

# CLIMATE ACTION THROUGH ARTIFICIAL INTELLIGENCE: INTERNATIONAL LEGAL PERSPECTIVE

## KLIMATICKÉ OPATRENIA PROSTEDNÍCTVOM UMELEJ INTELIGENCIE: MEDZINÁRODNOPRÁVNÝ POHĽAD

*Lucia Bakošová*<sup>1</sup>

<https://doi.org/10.33542/SIC2022-2-01>

### ABSTRACT

*Far-reaching negative effects of climate change are putting pressure on the international community to adopt appropriate climate actions with regard to sustainable development. The use of artificial intelligence may be one of the tools to achieve the goals set in the United Nations Sustainable Development Goals. The paper highlights several examples of artificial intelligence that can be used to achieve appropriate climate action, such as weather and natural disaster predictions, or they can help monitor, model and manage environmental systems, whether it is illegal logging, water degradation, illegal fishing and poaching, air pollution or the burden of farming. Technologies using artificial intelligence are, however, often developed and used in an ethical and legal vacuum. The aim of the paper is to outline the existing international legislation in the context of meeting the goals of sustainable development in the field of climate action through artificial intelligence and to point out potential legal challenges of its use.<sup>2</sup>*

### ABSTRAKT

*Ďalekosiahle negatívne účinky zmeny klímy vyvíjajú tlak na medzinárodné spoločenstvo, aby prijalo vhodné opatrenia v oblasti klímy a to s ohľadom na udržateľný rozvoj. Využitie umelej inteligencie môže byť jedným z nástrojov na dosiahnutie cieľov stanovených v Cieloch Organizácie Spojených národov pre trvalo udržateľný rozvoj. Príspevok poukazuje na niekoľko príkladov umelej inteligencie, ktoré možno použiť na dosiahnutie vhodných klimatických opatrení, ako napríklad predpoveď počasia a prírodných katastrof, alebo môžu pomôcť pri monitorovaní, modelovaní a riadení environmentálnych systémov, či už ide o ilegálnu ťažbu dreva, znehodnocovanie vody, neoprávnený rybolov a pytliactvo, znečisťovanie vzduchu alebo záťaž z poľnohospodárskej činnosti. Technológie využívajúce umelú inteligenciu sú však častokrát vyvíjané a používané v etickom a právnom vákuu. Cieľom príspevku je analýza existujúcej medzinárodnoprávnej úpravy v kontexte napĺňania cieľov udržateľného rozvoja v oblasti klimatických opatrení prostredníctvom umelej inteligencie a poukázať na možné právne problémy jej využívania.*

### I. INTRODUCTION

“The challenge of pollution and global warming is no longer the science, or the rate of innovation, but the rate of implementation: We have the clean solutions; now let's bundle them and install them.”<sup>3</sup>

<sup>1</sup> Mgr., PhD., Univerzita Pavla Jozefa Šafárika v Košiciach, Právnická fakulta, Slovenská republika  
Pavol Jozef Šafárik University in Košice, Faculty of Law, Slovak Republic.

<sup>2</sup> The article presents a partial output within the research project APVV-20-0576 entitled "Green Challenges for Sustainable Development (European Green Deal in the Context of International and National Law)".

<sup>3</sup> SKIBSTED, J. M.: *How can we build the green cities of tomorrow?*, World Economic Forum, 26 October 2015. Online: <https://www.weforum.org/agenda/2015/10/how-can-we-build-the-green-cities-of-tomorrow/> (cited 31 May 2022).

Climate action in recent years is gaining momentum, especially in connection to the negative effects of climate change, such as the sea-level rise, the high occurrence of natural disasters, loss of biodiversity, forced migration, land degradation or freshwater scarcity add to and exacerbate the list of challenges that the international community faces. In order to reverse the mentioned negative phenomena, States, international organizations, multinational corporations and individuals, must adopt appropriate climate measures. Frequently, the newly adopted climate actions are connected with the concept of sustainable development. Although, the concept of sustainable development is not a new one, its application today is more urgent than ever. From the legal perspective, it is pervasive in all sorts of documents, such as international treaties, resolutions of international organizations or judicial decisions of international judicial and quasi-judicial organs.<sup>4</sup> The focus in this paper is given to the United Nations Sustainable Development Goals, also known as the 2030 Agenda for Sustainable Development. Its aim is to address a wide variety of global challenges, such as extreme poverty, gender inequality, rule of law, climate change and its impacts, or to protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.<sup>5</sup> There are numerous possibilities how to achieve sustainable development regarding the continuous destruction of the environment. One of them is the use of artificial intelligence, which may significantly accelerate the process of achieving the UN Sustainable Development Goals. Thanks to the widespread use of satellites, mobile phones, sensors and financial transaction technologies there is now more information than ever on the state of the planet.<sup>6</sup> Artificial intelligence in the analysed area may improve weather and natural disaster predictions, or they can help monitor, model and manage environmental systems, whether it is illegal logging, water degradation,<sup>7</sup> illegal fishing and poaching,<sup>8</sup> air pollution or the burden of farming.<sup>9</sup> In general, artificial intelligence applications could help design more energy-efficient buildings improve power storage and optimise renewable energy deployment by feeding solar and wind power into the electricity grid as needed. On the other hand, it is also important to point out that artificial intelligence poses serious challenges for the environment and, consequently, climate change. There are energy consumption concerns around artificial intelligence, algorithms and the processing of large amounts of data.<sup>10</sup> At the same time, production, service and final disposal of artificial intelligence systems require vast amounts of non-renewable materials (such as lithium, nickel or cobalt) and efficient e-waste

---

<sup>4</sup> See footnotes no. 15 – 24 and 28 – 33.

<sup>5</sup> UN General Assembly: *Transforming our world: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1, p. 14. Online: <https://www.refworld.org/docid/57b6e3e44.html> (cited 31 May 2022).

