is ensured by consulting wide public on the NECPs.

The regulation on the governance of the energy union and climate action emphasises the importance of meeting the EU's 2030 energy and climate targets and sets out how EU countries and the Commission should work together, and how individual countries should cooperate, to achieve the energy union's goals. It takes into account the fact that different countries can contribute to the Energy Union in different ways.

Under the regulation, each Member State was required to submit a draft NECPs by the end of 2018, which was then assessed by the Commission.

On 18 June 2019, as mandated under the governance regulation, the Commission published its global assessment of the cumulative impact of these draft plans. This included recommendations for each Member State to improve their draft plans in order to meet the EU targets. The final NECPs must be submitted by the end of 2019.

Communication (COM/2015/0614 final) from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions - Closing the loop - An EU Action Plan for the Circular Economy

The European policy related to industry aims to ensure coherence between industrial, environmental, climate and energy policy to create an optimal business environment for sustainable growth, job creation and innovation. To support this, the existing policies has established an ambitious agenda to transform EU economy into a circular one, where the value of products and materials is maintained for as long as possible, waste and resource use are minimized bringing major economic benefits. The Commission also supports European industry in the move to a climate-neutral economy and improves the energy efficiency of products by promoting ecodesign.

Although the Communication is not mentioning directly drought as its objective it deals with water reuse which is an important element for drought management.

### **Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and type approval for internal combustion engines for non-road mobile machinery**

This Regulation establishes for specified engines of non-road vehicles emission limits for gaseous and particulate pollutants as well as the administrative and technical requirements relating to EU type-approval. This Regulation also lays down certain obligations in relation to non-road mobile machinery in which the specified engine is being, or has been, installed, as regards the emission limits for gaseous and particulate pollutants from such engines. This Regulation also establishes the requirements for the market surveillance of those engines.

### **Directive 2009/30 of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions**

This Directive sets, in respect of road vehicles, and non-road mobile machinery (including inland waterway vessels when not at sea), agricultural and forestry tractors, and recreational craft when not at sea, technical specifications on health and environmental grounds for fuels to be used with positive ignition and compression-ignition engines, taking account of the technical requirements of those engines and a target for the reduction of life cycle greenhouse gas emissions. One very important provision of this Directive is related to the introduction of sustainability criteria for biofuels and the verification of compliance with the sustainability criteria for biofuels.

## **2.5. NATURE AND BIODIVERSITY**

EU directives by nature are restricted in their scope. The increasing droughts threat is the result of a much more complex process than what the nature-related legislation in its current form can target. Droughts resilience in Europe is essentially constrained by the consequences of the land transformation accumulated through the history of the continent. The result is the weakening of the terrestrial water cycle, the land's ability to store and allocate water in the landscape to assimilate the seasonal solar energy surplus through biomass production and transpiration (precipitation recycling). The terrestrial water circulation is not constrained to the natural/nature protected areas, rather, it depends on the land use of the entire land surface, including agricultural areas and urban areas as well. Therefore, enhancing the entire landscape's (urban and non-urban) water storage and infiltration capacity could offer a solution that the current EU nature legislation is not capable of achieving<sup>9</sup>. Healthy ecosystems will be more resilient to climate change and so more able to maintain the supply of ecosystem services. The *Natura 2000* Network can play a vital role in helping society adapt to, and mitigate the impacts of climate change as well as the drought. One of the ambitions of the EU was to integrate the green infrastructure into the key policy areas. In 2016, the report on *Supporting the Implementation of Green Infrastructure* was published by the EC to provide recommendations on how to incorporate green infrastructure for alleviating disaster risks including drought and water scarcity.

<sup>9</sup> Ellison et al; Trees, forests and water: Cool insights for a hot world. In: Global Environmental Change 43 (2017) 51–611

## DETAILED ANALYSIS

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### **Habitats Directive: 92/43/EEC**

The Habitats Directive has a focus on species and habitats, but does not address environmental conditions such as water availability. The five criteria related to drought management support (see 1.2 Methodology) are not covered by the Directive.

There are two aspects of the Directive that may be marginally related to drought management:

- There is a requirement on setting up a system of surveillance of the conservation status of the natural habitats and species covered by the Directive (Article 11). Under such assessment specific bioindicators may provide a signal on water pollution and indirectly also water shortage. This connection, however, is rather weak and indirect.
- The Natura 2000 network may contribute to the regulation of water extremities, and as such, it may play a role in mitigating droughts.

