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## **Water deficits in the European Union as a consequence of climate change – legal and ecological aspects**

### **Introduction**

Climate change is one of the most pressing environmental issues facing the world today. It is a long-term trend in the Earth's climate, which has occurred periodically in the past, the most recent of which is thought to have occurred around 10,000 years ago during the melting of the Pleistocene ice sheets. The current trend is driven by multiple factors including the greenhouse effect and global warming. While there are natural causes of climate change, such as volcanic eruptions, human activities, particularly the burning of fossil fuels and raising of livestock, are the main drivers<sup>1</sup>.

The single most prominent effect of climate change is an increase in air temperature. The Intergovernmental Panel on Climate Change (IPCC) formed at the UN in a 1990 report concluded that there would be a 1.5–4.5°C increase in Earth's air temperature in 2030, a figure that was updated in a subsequent IPCC 1993 report to the value of 1–3.5°C in 2100. The most recent IPCC report concluded that the annual global temperature is likely to be at least 1°C higher than in the pre-industrial period (compared to the average of the 1850–1900 period) in each of the next five years, and is expected to fall within the range of 0.9 to 1.6°C<sup>2</sup>. The temperature rise may trigger a series of further environmental changes. These include the melting of Antarctic glaciers, leading to the formation of small bodies of water populated by species characteristic of

<sup>1</sup> A. Kalinowska, *Ekologia – wybór przyszłości*, Warszawa 1993; Z. Kundzewicz, K. Juda-Rezler, *Zagrożenia związane ze zmianami klimatu*, „Nauka” 2010, No. 4, p. 69.

<sup>2</sup> IPCC, *Climate Change 2022: Mitigation of Climate Change*, Working Group III contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, [https://report.ipcc.ch/ar6/wg3/IPCC\\_AR6\\_WGIII\\_Full\\_Report.pdf](https://report.ipcc.ch/ar6/wg3/IPCC_AR6_WGIII_Full_Report.pdf) (accessed: 25.11.2022).

the temperate climate, such as blue-green algae causing extensive growths called blooms<sup>3</sup>. Other effects of climate change include rising sea levels and oceans that can submerge parts of continents located in depressed areas. Finally, global warming has contributed to terrestrial biospheric changes, a shift of climate zones towards the poles in both hemispheres, an extension of the growing season by two days per decade on average since the 1950s in the northern hemisphere, as well as the semi-desertification of areas and ensuing water deficits<sup>4</sup>.

The issue of water deficits has been addressed at the UN, with particular reference to the resolutions passed, starting with Resolution 64/292 in 2010 and ending with Resolution 2187 in 2021<sup>5</sup>. The former states in its Preamble that water is essential for life, and the right to safe and clean drinking water and sanitation is an essential right. Proper management of water resources plays a central role in ensuring the sustainable use of water and the preservation of the world's natural capital. Climate change means that the entire Mediterranean region of the EU and specific regions of Central Europe are now being regarded as water-scarce and semi-arid regions. On the other hand, Resolution 2187/2021 draws attention to the fact that global warming is a major cause of water scarcity, and the ongoing climate crisis, marked by increasing droughts, floods and torrential rains, is further exacerbating inequalities in water distribution.

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<sup>3</sup> J. Ciechanowicz-McLean, *Węzłowe problemy prawa ochrony klimatu*, „Studia Prawnoustrojowe” 2017, No. 37, pp. 8–24; N. Cannone, P. Convey, F. Malfasi, *Antarctic Specially Protected Areas (ASPAs): a case study at Rothera Point providing tools and perspectives for the implementation of the ASPA network*, „Biodiversity Conservation” 2018, Vol. 27, pp. 2641–2660; P. Lowry, N.R. Golledge, L. Menviel, A.N. Bertler, *Deglacial evolution of regional Antarctic climate and Southern Ocean conditions in transient climate simulations*, „Climate of the Past” 2019, Vol. 15, pp. 189–215; A. Świątecki, D. Górniak, K. Jankowska, M. Zdanowski, P. Borsuk, M. Żmuda-Baranowska, J. Grzesiak, *Effects of climate change on microbial community structure and function in the antarctic glacier lagoon*, „Papers on Global Change” 2012, Vol. 17, pp. 7–15; A. Świątecki, D. Górniak, M. Zdanowski, J. Grzesiak, T. Mieczan, *Polityczne i prawne aspekty prowadzenia badań naukowych w rejonach polarnych*, „Studia Prawnoustrojowe” 2019, No. 43, pp. 335–347; E. Zębek, A. Napiórkowska-Krzebietke, A. Świątecki, D. Górniak, *Biodiversity of periphytic cyanobacteria and algae assemblages in polar region: a case study of the vicinity of Arctowski Polish Antarctic Station (King George Island, Antarctica)*, „Biodiversity and Conservation” 2021, 3.07.2021, <https://doi.org/10.1007/s10531-021-02219-2>.

<sup>4</sup> IPCC, *Climate Change 2022: Mitigation of Climate Change...*

<sup>5</sup> Resolution No. 64/292 adopted by the General Assembly on 28 July 2010 The human right to water and sanitation; Resolution No. 68/157 adopted by the General Assembly on 18 December 2013 The human right to safe drinking water and sanitation; Resolution No. 45/8 adopted by the Human Rights Council on 6 October 2020 The human rights to safe drinking water and sanitation; Resolution No. 48/13 adopted by the Human Rights Council on 8 October 2021 The human right to a clean, healthy and sustainable environment; European Parliament resolution of 5 October 2022 on access to water as a human right – the external dimension (2021/2187(INI)), [https://www.europarl.europa.eu/doceo/document/A-9-2022-0231\\_PL.html](https://www.europarl.europa.eu/doceo/document/A-9-2022-0231_PL.html) (accessed: 23.11.2022).