<sup>6</sup> UN Science-Policy-Business Forum on Environment: *White Paper: Digital Earth: Building, Financing and Governing a Digital Ecosystem for Planetary Data*, Draft 1, February 2018, p. 5 – 29. Online: <https://www.un-spbf.org/wp-content/uploads/2019/03/Digital-Ecosystem-final.pdf> (cited 31 May 2022).

<sup>7</sup> CHUI, M. et al.: *Notes From the AI Frontier: Applying AI for Social Good*, McKinsey Global Institute, December 2018, p. 26 - 27.

Online:

<https://www.mckinsey.com/~media/mckinsey/featured%20insights/artificial%20intelligence/applying%20artificial%20intelligence%20for%20social%20good/mgi-applying-ai-for-social-good-discussion-paper-dec-2018.ashx> (cited 31 May 2022).

<sup>8</sup> *Ibid.*, p. 24 – 25.

<sup>9</sup> UNESCO: *Artificial Intelligence for Sustainable Development: challenges and opportunities for UNESCO's science and engineering programmes*, Working Paper, August 2019, p. 14.

Online: <https://unesdoc.unesco.org/ark:/48223/pf0000368028> (cited 31 May 2022).

Slovenská technická univerzita v Bratislave, Úrad podpredsedu vlády SR pre investície a informatizáciu: *Analýza a návrh možností výskumu, vývoja a aplikácie umelej inteligencie na Slovensku: Dielo č. 2 – Manuál pre firmy na zavedenie umelej inteligencie*, 11 December 2019, p. 86. Online: <https://www.mirri.gov.sk/wp-content/uploads/2020/03/Dielo2-Manual.pdf> (cited 31 May 2022).

<sup>10</sup> NESLEN, A.: *Here's how AI can help fight climate change*, World Economic Forum, 11 August 2021. Online: <https://www.weforum.org/agenda/2021/08/how-ai-can-fight-climate-change/> (cited 31 May 2022).

management, respectively.<sup>11</sup> The aim of the paper is to analyse the existing international legislation in the context of meeting the goals of sustainable development in the field of climate action through artificial intelligence and to point out potential legal challenges of its use. Before that, it is necessary to briefly introduce the concept of sustainable development from the international law perspective, its historical background and current development.

## II. INTERNATIONAL LAW AND SUSTAINABLE DEVELOPMENT

International community for the past decades focuses on activities that are able to ensure sustainable development in many areas. Sustainable development, as such, may be defined as a development, which as a necessary procedural step, “takes into account” environmental protection (integration), and which does so in a way that is consistent with the environmental treaty obligations undertaken by a State or, at the very least, with the core content of customary international environmental law applicable to all countries.<sup>12</sup> For a long time, international legal scholars are debating the legal and normative status of the sustainable development concept. On one side, as Barral states “for some, the answer to the question of its relationship to the law is straightforward: sustainable development does not belong to law: it may be an important philosophical or political objective, but it is not a legal one.”<sup>13</sup> Lowe observes that the concept lacks norm-creating character, and that it can properly claim a normative status as an element of the process of judicial reasoning. Furthermore, he considers sustainable development as a meta-principle, a legal concept exercising a kind of “interstitial normativity”, pushing and pulling the boundaries of true primary norms when they threaten to overlap or conflict with each other. This means that where two primary norms come into conflict, the principle of sustainable development, as an interstitial norm, can serve to clarify how the two norms are to be balanced in a particular case. For example, where two primary norms come into conflict, such as the norm of economic development and the norm of environmental protection, the principle of sustainable development as an interstitial norm can serve to clarify how these two norms are to be balanced in a particular case.<sup>14</sup> On the contrary, Vinuales states that sustainable development is a peculiar type of norm, a “normative concept”, which cannot perform some functions unless it is decomposed into more specific norms.<sup>15</sup>

It has been referred to in legal practice, not only in policy instruments<sup>16</sup> such as the Rio Declaration on Environment and Development<sup>17</sup>, United Nations Millennium Declaration<sup>18</sup> or the 2030 Agenda for Sustainable Development<sup>19</sup>, but also in international treaties and decisions

---

<sup>11</sup> LEAL FILHO, W. et al.: *Deploying artificial intelligence for climate change adaptation*, Technological Forecasting & Social Change, Vol. 180, 2022, p. 2, ISSN: 0040-1625.

<sup>12</sup> DUPUY, P.-M., LE MOLI, G., VINUALES, J. E.: *Customary International Law and the Environment*. In: RAJAMANI, L., PEEL, J. (eds.): *The Oxford Handbook of International Environmental Law*, Second Edition, Oxford: Oxford University Press, 2021, p. 385 - 401, ISBN: 978-0-19-884915-5.

<sup>13</sup> BARRAL, W.: *Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm*, The European Journal of International Law, Vol. 23, No. 2, 2012, p. 378, ISSN: 0938-5428.

<sup>14</sup> LOWE, V.: *Sustainable Development and Unsustainable Arguments*. In: BOYLE, A. et. al (eds.): *International Law and Sustainable Development: Past Achievements and Future Challenges*, Oxford: Oxford University Press, 1999, p. 31, ISBN: 978-0-19-829807-6.

<sup>15</sup> VINUALES, J. E.: *Sustainable Development*, in: RAJAMANI, L., PEEL, J. (eds.): *The Oxford Handbook of International Environmental Law*, Second Edition, Oxford: Oxford University Press, 2021, p. 292, ISBN: 978-0-19-884915-5.