Nevertheless, neither of these aspects have been judged as critical enough to support drought management policies.

### **Birds Directive: 2009/147/EC**

The Birds Directive exhibits some similarity to the Habitats Directive in that it designates the protection of habitats important for the bird species covered by the Directive as a priority, but its overall link to drought management is even weaker than in the case of the Habitats Directive.

### **Regulation 1143/2014 on invasive alien species**

Invasive alien species pose various threats to biodiversity and related ecosystem services, one of which is the alteration of habitats, which, on the other hand, play a role in the local water cycle, including water retention and water circulation. The Regulation itself, however, does not offer much in the way of supporting drought management.

### **Biodiversity strategy to 2020 (COM(2011)244)**

Similarly to other communications, the Biodiversity strategy is not a legally binding document, but it provides a vision that has elements related to drought management.

### **Communication on Green Infrastructure COM (2013) 249**

The Communication on Green Infrastructure (GI) does not impose legal requirements on Member States, rather, it describes how Green Infrastructure concepts can be integrated to EU policies to achieve policy goals in a more cost-effective way, while also generating other benefits. GI is often cheaper than grey infrastructure, therefore it makes adaptation to mitigation of natural disasters (including droughts) smoother and more affordable.

Green Infrastructure can play an important role in mitigating droughts. In the urban setting it can reduce adverse heat island effects, while rural GI can contribute to the regional water cycle by retaining increasing volumes of water in ecosystems and making them available during periods of water scarcity. By consciously integrating green infrastructure concepts into spatial planning and territorial development, the environment becomes more robust, also in terms of drought resilience.

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Table 1: The evaluation chart

| Strategy/policy   | Existing Implementation instrument  | Criteria for justification how selected policy/document support drought management<br><i>not mentioned(-); generally addressed (0); support actions (+)</i> |   |  |   |  |
|---|---|---|---|--|---|--|
|   |   | Monitoring & data collection  | Incentives to water efficiency & circular economy | Knowledge production and research on drought preparedness and resilience | Operational measures to improve drought management (and to develop DMP) | Financial instruments to adapt/mitigate droughts |
| <b>Water</b>  |   |   |   |  |   |  |
| Water Framework Directive 2000/60/EC  | River Basin Management Plans  | +   | 0   | 0  | +   | 0  |
| Floods Directive 2007/60/EC   | Flood Risks Management Plans  | 0   | -   | 0  | 0   | -  |
| Water Communication on water scarcity and droughts COM (2007) 414, supplemented by a 2012 review of the European WS&D Policy (COM(2012) 672)  | Drought Risk Management Plan  | +   | +   | +  | +   | 0  |
| Groundwater directive 2006/118/EC   | River Basin Management Plans  | 0   | -   | -  | 0   | -  |
| <b>Climate Change</b>   |   |   |   |  |   |  |
| Regulation (EU) No 377/2014 establishing the Copernicus Programme...  | Copernicus Programme  | +   | -   | -  | -   | .  |
| General Union Environment Action Programme to 2020 'Living well, within the limits of our planet' (DECISION No 1386/2013/EU)  | - Water Framework Directive,<br>- Strategic Implementation Plan of the European Innovation - Partnership on Water                   | -   | 0   | 0  | -   | -  |
| REGULATION (EU) No 1293/2013 on the establishment of a Programme for the Environment and Climate Action (LIFE); REGULATION (EU) No 1291/2013 on establishing Horizon 2020 - the Framework Programme for Research and Innovation (2014-2020) | Programme for the Environment and Climate Action (LIFE) Horizon 2020  | -   | -   | 0  | 0   | -  |
| Regulation (EU) No 525/2013 on a mechanism for monitoring and reporting greenhouse gas emissions and for reporting other information at national and Union level relevant to climate change   |   | -   | -   | -  | +   | -  |
| THE NEW EUROPEAN CONSENSUS ON DEVELOPMENT; OUR WORLD, OUR DIGNITY, OUR FUTURE' (2017/C 210/01);   |   | -   | -   | 0  | -   | -  |
| COMMISSION REGULATION (EU) No 1253/2013 on implementing Directive 2007/2/EC as regards interoperability of spatial data sets and services   | Directive 2007/2/EC   | +   | -   | -  | -   | -  |
| REGULATION (EU) No 661/2014 establishing the European Union Solidarity Fund   | European Union Solidarity Fund  | -   | -   | -  | -   | +  |
| DECISION No 1313/2013/EU on a Union Civil Protection Mechanism  | (Drought Risk Management Plans are mentioned, but its ambiguous if they can be considered as an instrument under the communication) | +   | -   | +  | +   | 0/+  |
| <b>Agriculture &amp; Forestry</b>   |   |   |   |  |   |  |
| Common Agricultural Policy (CAP)  |   | +   | +   | +  | +   | +/-0   |
| REGULATION (EU) No 1305/2013 on support for rural development by the European Agricultural Fund for Rural Development (EAFRD)   | Rural Development Programmes performed by MS  | +   | +   | +  | +   | +  |
| REGULATION (EU) No 1306/2013 on the financing, management and monitoring of the common agricultural policy  | MSs are responsible for the implementation and primary control of payments to farmers   | +   | -   | 0  | +   | +  |