Water deficits have been reported in Europe, mainly in the Mediterranean region. According to the European Environment Agency (EEA) report, water resources in Europe face the risk of water scarcity and drought. Southern European countries continue to suffer from severe water shortages, with increasing deficits occurring in the north of the continent as well. The severity and frequency of droughts are projected to increase alongside climate change, adding to water scarcity, especially in the summer months. Furthermore, water resources are being overexploited, with a major impact on the quality and quantity of remaining water and on ecosystems. It is, therefore, urgent to decrease demand, minimise the amount of water abstracted and increase the efficiency of water use<sup>6</sup>. In nearly half of the EU countries, water resources are worryingly low (less than 3,000 m<sup>3</sup>/person), which includes Poland, Malta, Cyprus and the Czech Republic, where they are below the water security level. According to the UN, the threshold below which a country is considered at risk of water scarcity is 1700 m<sup>3</sup> per capita. Poland ranks 24th in the European Union in terms of renewable freshwater resources per capita, slightly ahead of the Czech Republic, Cyprus and Malta. Water supplies in Poland are relatively low, amounting to less than 1600 m<sup>3</sup>/M/year, and are additionally characterised by seasonal and area variability<sup>7</sup>. Thus, the problem of water shortages caused by climate change has reached a high level in Europe, including Poland, and requires comprehensive legal and organisational solutions to be developed.

The issues surrounding global phenomena adversely affecting the human living environment were recognised during the 1992 Rio Conference. The primary objective of this event was to identify the connection between a deteriorating environment and economic development leading to the likelihood of a global catastrophe, as well as to prompt international, regional and national action relevant to preserving the ecological balance<sup>8</sup>. Indeed, climate change can be viewed as a manifestation of adverse global changes negatively affecting both people's quality of life and the economy. The impetus for international action to address climate change has come from the realisation that human activities that cause greenhouse gas emissions can be damaging, and their effects span the globe, the results of such activities transcend national boundaries, and the damage they cause has a substantial environmental, social and economic price<sup>9</sup>. The literature recognises that the beginning of legal protection of the climate dates back to 1979, the first World Climate Conference. In

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<sup>6</sup> EEA Report No. 2/2009, *Water resources across Europe – confronting water scarcity and drought* EEA, Copenhagen, 2009, <https://www.eea.europa.eu/publications/water-resources-across-europe> (accessed: 4.11.2022)

<sup>7</sup> W. Domańska (ed.), *Ochrona środowiska 2021*, Warszawa 2021, p. 51.

<sup>8</sup> J. Ciechanowicz, *Prawo ochrony środowiska*, Koszalin 1995, pp. 101–102; eadem, *Międzynarodowe prawo ochrony środowiska*, Warszawa 1999, p. 29 and next.

<sup>9</sup> Eadem, *Prawo ochrony i zarządzania środowiskiem*, 2. edition, Warszawa 2019, p. 44.

1988, the Intergovernmental Panel on Climate Change (IPCC) was established. The deliberations of the aforementioned Conference culminated in the enactment of the Climate Convention in 1992<sup>10</sup>, the purpose of which was to achieve stabilisation of greenhouse gas concentrations in the atmosphere at a safe level that would prevent harmful human interference with the climate system. Two key areas of focus were identified, i.e. the reduction of greenhouse gas concentrations in the atmosphere and adaptation to climate change<sup>11</sup>. The problem of climate change has also been recognised within the European Union, which is reflected in Article 191(1) of the TFEU as one of the objectives of the Union's environmental policy. Apart from preserving, protecting and improving the quality of the environment, the protection of human health and the prudent and rational utilisation of natural resources, these objectives place emphasis on promoting measures available at the international level to deal with regional or worldwide environmental problems, in particular combating climate change. The problem of climate change and water scarcity in the EU has been addressed in a number of recovery programmes, European Commission reports and directives, notably the Water Framework Directive, as well as in Polish legislation, particularly the 2017 Water Law.

The aim of this paper is to identify the legal status and administrative instruments aimed at counteracting climate change and water deficits across the EU and in Poland itself. This study analyses the existing legal regulations and programmes in regard to the effective protection of climate and water resources. The paper uses a legal-dogmatic method by analysing legal regulations, programmes and EU documents concerning actions mitigating climate change and the availability and protection of drinking water resources, as well as relevant literature in this area.

## **Recovery programmes to combat climate change and water deficits in the EU**

The provisions contained in the TFEU regarding environmental protection, including actions against climate change, have been implemented in a number of EU recovery programmes. One such programme is the European Green

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<sup>10</sup> United Nations Framework Convention on Climate Change, UNFCCC, signed 9 May 1992 in New York (Law Journal of 1996, No. 53, item 238), hereinafter as Convention on Climate Change. See also R. Szczerbowski, B. Cerań, *Polityka energetyczna Polski w aspekcie wyzwań XXI wieku*, „Polityka Energetyczna – Energy Policy Journal” 2017, Vol. 20, No. 3, p. 25; J. Ciechanowicz-McLean, *Prawne problemy umów międzynarodowych z zakresu ochrony klimatu*, „Gdańskie Studia Prawnicze” 2016, Vol. XXXVI, p. 27.

<sup>11</sup> J. Ciechanowicz-McLean, *Globalne prawo środowiska. Podstawowe zagadnienia*, Gdańsk 2021, pp. 95–96; A. Borek, E. Wróblewski (eds.), *Prawne aspekty adaptacji do zmian klimatu z perspektywy UNFCCC i prawa krajowego*, Warszawa 2021, p. 18 and next.