<sup>16</sup> For instance, *Report of the United Nations Conference on Environment and Development*, A/CONF.151/26/Rev.1 (Vol. I), Rio de Janeiro, 3 – 14 June 1992; *Report of the World Summit on Sustainable Development*, Johannesburg, 26 August – 4 September 2002, UN General Assembly: *The future we want, Annex*, A/RES/66/288, 27 July 2012; High-level political forum on sustainable development: *Political declaration of the high-level political forum on sustainable development convened under the auspices of the General Assembly, Annex*, A/HLPF/2019/L.1, 9 September 2019.

<sup>17</sup> *Rio Declaration on Environment and Development*, UN Doc. A/CONF.151/26 (vol. I), 31 ILM 874 (1992), Rio de Janeiro, 14 June 1992.

<sup>18</sup> UN General Assembly: *United Nations Millennium Declaration*, A/RES/55/2, 18 September 2000. Online: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N00/559/51/PDF/N0055951.pdf?OpenElement> (cited 31 May 2022).

<sup>19</sup> UN General Assembly: *Transforming our world: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1.

of judicial and quasi-judicial organs. Most commonly cited are the United Nations Framework Convention on Climate Change<sup>20</sup>, Kyoto Protocol to the United Nations Framework Convention on Climate Change<sup>21</sup>, Aarhus Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters<sup>22</sup>, Paris Agreement<sup>23</sup>, Convention on Biological Diversity<sup>24</sup> or the United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa.<sup>25</sup> In most cases conventional provisions relating to sustainable development are too soft to impose an obligation on States to develop sustainability. But they may still impose an obligation on States to “strive to achieve” or “promote” sustainable development.<sup>26</sup> Barrel argues that the sustainable development should be considered as an objective. If the subject needs only to endeavor to achieve the result, rather than be under an absolute obligation to reach it, it is because, in the case of obligations of means, the achievement of this result is more unpredictable, and not fully under the subject’s control. The obligation thus contains only a duty to employ best efforts, a category of obligations known to international law as “due diligence” obligations.<sup>27</sup>

Some authors, such as Sands, on the contrary argue, “there can be little doubt that the concept of sustainable development has entered the corpus of international customary law requiring different streams of international law to be treated in an integrated manner.”<sup>28</sup> To substantiate this claim, it is often referred to a limited number of decisions that makes explicit reference to the concept of sustainable development, which supports the proposition that “sustainable” development means development in accordance with customary international environmental law. In the *Gabčíkovo-Nagymaros* case, the International Court of Justice (ICJ) referred for the first time to the need to reconcile economic development with protection of the environment, which is aptly expressed in the concept of sustainable development.<sup>29</sup> Judge Weeramantry in his separate opinion to the judgement in *Gabčíkovo-Nagymaros* case expressed the opinion that the normative value of sustainable development derives in part from its wide and general acceptance by the global community, which is shown by its adoption in multilateral treaties, international declarations, the practice of international financial institutions, planning documents and state practice. Weeramantry considered sustainable development as a legal principle of customary international law with an *erga omnes* character.<sup>30</sup> In the *Iron Rhine* Arbitration, the tribunal specifically discussed the *Gabčíkovo-Nagymaros* case and concluded that “where development may cause significant harm to the environment there is a duty to prevent, or at least mitigate, such harm”.<sup>31</sup> This duty, in the opinion of the tribunal, has now become a principle of general international law.<sup>32</sup> Paragraph 222 of the award explicitly refers to the prevention principle recognized as a customary norm in the ICJ’s *Advisory Opinion on*

---

<sup>20</sup> *United Nations Framework Convention on Climate Change*, New York: United Nations, General Assembly, 9 May 1992, Art. 3.4.

<sup>21</sup> *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, Kyoto, 11 December 1997, Arts. 2.1, 10, 12.2.

<sup>22</sup> *Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters*, Aarhus, 25 June 1998, Preamble.

<sup>23</sup> *Paris Agreement*, Paris, 12 December 2015, Arts. 2.1, 4.1, 6.1, 6.2, 6.4, 6.8, 6.9, 7.1, 8.1, 10.5.

<sup>24</sup> *Convention on Biological Diversity*, Rio de Janeiro, 5 June 1992, Art. 8 (e).

<sup>25</sup> *United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa*, Paris, 14 October 1994, Arts. 1 (b), 5 (b), 9.1, 18.1.

<sup>26</sup> BARRAL, W.: *Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm*, The European Journal of International Law, Vol. 23, No. 2, 2012, p. 385, ISSN: 0938-5428.

<sup>27</sup> *Ibid.*, p. 390.

<sup>28</sup> SANDS, P.: *Principles of International Environmental Law*, 2nd edition, Cambridge: Cambridge University Press, 2003, p. 254, ISBN: 978-0-51-181351-1.

<sup>29</sup> *The Gabčíkovo-Nagymaros Project (Hungary v. Slovakia)*, Judgment, I.C.J. Reports 1997, para. 140.

<sup>30</sup> *Ibid.*, Separate Opinion of Judge Weeramantry, p. 88 and 118.

<sup>31</sup> *Iron Rhine Arbitration (Belgium v. the Netherlands)*, Permanent Court of Arbitration, 2003-02, 24 May 2005, para. 222.