| Strategy/policy   | Existing Implementation instrument  | Criteria for justification how selected policy/document support drought management<br><i>not mentioned(-); generally adressed (0); support actions (+)</i> |   |  |   |  |
|---|---|--|---|--|---|--|
|   |   | Monitoring & data collection   | Incentives to water efficiency & circular economy | Knowledge production and research on drought preparedness and resilience | Operational measures to improve drought management (and to develop DMP) | Financial instruments to adapt/mitigate droughts |
| <b>Agriculture &amp; Forestry</b>   |   |  |   |  |   |  |
| REGULATION (EU) No 1307/2013 establishing rules for direct payments to farmers under support schemes within the framework of the common agricultural policy   | MSS are responsible for the implementation and primary control of payments to farmers | -  | -   | +  | +   | +  |
| REGULATION (EU) No 1308/2013 establishing a common organisation of the markets in agricultural products   | MSS are responsible for the implementation and primary control of payments to farmers | -  | -   | -  | -   | 0  |
| Communication on the European Innovation Partnership 'Agricultural Productivity and Sustainability - EIP  | project based under RD programmes and Horizon 2020                                    | 0  | 0   | 0  | 0   | 0  |
| EU agriculture and climate change European Parliament resolution of 5 May 2010 on EU agriculture and climate change (2009/2157(INI))  |   | -  | -   | +  | +   | +  |
| <b>Energy (including Hydropower generation)</b>   |   |  |   |  |   |  |
| Renewable energy directive 2009/28/EC (amended by 2018/2001/EU)   | National Renewable Energy Action Plan   | 0  | -   | -  | 0   | 0  |
| Energy Efficiency Directive 2012/27/EU (amended by 2018/2002/EC)  | National Energy Efficiency Action Plan  | -  | -   | -  | 0   | -  |
| Regulation (EU) 2018/1999 on the governance of the Energy Union and Climate Action  | Integrated National Energy and Climate Plans  | 0  | -   | -  | 0   | -  |
| <b>Industry</b>   |   |  |   |  |   |  |
| Communication (2015) 614 from the Commission to the European Parliament, the Council, the European Economic and Social Committee of Region -Closing the loop- An EU Action Plan for the Circular Economy  | Action Plan (including Annex)   | +  | +   | 0  | 0   | -  |
| <b>Transport</b>  |   |  |   |  |   |  |
| Regulation (EU) 2016/1628 of the European Parliament and of the Council of 14 September 2016 on requirements relating to gaseous and particulate pollutant emission limits and typeapproval for internal combustion engines for non-road mobile machinery |   | -  | -   | -  | -   | -  |
| Directive 2009/30 of the European Parliament and of the Council of 23 April 2009 amending Directive 98/70/EC as regards the specification of petrol, diesel and gas-oil and introducing a mechanism to monitor and reduce greenhouse gas emissions        |   | 0  | -   | -  | 0   | -  |
| <b>Nature &amp; Biodiversity</b>  |   |  |   |  |   |  |
| Habitats Directive: 92/43/EEC   | Natura 2000 network   | -  | -   | -  | -   | -  |
| Birds Directive: 2009/147/EC  | ---   | -  | -   | -  | -   | -  |
| Regulation 1143/2014 on invasive alien species  | ---   | -  | -   | -  | -   | -  |
| Biodiversity strategy to 2020 (COM(2011)244)  | ---   | 0  | -   | 0  | -   | 0  |
| Communication on Green Infrastructure COM(2013) 249   | ---   | 0  | -   | 0  | -   | -  |