Deal adopted in 2019<sup>12</sup> (EGD), which sets out to make the Community's economy climate-neutral and resource-efficient by 2050. Under this programme, changes have been introduced in six areas, including the elimination of pollution of air, water, soil, etc. The EGD assumptions are also implemented within the framework of the circular economy<sup>13</sup>. The concept seeks to rationalise the consumption of resources and reduce the environmental impact of manufactured products, which – like materials and raw materials – should remain in the economy for as long as possible, while generating waste and water consumption should be kept to a minimum<sup>14</sup>.

The “Pathway to a Healthy Planet for All EU Action Plan: Towards Zero Pollution for Air, Water and Soil” (COM(2021) 400 final)<sup>15</sup> is a document from the European Commission that outlines a new strategy to combat pollution. The plan is based on the precautionary principle and the principles of preventive action, with the goal of eliminating pollution by first addressing it at its source using the “polluter pays” approach. The plan prioritizes anti-pollution measures, such as eliminating existing contamination of water and soil and working to restore them to a “good condition”.

The issue of water deficits more generally was raised by the European Environment Agency (EEA) in its report No. 2/2009 *Water resources across Europe – confronting water scarcity and drought*. In this document, the EEA highlighted key conclusions and recommendations to counter this phenomenon. The focus in water resources management should therefore shift from increasing water supply to reducing demand, which requires different policies and practices. In this context, water charges should be based on the quantity consumed in all sectors, including agriculture. Governments should implement drought risk management plans to a greater extent and concentrate more on the actual risk rather than on crisis management. Water-intensive bioenergy crops should be avoided in areas where water is scarce. Efforts to increase public awareness, environmental certification, and educational programmes

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<sup>12</sup> European Commission, Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions, The European Green Deal, COM(2019) 640 final, Brussels, 11.12.2019.

<sup>13</sup> European Commission, Closing the Loop – An EU Action Plan for the Circular Economy Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, COM (2015)614/2, Brussels, Belgium, 2015.

<sup>14</sup> See more: M. Geissdoerfer, P. Savaget, N.M.P. Bocken, E.J. Hultink, *The circular economy – A new sustainability paradigm?*, „Journal of Clean Production” 2017, Vol. 143, pp. 757–768; E.M. Zębek, J.J. Zięty, *Effect of landfill arson to a “lax” system in a circular economy under the current EU energy policy: perspective review in waste management law*, „Energies” 2022, Vol. 15, 8690, <https://doi.org/10.3390/en15228690>.

<sup>15</sup> European Commission, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Pathway to a Healthy Planet for All EU Action Plan: Towards Zero Pollution for Air, Water and Soil, COM(2021) 400 final, Brussels, 12.5.2021.

in schools are all essential if water use is to be sustainable. In addition, the problem of leaking water distribution networks needs to be addressed, as in some European countries water losses from leaks exceed 40% of the total water supply. Adequate monitoring and a system of fines and penalties are also required to tackle the problem of illegal water abstraction, often for agricultural purposes in certain parts of Europe. To reduce water shortages, authorities should further develop incentives to encourage greater use of alternative water sources, i.e. treated wastewater, so-called “grey water”, or stored rainwater<sup>16</sup>.

### Legal actions against water deficits in the EU

As regards recovery action on water scarcity, it is also worth mentioning the Follow up to the European citizens’ initiative Right2Water, contained in Resolution 2017/C 316/09<sup>17</sup>. The central message of the campaign was that EU legislation should oblige national governments to ensure that all residents have access to adequate quantities of clean drinking water and sanitation. The programme was the first European citizens’ initiative leading to the collection of more than one million signatures. The Commission launched a Union-wide public consultation and carried out a Regulatory Fitness and Performance (REFIT) Evaluation of Directive 98/83/EC<sup>18</sup>. This directive established a legal framework for the protection of human health against the adverse effects of any contamination of water intended for human consumption by ensuring that it is healthy and clean. The European Commission intended to act in various areas related to this initiative (increasing transparency, stimulating innovation, etc.) and presented a legislative proposal for the revision of the Drinking Water Directive providing, *inter alia*, for an obligation imposed on Member States to ensure access to water for the most vulnerable people. The European Commission proposed a revision of the legislation with a view to improving the status of and access to drinking water. The new rules are designed to ensure high-quality tap water across the EU.

This initiative led to the enactment of Directive (EU) 2020/2184 of the European Parliament and of the Council of 16 December 2020 on the quality of water intended for human consumption<sup>19</sup>. This Directive is expected to have

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<sup>16</sup> EEA, Report No. 2/2009 Water resources across Europe – confronting water scarcity and drought EEA, Copenhagen, 2009 <https://www.eea.europa.eu/publications/water-resources-across-europe>.

<sup>17</sup> European Parliament resolution of 8 September 2015 on the follow-up to the European Citizens’ Initiative Right2Water (2014/2239(INI)) (OJ C 316/99 P8\_TA(2015)0294, 22.9.2017).

<sup>18</sup> Council Directive 98/83/EC of 3 November 1998 on the quality of water intended for human consumption (OJ L 330, 5.12.1998, p. 32–54).