<sup>32</sup> *Ibid.*, paras. 57 – 59 and 222.

the Legality of Nuclear Weapons.<sup>33</sup> In the Pulp Mills case, the ICJ reasoned that the need to integrate economic and environmental considerations embodied in the concept of sustainable development was achieved in casu through the performance of both the procedural and the substantive obligations laid down by the (applicable river treaty).<sup>34</sup> In turn, these obligations were presented as specific treaty applications of core customary norms, namely the prevention principle, the customary requirement to conduct an environmental impact assessment, and the duty of cooperation.<sup>35</sup> There are also other international judicial and quasi-judicial decisions supporting the normative status of sustainable development,<sup>36</sup> which for the purposes of this paper will not be further analysed. As Mahbub states, sustainable development represents a concept which can influence the outcome of cases, the interpretation of treaties and the practice of states and international organizations, and may lead to significant changes and developments in the existing law.<sup>37</sup>

The concept of sustainable development, as such, consists of substantive, as well as procedural elements. The substantive elements can be deduced from the Principles 3 – 8 of the Rio Declaration on Environment and Development, which include (a) sustainable utilization of natural resources, (b) integration of environmental protection and economic development, (c) inter and intra generational equity and (d) right to development.<sup>38</sup> In terms of procedural elements, it includes (a) public participation in decision making and (b) access to information and environmental impact assessment.<sup>39</sup> Another category of principles can be drawn from the international environmental law and is intended to provide assistance in achieving sustainable development. These principles are (1) States sovereignty over natural resources and responsibility not to cause environmental damage (commonly known as the ‘no harm’ principle), (2) international cooperation, (3) common but differentiated responsibility, (4) precautionary principle, (5) polluter pays principle,<sup>40</sup> (6) principle of human right to the environment, (7) principle of protection and conservation of the environment and natural resources and (8) principle of fair use of natural resources shared by two or more countries.<sup>41</sup>

## 1. International Initiatives in Sustainable Development

Historically, the modern understating of the concept is associated with the 1972 Stockholm Conference on the Human Environment. Despite the fact that “sustainable development” was not mentioned, the connection between economic development and environmental protection was established in the principles of the Stockholm Declaration on the Human Environment. Particularly relevant are the principles no. 4, 13, 15 – 20, which reflect on different areas, such as safeguarding and managing wildlife and its habitat, management of resources, planning of

<sup>33</sup> *Legality of the Threat or Use of Nuclear Weapons*, Advisory Opinion, I.C.J. Reports 1996, para. 29.

<sup>34</sup> *Pulp Mills on the River Uruguay (Argentina v. Uruguay)*, Judgment, I.C.J. Reports 2010, para. 75 – 77.

<sup>35</sup> VINALES, J. E.: *Sustainable Development*. In: RAJAMANI, L., PEEL, J. (eds.): *The Oxford Handbook of International Environmental Law*, Second Edition, Oxford: Oxford University Press, 2021, p. 291, ISBN: 978-0-19-884915-5.

<sup>36</sup> For instance, *State obligations in Relation to the Environment (Advisory Opinion)*, Inter-American Court on Human Rights, OC-23/17, 2017; *Social and Economic Rights Action Center and the Center for Economic and Social Rights v. Nigeria*, African Commission on Human Rights and People’s Rights, Communication No. 155/96, 2001; *United States - Import Prohibition of Certain Shrimp and Shrimp Products*, World Trade Organization, Appellate Body Report 1998, WTO Doc. WT/DS58/AB, 12 October 1998.

<sup>37</sup> MAHBUB, N. T.: *Sustainable Development and Its Evolution in the Realm of International Environmental Law*, Nnamdi Azikiwe University Journal of International Law and Jurisprudence, Vol. 7, No. 1, 2016, p. 11, ISSN: 2276-7371. Online: <https://www.ajol.info/index.php/naujilj/article/view/136234/125724> (cited 31 May 2022).

<sup>38</sup> *Rio Declaration on Environment and Development*, UN Doc. A/CONF.151/26 (vol. I), 31 ILM 874 (1992), Rio de Janeiro, 14 June 1992, Principles 3 – 8.

<sup>39</sup> *Ibid.*, Principles 10 – 17.

<sup>40</sup> MAHBUB, N. T.: *Sustainable Development and Its Evolution in the Realm of International Environmental Law*, Nnamdi Azikiwe University Journal of International Law and Jurisprudence, Vol. 7, No. 1, 2016, p. 4, ISSN: 2276-7371. Online: <https://www.ajol.info/index.php/naujilj/article/view/136234/125724> (cited 31 May 2022).

<sup>41</sup> JANKUV, J.: *Environmentalizácia medzinárodného práva verejného a jej vplyv na právo Európskej únie a právny poriadok Slovenskej republiky*, Praha: Nakladatelství Leges, 2021, p. 85, ISBN: 978-80-7502-580-7.

human settlement and urbanization, planning, managing or controlling the environmental resources, population growth, science and technology, or education in environmental matters.<sup>42</sup> The expression “sustainable development” was, however, used in 1980 by the International Union for Conservation of Nature and Natural Resources in its *World Conservation Strategy: Living Resource Conservation for Sustainable Development*.<sup>43</sup> The abovementioned report influenced drafting of the “Our Common Future”, also known as the “1987 Brundtland Report”. The Brundtland Report laid the foundations for defining the principle of sustainable development as a development that meets the needs of the present without compromising the ability of future generations to meet their own needs. It contains within it two key concepts: (1) the concept of ‘needs’, in particular the essential needs of the world’s poor, to which overriding priority should be given; and (2) the idea of limitations imposed by the state of technology and social organization on the environment’s ability to meet present and future needs.<sup>44</sup> It is also worth mentioning the 1992 Rio Conference on Environment and Development that is considered as a fundamental landmark in sustainable development. During the Rio Conference, the sustainable development was not only officially endorsed by the international community, but it became the unavoidable paradigm of environment/development relations.<sup>45</sup> The outcome document - Rio Declaration on Environment and Development, although legally non-binding, formulated principles in strong legal terms. It is also undeniably a declaration of legal principles about sustainable development.<sup>46</sup> During the conference, the Agenda 21 was also adopted, which presents a global action plan on development and environmental cooperation. It addresses issues of population, human health, human settlements and the fight against poverty. It also deals with the protection of the atmosphere, biodiversity, water resources and forests, combating desertification and drought, rural development and the use of toxic substances, including radioactive ones. It calls for the integration of environmental concerns into decision-making processes, and not only by governments but also non-state actors.<sup>47</sup> In 2000, during the Millennium Summit in New York, the Millennium Declaration was adopted. Its importance is emphasized by the introduction of eight development goals to be achieved by 2015. The Millennium Development Goals encompass goals to (1) eradicate extreme poverty and hunger, (2) achieve universal primary education, (3) promote gender equality and empower women, (4) reduce child mortality, (5) improve maternal health, (6) combat HIV/AIDS, malaria and other diseases, (7) ensure environmental sustainability a (8) develop a global partnership for development.<sup>48</sup> Further development of the sustainable development concept is also visible through the outcome documents<sup>49</sup> of the Johannesburg World Summit on Sustainable

---

<sup>42</sup> *The Stockholm Declaration on the Human Environment*, United Nations Conference on the Human Environment, Stockholm, 16 June 1972, principles 4, 13, 15 – 20.