### 3. Conclusions and Recommendations

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Managing drought needs to be reconceptualised in the light of climate change, taking into account that drought is a slow onset disaster. It takes long time: months or years to become disastrous, but may cause more severe damage to humans and environment than many rapid onset disasters. The amount of damage is increasing therefore there is an urgent need to move from crisis management to drought risk reduction policy. In other words a shift from managing short term drought episodes to the long-term adjustments in water use efficiency is inevitable. This new approach requires multi-party conversation among public and private hydrological and climate change experts, water managers, those responsible for agricultural policy and major water users such as irrigators and urban water suppliers.

As there is no EU directive or policy especially dedicated to drought the current legislation and sectoral policies and instruments – binding or not – in the fields of water, agriculture, climate change, energy, industry, transport, nature protection, biodiversity should be integrated. Several of them are partially or at least marginally related to drought management and can support drought management policies. They have been analysed by experts on the basis of five criteria (monitoring; incentives to water efficiency and circular economy; knowledge and research; measures to improve drought management and to develop drought management plans; financial instruments). The major findings are mentioned below.

Agriculture is one of the largest water demanding sectors. The European Common Agricultural Policy (CAP) focuses primarily on the agricultural perspective to water scarcity and drought, though it also has implications within the water management perspective as well. The CAP reform may help mainstream climate change adaptation and mitigation measures. Sustainable land management practices that increase the resilience of the farming systems have a large potential in contributing to drought prevention and reduction.

The EU Climate Change Adaptation Strategy, aiming to make Europe more climate-resilient, focuses on building response capacity, prevention and on limiting the damage as it occurs. By taking a coherent approach and providing for improved coordination, it will enhance the preparedness and capacity of all governance levels to respond to the impacts of climate change. Individual countries defined a set of measures to address climate change impact, including those which mitigate drought situations.

The EU policy framework for climate and energy policy addresses issues of CO<sub>2</sub> emission reductions in the key sectors of energy, industry and transport. The EU Action Plan for the Circular Economy deals with water reuse which is an important element for drought management.

The Natura 2000 network may contribute to the regulation of water extremities, and as such, it may play a role in mitigating droughts. The Biodiversity strategy to 2020 provides a vision that has elements related to drought management. Other directives and regulation related to nature protection have only minor link to this issue.

Green Infrastructure can play an important role in mitigating droughts, both in urban and rural areas. By consciously integrating green infrastructure concepts into spatial planning and territorial development, the environment becomes more “robust”, also in terms of drought resilience.

The Water Framework Directive contains several provisions dealing with quantitative aspects which are connected with water scarcity problems. However, legally binding requirements focused specifically on solving drought issues are not included. Despite this fact, the WFD is a rather flexible instrument, enabling the integration of drought issues into the context of integrated water resources management. The joint Integrated Drought Management Programme of WMO and GWP CEE addressed this and developed special Guidelines for the development of the Drought Management Plan as part of the RBMP. The document concludes that a WFD compatible river basin management plan is the basic tool for addressing water scarcity and drought issues assessed in connection with, and impacted by, climate change scenarios. Furthermore, the RBMPs may be supplemented by the production of more detailed programmes and management plans to deal with particular aspects (e.g. drought) of water management. The links between the preparation of drought management plans and river basin management plans may have a synergistic effect in achieving environmental objectives. A direct connection with EU water policy can facilitate the development of national drought policy based on the principles of risk reduction and the improved implementation of the Water Framework Directive. The European Commission encourages Member States to better integrate drought risk management and climate change aspects in their future RBMPs.

Recent developments, like the presentation of the European Green Deal by the European Commission and the adoption of the effects of climate change including i.a. drought and water scarcity as Significant Water Management Issue by the ICPDR, might give further impetus to combat drought and water scarcity.



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