<sup>19</sup> OJ L 435/123, 23.12.2020, p. 1–62.

the same objective as Directive 98/83/EC and should improve access to this type of water for everyone in the EU. According to this assumption, this Directive aims to protect human health from the adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean and improving access to water intended for human consumption (Article 1). It is worth noting that, within the meaning of the Directive, water intended for human consumption means: (a) all water, either in its original state or after treatment, intended for drinking, cooking, food preparation or other domestic purposes in both public and private premises, regardless of its origin and whether it is supplied from a distribution network, supplied from a tanker or put into bottles or containers, including spring waters, and (b) all water used in any food business for the manufacture, processing, preservation or marketing of products or substances intended for human consumption (Article 2(1)). It is therefore necessary to lay down the minimum requirements to be met by water intended for that purpose at the Union level. Member States should take the measures necessary to ensure that water intended for human consumption is free from any microorganisms and parasites and from any substances which, in numbers or concentrations, constitute a potential danger to human health and that it complies with those minimum requirements (Article 4). This Directive addresses the need to identify risks that could affect drinking water supplies and to monitor harmful substances that have been assessed as relevant, i.e. nitrates, pesticides or pharmaceuticals, and arsenic. In the case of water intended for human consumption coming from surface water, Member States should pay particular attention to the microplastic content when carrying out their risk analysis. In Article 16, the Directive also highlights the issue of access to water for human consumption. The member states of the EU are responsible for implementing measures to improve and maintain access to clean water for all residents, with a particular focus on vulnerable and marginalized groups. These measures should be taken in accordance with the principles of subsidiarity and proportionality, and should take into account local, regional, cultural, and geographical considerations as well as the availability of water.

When considering EU regulations on water protection and deficit prevention, it is important to mention the Water Framework Directive (WFD) No. 2000/60/EC<sup>20</sup>. This directive governs the management of inland surface waters, transitional waters, coastal waters and groundwaters, resources which are used for domestic, industrial and agricultural purposes. The directive is designed to establish a framework for the above water types which: (a) prevents further deterioration and protects and enhances the status of aquatic ecosys-

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<sup>20</sup> Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (OJ L 327, 22.12.2000, p. 1–73).

tems and, with regard to their water needs, terrestrial ecosystems and wetlands directly depending on the aquatic ecosystems; (b) promotes sustainable water use based on the long-term protection of available water resources; (c) aims at enhanced protection and improvement of the aquatic environment, *inter alia*, through specific measures for the progressive reduction of discharges, emissions and losses of priority substances and the cessation or phasing-out of discharges, emissions and losses of the priority hazardous substances; (d) ensures the progressive reduction of pollution of groundwater and prevents its further pollution, and (e) contributes to mitigating the effects of floods and droughts (Article 1). Regarding water intended for human consumption, the Member States are obliged to designate, in each river basin district, all bodies of water used for the abstraction of water intended for human consumption, providing an average of more than 10 m<sup>3</sup> per day or serving more than 50 persons, and those which are intended for such purposes in the future. In addition, they must provide an adequate treatment regime for such waters as required by Directive 98/83/EC.

Member States have also been obliged to ensure the necessary protection for the bodies of water identified with the aim of avoiding deterioration in their quality in order to reduce the level of purification treatment required in the production of drinking water. Member States may establish safeguard zones for those bodies of water (Article 7). However, reports from the European Commission indicate that some provisions of the WFD are too stringent and difficult for Member States to implement, with particular challenges regarding monitoring. The main problems include: a) insufficient environmental and economic assessment tools; b) gaps in individual river basin districts or individual water categories, including those used for human consumption, especially in the countries that joined the EU in 2004 and 2007; c) insufficient budgets in the Member States to achieve the WFD objectives by 2015, especially for certain important 'baseline measures', e.g. wastewater treatment or tackling the problem of nitrate emissions from agriculture; d) monitoring programmes that focused on investigating individual structural parameters, under the assumption that good quality of such elements corresponds to the good functioning of ecosystems and, hence, these programmes focus on the symptoms rather than the causes of water degradation<sup>21</sup>.

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<sup>21</sup> M. Maciejewski, T. Walczykiewicz, *Dotychczasowe doświadczenia związane z wdrażaniem Ramowej Dyrektywy Wodnej*, „Infrastruktura i Ekologia Terenów Wiejskich” 2006, No. 4(1), pp. 63–76; T. Błaszczak, *Ramowa Dyrektywa Wodna: strategia wdrażania*, [in:] B. Glaeser, A. Sekścińska, N. Löser (eds.), *Integrated coastal zone management at the Szczecin Lagoon: exchange of experiences in the region*, „Coastline Reports” 2005, Vol. 6, pp. 87–99; P. Pawlaczyk, *Perspektywy osiągnięcia celów Ramowej Dyrektywy Wodnej w Polsce*, „Przegląd Przyrodniczy” 2012, Vol. XXIII, No. 3, pp. 52–68; E. Zębek, *Legal solutions of lake monitoring systems in Poland in compliance with the Water Framework Directive*, „Review of European and Comparative Law” 2022, Vol. 48, No. 2, pp. 163–192.



## **Political instruments to combat climate change and water deficits in Poland**

Being a party to the Climate Convention and an EU Member State, Poland has been obliged to implement its provisions in the aforementioned EU recovery programmes and to incorporate EU provisions into its legislation in order to combat climate change and water deficits. In this regard, Poland signed the Kyoto Protocol in 1998, which entered into force in 2005, under which it undertook to reduce greenhouse gas emissions by 6% between 2008 and 2012, achieving a greater reduction of up to 32%. It is believed that economic transformation has contributed to this overall decrease<sup>22</sup>. This has also been reflected in the Energy Policy 2040 (PEP40)<sup>23</sup>, which maps out the framework for the energy transition in the form of three pillars: 1) just transformation, 2) zero-emission energy system, and 3) good air quality. PEP2040 is consistent with the National Energy and Climate Plan 2021–2030 (NECP)<sup>24</sup>. This document outlines the assumptions and objectives as well as policies and actions for the realisation of the five dimensions of the energy union, i.e. energy security, internal energy market, energy efficiency, decarbonisation and research, innovation and competitiveness.