Online: <https://wedocs.unep.org/bitstream/handle/20.500.11822/29567/ELGP1StockD.pdf?sequence=1&isAllowed=y> (cited 31 May 2022).

<sup>43</sup> IUCN, UNEP, WWF: *World Conservation Strategy: Living Resource Conservation for Sustainable Development*, 1980. Online: <https://portals.iucn.org/library/efiles/documents/WCS-004.pdf> (cited 31 May 2022).

<sup>44</sup> World Commission on Environment and Development: *The Report of the World Commission on Environment and Development: Our Common Future*, Geneva, 1987, A/42/427, p. 41.

Online: <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf> (cited 31 May 2022).

<sup>45</sup> BARRAL, W.: *Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm*, *The European Journal of International Law*, Vol. 23, No. 2, 2012, p. 379, ISSN: 0938-5428.

<sup>46</sup> *Ibid.*

<sup>47</sup> *Agenda 21*, United Nations Conference on Environment & Development, Rio de Janeiro, 3 – 14 June 1992, p. 3 – 351. Online: <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf> (cited 31 May 2022).

<sup>48</sup> UN General Assembly: *United Nations Millennium Declaration*, A/RES/55/2, 18 September 2000. Online: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N00/559/51/PDF/N0055951.pdf?OpenElement> (cited 31 May 2022).

<sup>49</sup> *Political Declaration and Plan of Implementation of the World Summit on Sustainable Development*. For more see: United Nations: *Report of the World Summit on Sustainable Development*, Johannesburg, 26 August – 4 September 2002, A/CONF.199/20, p. 1 – 72.

Online: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N02/636/93/PDF/N0263693.pdf?OpenElement> (cited 31 May 2022).

Development (2002), whose aim was to review the progress in implementing the outcomes of the 1992 Rio Conference. Key commitments were made on water, energy, health, agriculture, biological diversity and other areas of concern.<sup>50</sup> Ten years later, at the Rio Conference on Sustainable Development (2012) the process to develop a set of Sustainable Development Goals that are built on the Millennium Development Goals was launched. Furthermore, the outcome document of the 2012 Rio Conference “The Future that We Want” reaffirmed the Rio principles (such as the principle of common but differentiated responsibilities), and past actions plans that were adopted in order to achieve sustainable development. The declaration includes broad sustainability objectives within themes of Poverty Eradication, Food Security and Sustainable Agriculture, Energy, Sustainable Transport, Sustainable Cities, Health and Population and Promoting Full and Productive Employment. States also adopted innovative guidelines on green economy policies,<sup>51</sup> and put in place a strategy for financing sustainable development.<sup>52</sup>

The latest step towards the sustainable development presents the United Nations Summit on Sustainable Development, which took place in New York in 2015. During this conference, the United Nations Sustainable Development Goals were adopted. Since the mentioned goals are analysed in the following chapter, we will not pay more attention to them in this chapter. However, it is worth mentioning the Stockholm +50 high-level meeting that will take place in Stockholm in the beginning of June 2022. Anchored in the Decade of Action, under the theme “Stockholm+50: a healthy planet for the prosperity of all – our responsibility, our opportunity,” will commemorate the 1972 United Nations Conference on the Human Environment and celebrate 50 years of global environmental action. By recognizing the importance of multilateralism in tackling the Earth’s triple planetary crisis – climate, nature, and pollution – the event aims to act as a springboard accelerate the implementation of the UN Decade of Action to deliver the Sustainable Development Goals, including the 2030 Agenda, Paris Agreement on climate change, the post-2020 global Biodiversity Framework, and encourage the adoption of green post-COVID-19 recovery plans.<sup>53</sup> The Stockholm +50 meeting presents an opportunity to (1) support a universal recognition of the human right to a clean, healthy and sustainable environment, (2) explore rights of nature, (3) mainstream alternative knowledge systems and (4) enhance youth, women, indigenous peoples and local communities engagement in decision making around sustainability transitions.

Since the 1990s, virtually all countries have rallied behind the concept of sustainable development and that, in turn, has facilitated the adoption of several treaty regimes bringing together developed and developing countries. Yet, that convening power was premised on the “original sin” of sustainable development: its deliberate vagueness. Such vagueness has become a major obstacle in attempts to go beyond mere adoption of new law and into its effective implementation.<sup>54</sup> As it will be further analysed in chapter III. International Regulation of Artificial Intelligence in Climate Action, only a limited number of international legally binding instruments regulate the activities of States and other subjects of international law, when achieving sustainable development goals in various areas.

---

<sup>50</sup> *Ibid.*

<sup>51</sup> For instance, the green economy policies in the context of sustainable development and poverty eradication should be consistent with international law, respect each State’s national sovereignty over their natural resources, be supported by an enabling environment and well-functioning institutions at all levels, promote sustainable consumption and production patterns. For more see United Nations: *Report of the United Nations Conference on Sustainable Development*, Rio de Janeiro, 20 – 22 June 2012, A/CONF.216/16, para. 58.

<sup>52</sup> United Nations: *Report of the United Nations Conference on Sustainable Development*, Rio de Janeiro, 20 – 22 June 2012, A/CONF.216/16, p. 1 – 54.  
Online: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N12/461/64/PDF/N1246164.pdf?OpenElement> (cited 31 May 2022).

<sup>53</sup> For more see the official website of the Stockholm +50 meeting: <https://www.stockholm50.global/>.

<sup>54</sup> VINUALES, J. E.: *Sustainable Development*, in: RAJAMANI, L., PEEL, J. (eds.): *The Oxford Handbook of International Environmental Law*, Second Edition, Oxford: Oxford University Press, 2021, p. 286, ISBN: 978-0-19-884915-5.

## 2. United Nations Sustainable Development Goals

A modern milestone in achieving sustainable development is the 2030 Agenda for Sustainable Development, which was adopted by the UN Member States at the 2015 summit as an attempt to integrate economic, social and environmental dimensions of development. The 2030 Agenda consists of 17 sustainable development goals and 169 targets that are global in nature and universally applicable, taking into account different national realities, capacities and levels of development and respecting national policies and priorities for the period of 15 years, starting from January 2016. It builds on the Millennium Development Goals, which were not achieved, such as gender inequality and women empowerment, or environmental sustainability.<sup>55</sup> Seventeen sustainable development goals are integrated and balance three dimensions of sustainable development. As stated in the preamble of the 2030 Agenda, the international community is determined to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations.<sup>56</sup> Targets are defined as aspirational and global, with each Government setting its own national targets guided by the global level of ambition but taking into account national circumstances. Each Government decides how these aspirational and global targets should be incorporated into national planning processes, policies and strategies.<sup>57</sup> For instance, Slovakia introduced six national priorities for the implementation of the 2030 Agenda, which focuses on (1) education, (2) transformation towards an environmentally sustainable and knowledge-based economy in the context of demographic change, (3) poverty reduction and social inclusion, (4) sustainability of settlements, regions and the countryside in the context of climate change, (5) rule of law, democracy and security, and (6) good health.<sup>58</sup> After five years, 2020 Report on the results achieved in the national priorities for the implementation of the 2030 Agenda concludes that Slovakia has been achieving good results in the national priority Poverty Reduction and Social Inclusion, however, challenges persist in the remaining national priorities, markedly in national priorities of Sustainable Cities, Regions and Countries in the Context of Climate Change, Rule of Law, Democracy and Security, and Good Health. Compared to the European Union average, Slovakia achieves better results in several social sustainable development goals, including poverty reduction and inequality. Some progress has also been made in the areas of good health and wellbeing of people and quality education, although in these indicators, the Slovakia lags behind the European union average. However, environmental pressures and the changing climate have negative effects on the sustainable development of the Slovakia. There has also been a less favourable development in the area of low-emission energy consumption and resource productivity. Slovakia still faces problems in strengthening climate action, affordable and clean energy and more responsible consumption and production.<sup>59</sup>

For the purposes of this paper, our main focus is on the goal no. 13 – Take urgent action to combat climate change and its impacts. Mentioned goal is, however, interconnected with other sustainable development goals, such as goal no. 7 - Ensure access to affordable, reliable,

---

<sup>55</sup> United Nations: *The Millennium Development Goals Report 2015*, New York, 2015, p. 8 – 9, ISBN: 978-92-1-101320-7. Online: [https://www.un.org/millenniumgoals/2015\\_MDG\\_Report/pdf/MDG%202015%20rev%20\(July%2015\).pdf](https://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%2015).pdf) (cited 31 May 2022).

<sup>56</sup> UN General Assembly: *Transforming our world: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1, preamble, p. 2. Online: <https://www.refworld.org/docid/57b6e3e44.html> (cited 31 May 2022).

<sup>57</sup> *Ibid.*, para. 55.

<sup>58</sup> *Voluntary National Review of the Slovak Republic on the Implementation of the 2030 Agenda for Sustainable Development*, 2018, p. 19 – 61.

Online: [https://sustainabledevelopment.un.org/content/documents/20131Agenda2030\\_VNR\\_Slovakia.pdf](https://sustainabledevelopment.un.org/content/documents/20131Agenda2030_VNR_Slovakia.pdf) (cited 31 May 2022).

<sup>59</sup> Ministry of Investments, Regional Development and Informatization of the Slovak Republic: *2020 Report on the results achieved in the national priorities for the implementation of the 2030 Agenda*, September 2020, p. 61. Online: [https://www.mirri.gov.sk/wp-content/uploads/2020/12/EN\\_Sprava\\_dosiahnute\\_vysledky\\_A2030.pdf](https://www.mirri.gov.sk/wp-content/uploads/2020/12/EN_Sprava_dosiahnute_vysledky_A2030.pdf) (cited 31 May 2022).



sustainable and modern energy for all; goal no. 11 – Make cities and human settlements inclusive, safe, resilient and sustainable; goal no. 14 – Conserve and sustainably use the oceans, seas and marine resources for sustainable development; and goal no. 15 – Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.<sup>60</sup> This interconnection expands the possibility of using artificial intelligence to achieve these goals, as well as possible legal challenges that may arise. Finally yet importantly, it creates space for the application of existing legal norms within the framework of international environmental law, as well as in the area of emerging corpus of norms regulating the use of artificial intelligence. We discuss this aspect in more detail in the chapter III. International Regulation of Artificial Intelligence in Climate Action.