Efforts to combat climate change and water scarcity are also included in the *National Environmental Policy 2030 – Environment and Water Development Strategy* (PEP2030)<sup>25</sup>. The specific objectives of PEP2030 relate to health, economy and climate and are pursued through directions of intervention, including counteracting climate change, adapting to climate change and managing the risk of natural disasters, and sustainable water management, including ensuring access to clean water for the public and the economy and achieving good quality of water. As regards climate change, the PEP2030 should foster the implementation of Poland's objectives and commitments in the context of the EU climate and energy policy targets until 2030 based mainly on the Paris Agreement<sup>26</sup>, i.e. first and foremost, the reduction of greenhouse gas emissions by at least 40% compared to 1990 levels. In addition, it should strive to achieve a balance between human-induced greenhouse gas

<sup>22</sup> J. Ciecchanowicz-McLean, *Globalne prawo...*, p. 101; M. Stoczkiewicz, *Prawo ochrony klimatu w kontekście praw człowieka*, Warszawa 2021, pp. 81–82.

<sup>23</sup> Announcement of the Minister of Climate and Environment of March 2, 2021 on the state energy policy until 2040 (M.P. of 2021, item 264).

<sup>24</sup> Ministerstwo Aktywów Państwowych, Krajowy plan na rzecz energii i klimatu na lata 2021–2030. Założenia i cele oraz polityki i działania, wersja 4.1 z dnia 18.12.2019, <https://dane.gov.pl/pl/dataset/2063,krajowy-plan-na-rzecz-energii-i-klimatu-na-lata-20> (accessed: 25.11.2022).

<sup>25</sup> Resolution No. 67 of the Council of Ministers of July 16, 2019 on the adoption of the “National Environmental Policy 2030 – development strategy in the field of environment and water management” (M.P. of 2019, item 794).

<sup>26</sup> Paris Agreement to the United Nations Framework Convention on Climate Change, signed in New York on 9 May 1992, adopted in Paris on 12 December 2015 (Law Journal of 2017, item 36).

emissions and their absorption by biosystems as natural carbon sinks, which not only provides an opportunity to permanently and effectively halt growth and ultimately reduce CO<sub>2</sub> concentrations in the atmosphere but can also foster synergies in the implementation of multiple sustainable development goals. For this reason, actions will be taken to effectively reduce atmospheric concentrations of greenhouse gases, especially in sectors such as energy, transport, and agriculture, through the introduction of innovative technologies, the use of available energy sources, including the development of geothermal energy, as well as the introduction of the concept of Forest Carbon Farms, which is the Polish proposal for reducing the atmospheric concentrations of greenhouse gases.

At the same time, a number of adaptation efforts aimed at reducing the vulnerability of the economy to the effects of climate change will be undertaken. This is where the circular economy applies, which is based on the implementation of full recycling of waste at the local level, including plastics. The circular economy is also of great importance in water and wastewater management (in the context of sewage sludge management and the use of treated wastewater as process water or for urban greening) and energy, as well as in the management of rainwater and snowmelt (water recycling, reduction of the “water footprint”). One possible way of mitigating the effects of climate change is through policies that focus on managing and protecting water, soil and biological resources in order to maintain and restore healthy and functioning ecosystems capable of adapting to climate change. These strategies can also contribute to the prevention of environmental disasters. This is where green infrastructure enters the picture, as it can contribute to improving the soil’s carbon and water storage capacity and water retention in natural systems, thereby mitigating the effects of drought and preventing flooding, soil erosion and desertification<sup>27</sup>.

In line with the PEP2030 assumptions, an extremely important element from the point of view of sustainable development is the implementation of a modern water resources and flood risk management system. Therefore, the National Water Holding Polish Waters, by means of catchment management, will perform tasks in the following areas: maintaining the improvement of water quality and preventing its deterioration, preventing the effects of drought and supporting municipalities in providing water for the needs of the commu-

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<sup>27</sup> Green Infrastructure: A strategically planned network of natural and semi-natural areas with other environmental features, designed and managed to provide a wide range of ecosystem services. It includes green areas (or blue in the case of aquatic ecosystems) and others physical characteristics of terrestrial (including coastal) and marine areas. There is green infrastructure on land present in rural areas and in urban environments (Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions Green Infrastructure (GI) – Enhancing Europe’s Natural Capital (SWD(2013)155 final), 52013DC0249).

nity and the economy. This is important due to low water resources with high variability and spatial diversity. In fact,  $\frac{3}{4}$  of the country's area is periodically subject to water deficits (Wielkopolska, Mazovia and Kujawy are most frequently and most severely affected). In this context, the problem lies in insufficient retention of local catchments caused, *inter alia*, by the growing number of sealed surfaces created as a result of urbanisation and the development of transport infrastructure as well as changes in agricultural production, and also by the excessive acceleration of water outflow from catchments and river basins from melioration facilities that perform mainly drainage functions. Excessive exploitation of groundwater reservoirs, often a source of drinking water, has also been recorded. Access to sewerage and water supply systems for the population is gradually being improved. Therefore, the implementation of the Sustainable Water Management programme, including ensuring access to clean water for society and the economy and achieving good water status, constitutes a crucial element of PEP2030. Intervention in this area will consist primarily in the implementation of a unified water management structure of the catchment system, responsible for all water-related activities, including, above all, protection against flooding and drought, together with the supply of water of adequate quality and disposal of wastewater. Another necessity was to ensure a viable and effective water authority as defined in Article 3 of the FWD and to provide for its adequate influence on water management matters, including, in particular, planning in water management, protection of water resources and the introduction of a system of consents required under Water Law Act.