The 2030 Agenda sets five goal targets regarding climate action:

(1) Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries;

(2) Integrate climate change measures into national policies, strategies and planning;

(3) Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning;

(4) Implement the commitment undertaken by developed-country parties to the United Nations Framework Convention on Climate Change to a goal of mobilizing jointly \$100 billion annually by 2020 from all sources to address the needs of developing countries in the context of meaningful mitigation actions and transparency on implementation and fully operationalize the Green Climate Fund through its capitalization as soon as possible;

(5) Promote mechanisms for raising capacity for effective climate change-related planning and management in least developed countries and small island developing States, including focusing on women, youth and local and marginalized communities.<sup>61</sup>

The 2022 Intergovernmental Panel on Climate Change Report emphasizes that digital technologies can contribute to mitigation of climate change and the achievement of several sustainable development goals. Currently, the artificial intelligence systems are used in Japan to send disaster alerts regarding tsunami flooding,<sup>62</sup> in Brazil to monitor the process of deforestation in the Amazon<sup>63</sup> or in China as a tool to design smart cities.<sup>64</sup> Artificial intelligence and other digital technologies can improve energy management in all sectors, increase energy efficiency, and promote the adoption of many low-emission technologies, including decentralised renewable energy, while creating economic opportunities. However, some of these climate change mitigation gains can be reduced or counterbalanced by growth in demand for goods and services due to the use of digital devices. Digitalisation can involve trade-offs across several sustainable development goals, e.g., increasing electronic waste, negative impacts on labour markets, and exacerbating the existing digital divide.<sup>65</sup> For instance,

---

<sup>60</sup> For more detail on specific goal targets see: UN General Assembly: *Transforming our world: the 2030 Agenda for Sustainable Development*, 21 October 2015, A/RES/70/1, p. 21 - 25. Online: <https://www.refworld.org/docid/57b6e3e44.html> (cited 31 May 2022).

<sup>61</sup> *Ibid.*, p. 23.

<sup>62</sup> Tohoku University: *Fujitsu Leverages World's Fastest Supercomputer and AI to Predict Tsunami Flooding*, 16 February 2021. Online: <https://www.preventionweb.net/news/fujitsu-leverages-worlds-fastest-supercomputer-and-ai-predicts-tsunami-flooding> (cited 31 May 2022).

<sup>63</sup> ERTHAL ABDENUR, A.: *How Can Artificial Intelligence Help Curb Deforestation in the Amazon?*, IPI Global Observatory, 23 November 2020. Online: <https://theglobalobservatory.org/2020/11/how-can-artificial-intelligence-help-curb-deforestation-amazon/> (cited 31 May 2022).

<sup>64</sup> QUAN, Ch.: *Top 8 Smart Cities in China*, China Highlights, 2 March 2021. Online: <https://www.chinahighlights.com/travelguide/top-china-smart-cities.htm> (cited 31 May 2022).

<sup>65</sup> Intergovernmental Panel on Climate Change: *Climate Change 2022: Impacts, Adaptation and Vulnerability*, Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 27 February 2022, B.4.3. Online: [https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\\_AR6\\_WGII\\_FinalDraft\\_FullReport.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_FullReport.pdf) (cited 31 May 2022).

the training of neural network in natural language processing has severe costs for the environment due to the carbon footprint required to fuel modern tensor processing hardware.<sup>66</sup> Strubell et al. noted that training a single artificial intelligence model can emit as much carbon as five cars in their lifetime.<sup>67</sup> The European's Parliament's special committee on Artificial Intelligence in a Digital Age reached the same conclusion in its study *The role of Artificial Intelligence in the European Green Deal*. The study focused on the positive and negative impacts of artificial intelligence associated with the goals of the European Green Deal<sup>68</sup>, which in many ways are pivotal for the achievement of the UN Sustainable Development Goals. Most of the international initiatives around artificial intelligence do not sufficiently consider the environmental dimension of sustainable development.<sup>69</sup> Moreover, a better understanding of the pathways and dynamics by which input is processed in artificial intelligence based decisions might help to tailor adequate regulatory measures. Environmental policy and research should therefore focus on further assessing the systemic effects of artificial intelligence. Without proper steering, there is the risk that artificial intelligence based research with potential to contribute to a green transition may not be prioritised if their expected economic benefit is not high.<sup>70</sup>

### III. INTERNATIONAL REGULATION OF ARTIFICIAL INTELLIGENCE IN CLIMATE ACTION

Public international law is the system of norms and principles that regulate behaviour between subjects of international law. While it may not be immediately apparent, that international law should have any role to play in regulating either the development or deployment of artificial intelligence, throughout its history international law has, at times, been quite creative in responding to the need to protect the international community from the excesses of, and possibly catastrophic and even existential risks posed by technology. Admittedly, the traditional approach of international law to the regulation of emerging technologies has been one of reaction rather than pro-action; only attempting to evaluate and regulate their development or use ex post facto. Regulating uncertain, unknown, and even unknowable futures requires flexibility, transparency, accountability, participation by a whole range of actors beyond the State, and the ability to obtain, understand, and translate scientific evidence into law, even while the law remains a force for stability and predictability.<sup>71</sup>

Before we turn our focus to the international regulation of artificial intelligence in climate action, it is necessary to point out the applicable international legal framework in the area concerning Sustainable Development Goal No. 13. As it was mentioned before, States' adopted measures in climate action must reflect on the existing customary norms and principles of the international environmental law, especially do no harm principle, environmental impact

---

<sup>66</sup> STRUBELL, E., GANESH, A., McCALLUM, A.: *Energy and Policy Considerations for Deep Learning in Natural Language Processing*. In: *Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL)*. Florence, Italy, July 2019, p. 3645 - 3650. Online: <https://arxiv.org/abs/1906.02243> (cited 31 May 2022).

<sup>67</sup> *Ibid.*, p. 3650.

<sup>68</sup> For more on the *European Green Deal* see: 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 Regions – European Green Deal*, Brussels, 11 December 2019, COM(2019) 640 final. Online: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2019%3A640%3AFIN>.

<sup>69</sup> GAILHOFER, P. et al.: *The role of Artificial Intelligence in the European Green Deal*, Study for the special committee on Artificial Intelligence in a Digital Age (AIDA), Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2021, p. 10. Online: [https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662906/IPOL\\_STU\(2021\)662906\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662906/IPOL_STU(2021)662906_EN.pdf) (cited 31 May 2022).