## **Administrative instruments to water deficits in Poland**

Under the Polish legal system, these provisions were implemented in the Act of 20 July 2017 – Water Law (WL)<sup>28</sup>. The focus of the Act's regulations is the management of water in compliance with the principle of sustainable development, in particular, the shaping and protection of water resources, the use of water and the management of water resources (Article 1). The goal of water protection is to achieve environmental objectives for surface water bodies, groundwater bodies and protected areas, as well as to improve water quality and biological relations in the aquatic environment and wetlands. Appropriate water resources management is necessary in order to meet these objectives. As outlined in Article 10 of the Water Law (WL), the management of water resources should prioritize the needs of both the population and the economy while also protecting water and the environment related to these

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<sup>28</sup> Consolidated text Law Journal of 2021, item 2233 as amended.

resources. This includes ensuring an adequate quantity and quality of water for all, protecting against floods and droughts, preventing pollution and improper or excessive exploitation of water resources, and working to maintain or improve the overall status of water and water-dependent ecosystems. Important water resource management instruments that are helpful in preventing water deficits mentioned in Article 11 of the Water Law Act include proper water management planning, the water consent system and water management control. Indeed, water management planning serves the purpose of programming and coordinating actions to (a) achieve or maintain the good status of waters and aquatic ecosystems and protect, enhance and prevent further deterioration of aquatic, terrestrial and wetland ecosystems; (b) improve the status of water resources; (c) promote sustainable water use based on the long-term protection of available water resources; (d) reduce discharges of substances and emissions into water or land that may have a negative impact on water; and (e) improve flood protection and combat the effects of drought (Article 316 of WL). Within the framework of the tasks imposed on Polish Waters concerning counteracting the effects of drought, there are separate plans being drawn up which include an analysis of the potential for increasing available water resources, proposals for the construction or reconstruction of water facilities and changes in the use of water resources as well as natural and artificial retention; plus measures to counteract the effects of drought (Article 184 of WL)<sup>29</sup>.

The system of consents required under the Water Law Act includes mainly a water permit, acceptance of the water permit request and a water assessment (Article 388 of WL). According to Article 33 of the Water Law, a water permit is required for the abstraction of groundwater or surface water for municipal purposes when the average annual volume exceeds five cubic meters per day. This is considered specific use of water as outlined in Article 34 of the WL and goes beyond what would be considered ordinary use. This type of use should also include activities that contribute to the increase or decrease of available water resources, i.e. a) drainage of land and crops; b) carrying out construction works or erecting buildings permanently connected to the ground on a property with an area exceeding 3,500 m<sup>2</sup>, resulting in a decrease in the natural terrain retention by excluding more than 70% of the property from the biologically active surface in areas not connected to either an open or a closed sewage system; c) water transfers and artificial groundwater recharge; d) using water to irrigate soil or crops, as well as for the purposes of agricultural activity, in volumes exceeding an annual average of 5 m<sup>3</sup> per day; e) using water for the purposes of economic activity. In addition, a water per-

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<sup>29</sup> See more: M. Pchałek (ed.), *Gospodarowanie wodami. Kluczowe wyzwania w ramach nowego cyklu planistycznego*, 2020, Lex.

mit is required for water services or long-term lowering of the groundwater table<sup>30</sup>. At this point, it should be stressed that the supply of water used for various purposes is achieved through water services. Pursuant to Article 35 of WL, water services thus consist in providing households, public entities and businesses with the possibility to use water beyond the scope of common water use, ordinary water use and specific water use. Water services include a number of water uses which have hitherto been regarded as specific water uses generally not subject to charges (with the exception of discharging wastewater into bodies of water or into the ground). A number of them have now been qualified by the legislator as water services, increasing the scope of financial burdens addressed to entrepreneurs who use water within the limits of water services beyond the scope of general water use, ordinary water use and special water use<sup>31</sup>. Thus, water services concerning water supply include: the abstraction of groundwater or surface water; damming, storage or retention of groundwater and surface water and the use of such water; groundwater and surface water treatment and distribution. A water supply assessment analyses the impact of a planned investment or activity on the achievement of environmental objectives for water and protected areas. Its purpose is to assess whether environmental objectives are being met, in the same way as in a water management plan, although by means of an individual administrative procedure. The obligation to obtain an assessment precedes the application for a water permit<sup>32</sup>.

Protection zones are created in order to strengthen the protection of waters abstracted for various purposes. Indeed, in accordance with Article 120 of the Water Law Act, the establishment of protection zones of water intakes serves the purpose of ensuring appropriate quality of water abstracted to supply the population with water intended for human consumption and to supply establishments requiring high-quality water. The protection zone covers an area with prohibitions, bans and restrictions on the use of land and water. The protection zone includes: (1) a direct protection area only or (2) a direct protection area and an indirect protection area. A protection zone comprising only a direct protection area is established for each water intake, excluding water intakes for ordinary water use (Article 121). As stipulated in Articles 127 and 128 of the Water Law, the direct protection area of a water intake should be fenced and landscaped and may only be used for purposes related to the exploitation of that water intake. Only persons employed to operate the water

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<sup>30</sup> See more: E. Zębek, *Water-law permission as an administrative and legal instrument for the management and protection of water resources*, „Acta Scientiarum Polonorum Administratio Locorum” 2020, Vol. 19(2), pp. 119–130.

<sup>31</sup> P. Szuwalski, *Prawo wodne. Komentarz do wybranych przepisów*, 2019, Lex.

<sup>32</sup> P. Ćwiek, *Ocena wodnoprawna – nowe obowiązki inwestora*, 2017, Lex; E. Zębek, *Ocena wodnoprawna jako nowy instrument administracyjnoprawny ochrony wód powierzchniowych*, „Gubernaculum et Administratio” 2021, No. 1(23), pp. 191–210.

intake may be present in this area, and the presence of other persons should be kept to a minimum. Installations for the extraction of water situated in this area must be protected against the ingress of rainwater and snowmelt, and sewage from sanitary facilities located in this area intended for the use of persons employed in the operation of the water intake must be discharged outside this area<sup>33</sup>. However, it may be prohibited or restricted to carry out works or activities which reduce the usability of the water intake or the efficiency of the water intake in the area of intermediate protection, i.e. any activity causing a deterioration in the quality of the water (Article 130)<sup>34</sup>. Standards for the quality of water abstracted for human consumption are set out in the Ordinance of the Minister of Health of 7 December 2017 on the quality of water intended for human consumption<sup>35</sup>. The cited regulation contains: 1) the requirements for the quality of water intended for human consumption, including the bacteriological, physicochemical and organoleptic requirements; 2) the method of assessing the suitability of water; 3) the minimum frequency and sites of water sampling for testing; 4) the scope of water quality testing; 5) the water quality monitoring programme; 6) the manner of supervision of materials and products used in water treatment and distribution processes; 7) the manner of supervision over laboratories performing water quality tests; 8) the manner of informing consumers about water quality; 9) the course of action before the authorities of the State Sanitary Inspection if water does not meet the quality requirements (§ 1).

The final water management instrument under review is water management monitoring, which covers issues relating to both quantitative and qualitative water parameters. These include checks on, *inter alia*, the use of water and the protection of water resources; the maintenance of water bodies and water facilities; compliance with the requirements of the protection zones

<sup>33</sup> D. Pikor, *Strefy ochronne ujęć wody*, 2019, Lex.

<sup>34</sup> This applies to the following prohibitions: (1) introducing sewage into waters or into the ground; (2) agricultural use of sewage; (3) storage or disposal of radioactive waste; (4) use of fertilizers and plant protection products; (5) construction of new roads, railway lines, airports or airstrips; (6) construction of water melioration devices and earth excavations; (7) locating industrial plants and animal breeding farms; (8) locating warehouses for petroleum products and other substances, as well as pipelines for their transport; (9) locating landfills of hazardous waste, other than hazardous and inert and inert waste; (10) washing motor vehicles; (11) arranging car parks, campsites, bathing areas and places occasionally used for bathing; (12) locating new water intakes; (13) locating cemeteries and burying dead animals; (14) mining of minerals; (15) construction or mining drainage; (16) locating residential buildings and constructions related to tourism; (17) using aircraft to carry out agricultural operations; (18) arranging silage heaps; (19) breeding or breeding of fish, their feeding or baiting; (20) watering and grazing animals; (21) extraction of stone, gravel, sand and other materials, as well as cutting plants from waters or the shore; (22) practicing water sports; (23) operation of diesel-powered vessels; (24) locating new projects that may have a significant impact on environment; (25) storage of packaging of fertilizers and plant protection products; (26) use and storage of chemical means of winter road maintenance.

<sup>35</sup> Journal of Law of 2017, item 2294.

and protected areas; and the quality of water abstracted for the supply of water for human consumption (Article 334 of WL). Such water management inspections are carried out by Polish Waters (Article 335 of WL)<sup>36</sup>.

## Conclusions

Both the safety of human life and health depends on ensuring water in sufficient quantity and quality. The increasing water deficits in the EU caused by climate change, among other things, have prompted the establishment of recovery programmes and appropriate, effective legal instruments. This is of utmost importance for Europe, especially for the Mediterranean region, but also for Poland, where recorded water resources are below the water security level. When analysing the legal status in this respect, it would be appropriate to divide it into two intertwining areas of action, resulting in the establishment of effective preventive and remedial legal instruments. The first relates to legislative action to prevent and combat climate change, and the second to the effective protection of water resources and the prevention of water scarcity. As far as climate action is concerned, the adoption of the Climate Convention in 1992 was paramount, as it delineated the two most important areas of action in this regard, i.e. reduction of greenhouse gas concentrations in the atmosphere and adaptation to climate change and triggered intensified efforts, justified by the current state of the environment, to mitigate the on-going consequences of climate change. Given these concerns, it is advisable to develop EU legislation that incorporates these issues into the Treaties of the EU (TFU) and related policies. For example, incorporating them into the EU's environmental or energy policy and developing and implementing recovery plans such as the European Green Deal and the "circular economy" strategy. This will help to create a climate-neutral and resource-efficient economy.

The EU and Poland are facing a growing water deficit. To address this, legislative actions have been taken in three areas:

- 1) Protection of water resources for municipal and economic use, ensuring adequate quantity and quality, particularly for drinking water.
- 2) Reviewing water resources, balancing supply and demand, and the condition of water supply networks to limit water abstraction, prevent loss, and address shortages.
- 3) Preventing droughts by using legal and organizational tools, especially in vulnerable areas.

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<sup>36</sup> See M. Kasperek-Kawalek, *Kontrola gospodarowania wodami*, „Gospodarka Wodna” 2012, Vol. 6, No. 68357. <https://www.sigma-not.pl/publikacja-68357-kontrola-gospodarowania-wodami-gospodarka-wodna-2012-6.html>.

EU legislation in these areas is based on the assumptions of UN Resolutions, starting with No. 64/292 of 2010 and up to No. 2187 of 2021, and the guidelines of the European Environment Agency (EEA) calling for proper management of water resources under conditions of sustainable development, the introduction of appropriate legal instruments to prevent water losses and deficits, in order to ensure sufficient drinking water supplies. One key development in this area has been the Right2Water Initiative, which has prompted the revision of legislation on the quality of drinking water in the form of the enactment of the new Directive 2020/2184. It needs to be noted here that this is an important step in shaping and strengthening the legal protection of those water resources considered strategic, aiming to improve access to such water for all in the EU and setting new legal standards on the quality of drinking water. It is noteworthy that the protection of water resources in a broad sense is also regulated by the Water Framework Directive, the main aim of which is to pursue the objective of less pollution and more water available for domestic and economic purposes and to achieve environmental objectives, i.e. good water quality.

The EU regulations and programmes reviewed here have been implemented into Polish legislation, which is evident not only in Poland's environmental policies and programmes (PEP2040, PEP2030, KPEiK) but also in legislation, mainly the Water Law Act of 2017. Essential water resources management instruments useful for preventing water deficits include proper planning in water management, a system of permits required under the Water Law that would perform a rationing and protection function towards water resources, and control over the management of waters, especially those used for human consumption. Unfortunately, regardless of the introduction of these programmes and regulations into Polish legislation, challenges remain in terms of achieving environmental objectives, with the problem of water scarcity set to continue and grow unless comprehensive resource-efficient management is introduced. Indeed, legal instruments for water management and protection are insufficient on their own, and changes need to be made to the management of raw materials, production technologies and the environmental awareness of the public.

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## Summary

### Water deficits in the European Union as a consequence of climate change – legal and ecological aspects

**Keywords:** environmental law, climate protection, water deficits, EU policies and programmes, legal protection of water, administrative law instruments.

According to reports by the Environment Agency (EEA), water deficits caused by climate change is a priority issue in Europe, including Poland, and requires comprehensive legal and organizational solutions. This paper aims to examine the legal status and administrative-legal instruments that address climate change and water deficits in both the EU and Poland. These include measures outlined in the EU’s environmental and energy policy, the European Green Deal, the Circular Economy, the Right2Water initiative, the EU Treaties, the Water Framework Directive, and the Directive on the quality of water intended for human consumption, as well as Poland’s environmental policies and Water Law Act of 2017. The main goals of the analyzed documents and legislation are to reduce greenhouse gas emissions, promote a resource-efficient economy and adapt to climate change. In terms of addressing water scarcity, legislative actions focus on protecting available water resources for municipal purposes, reviewing the level of water resources and balancing supply and demand, and preventing droughts. Essential tools for managing water resources include proper planning, permit systems, and oversight. Despite these efforts, significant challenges remain in achieving environmental objectives and addressing water scarcity. Legal instruments alone are insufficient, and a more comprehensive, resource-efficient management approach is needed, including changes to resource management, production technologies, and public awareness.

## Streszczenie

### Deficyty wody w Unii Europejskiej jako skutek zmian klimatu – aspekt prawny i ekologiczny

**Słowa kluczowe:** prawo ochrony środowiska, ochrona klimatu, deficyty wody, polityki i programy UE, prawna ochrona wód, instrumenty administracyjnoprawne.

Według raportów Agencji Środowiska (EEA) problem deficytów wody spowodowany zmianami klimatu osiągnął w Europie, w tym także i w Polsce, wysoką rangę i wymaga kompleksowych rozwiązań prawnych i organizacyjnych. Celem artykułu jest wskazanie stanu prawnego i instrumentów administracyjnoprawnych przeciwdziałających zmianom klimatu i deficytów wody w UE i w Polsce. Działania w tym zakresie zostały uwzględnione w polityce ekologicznej i energetycznej UE, programach Europejski Zielony Ład, Gospodarka o obiegu zamkniętym, inicjatywie „Right2Water”, TFU, RDW nr 2000/60/WE oraz w dyrektywie nr 2020/2184 w sprawie jakości wody przeznaczonej do spożycia, a w Polsce w politykach ekologicznych oraz w ustawie Prawo wodne z 2017 r. Głównymi celami analizowanych dokumentów i przepisów prawnych dotyczących zapobiegania i zwalczania zmian klimatu jest ograniczenie emisji gazów szklarniowych, wprowadzenie gospodarki zasobooszczędnej oraz adaptacja do zmian klimatu. Natomiast w odniesieniu do działań legislacyjnych dotyczących zapobiegania deficytom wody można wyróżnić trzy kierunki współzależne od siebie, a mianowicie: ochronę dostępnych zasobów wodnych do celów komunalnych, czyli dążenie do uzyskania bezpieczeństwa wodnego, rewizję stanu zasobów wodnych, bilansu podaży i popytu wody, a także stanu technicznego sieci wodociągowych, mające na celu ograniczenie poboru wody oraz zapobieganie suszom poprzez ustanowienie instrumentów prawnych i organizacyjnych. Istotnymi instrumentami zarządzania zasobami wodnymi są odpowiednie planowanie w gospodarowaniu wodami, system zgód wodnoprawnych pełniących funkcję reglamentacyjno-ochronną zasobów wodnych oraz kontrola gospodarowania wodami. Niestety, pomimo wdrażania tych programów i przepisów do prawodawstwa polskiego, są trudności z uzyskaniem celów środowiskowych i problem deficytów wody będzie istniał, a bez wprowadzenia kompleksowej gospodarki zasobooszczędnej wręcz narastał. Niewystarczające są bowiem tylko instrumenty prawne w zakresie zarządzania i ochrony wody, ale zmiany muszą nastąpić w gospodarce surowcowej, technologiach produkcji i świadomości ekologicznej społeczeństwa.