<sup>70</sup> *Ibid.*, p. 10 – 11.

<sup>71</sup> RAYFUSE, R.: *Public International Law and the Regulation of Emerging Technologies*. In: BROWNSWORD, R., SCOTFORD, E., YEUNG, K. (eds.): *The Oxford Handbook of Law, Regulation and Technology*, Oxford: Oxford University Press, 2017, p. 500 - 501, ISBN: 978-0-19-968083-2.

assessment, precautionary principle, principle of human right to the environment, principle of protection and conservation of the environment and natural resources. When we turn to international treaties, there are several (with a large number of contracting Parties) whose aim is to combat climate change and its impacts. Particularly, the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol to the UNFCCC and the Paris Agreement. Although the mentioned multilateral treaties do not regulate artificial intelligence per se, they provide States Parties with goals, commitments, principles and mechanisms that indirectly regulate their use in climate action, especially when it comes to negative effects on climate change.

The considerable role of the UNFCCC in international law has been confirmed, inter alia, in the 2030 Agenda, where the UN Member States confirmed that it is the primary international, intergovernmental forum for negotiating the global response to climate change. The aim of the UNFCCC is to achieve stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.<sup>72</sup> The Convention provides State Parties with, inter alia, principles that shall guide them in their actions to achieve the objective of the Convention and to implement its provisions. Especially relevant in the context of this paper is Principle 3, in accordance with which the State Parties should take precautionary measures to anticipate, prevent or minimize the causes of climate change and mitigate its adverse effects. Where there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing such measures, taking into account that policies and measures to deal with climate change should be cost-effective so as to ensure global benefits at the lowest possible cost.<sup>73</sup> The Art. 4 (f) builds on this principle and obliges the State Parties to take climate change considerations into account, to the extent feasible, in their relevant social, economic and environmental policies and actions, and employ appropriate methods, for example impact assessments, formulated and determined nationally, with a view to minimizing adverse effects on the economy, on public health and on the quality of the environment, of projects or measures undertaken by them to mitigate or adapt to climate change.<sup>74</sup> Other articles relevant to the achievement of Sustainable Development Goal No. 13 are Art. 6 on education, training and public awareness and Art. 11 on financial mechanism. Since the mentioned articles do not, even indirectly, affect the regulation of artificial intelligence in climate action, we will not analyse them further, as well as similar provisions of the Kyoto Protocol and the Paris Agreement.

When we turn to the Kyoto Protocol, it operationalizes the UNFCCC by committing industrialized countries and economies in transition to limit and reduce greenhouse gases emissions in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system, in accordance with agreed individual targets.<sup>75</sup> Despite some skeptical assessments, the Protocol is particularly important in terms of establishing institutional structure, financial and information mechanisms for climate change.<sup>76</sup> Each Party included in Annex I in achieving its quantified emission limitation and reduction commitments under Art.

---

<sup>72</sup> *United Nations Framework Convention on Climate Change*, New York: United Nations, General Assembly, 9 May 1992, Art. 2.

<sup>73</sup> *Ibid.*, Art. 3 (3).

<sup>74</sup> *Ibid.*, Art. 4 (f).

<sup>75</sup> *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, Kyoto, 11 December 1997, Annex I.

<sup>76</sup> JANKUV, J.: *Ochrana klímy v práve životného prostredia Európskej únie a prístup Slovenskej republiky k tejto problematike desať rokov po jej vstupe do Európskej únie*. In: KLUČKA, J. (ed.): *10 rokov v EÚ: Vzťahy, otázky, problémy*, Košice: Univerzita Pavla Jozefa Šafárika v Košiciach, 2014, p. 100, ISBN: 978-80-8152-208-6. Online: [https://www.upjs.sk/public/media/1084/Zbornik\\_41.pdf](https://www.upjs.sk/public/media/1084/Zbornik_41.pdf) (cited 31 May 2022).

3, in order to promote sustainable development, shall, inter alia, implement and/or further elaborate policies and measures in accordance with its national circumstances, such as enhancement of energy efficiency in relevant sectors of the national economy.<sup>77</sup> Furthermore, Annex I State Parties shall cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance access to, and transfer of, environmentally sound technologies.<sup>78</sup>

Last but not least, we turn to the 2015 Paris Agreement. The Paris Agreement has a number of features that may influence how countries adapt, improve, or create new domestic processes in order to comply with its obligations. All parties to the Agreement are required to maintain a nationally determined contribution (NDC) that outlines their self-defined mitigation goals.<sup>79</sup> They are legally obligated to pursue domestic measures with the aim of achieving those goals.<sup>80</sup> The Agreement reaffirms the UNFCCC goal of keeping average warming below two degrees Celsius while pursuing efforts to limit the temperature increase even further to 1.5 degrees Celsius above pre-industrial levels, recognizing that this would significantly reduce the risks and impacts of climate change. Furthermore, to increase the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production; and to make finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.<sup>81</sup> Every five years, they must update or communicate a new NDC.<sup>82</sup> Regarding the use of artificial intelligence in combating climate change, we may analogically apply Art. 10 (1) under which the parties share a long-term vision on the importance of fully realizing technology development and transfer in order to improve resilience to climate change and to reduce greenhouse gas emissions.<sup>83</sup> This provision, in a way, restricts State Parties to use artificial intelligence systems that have or may have adverse impact on climate change. However, such regulation is worded too vaguely which has only limited effect on the use of artificial intelligence systems in climate action. As Huang argues, governments will also need to take into account information from the global stocktake in their target-setting process. The review processes and climate change committees tasked with assessing new science and updating or realigning the ambition of interim targets in climate framework laws make this work pro forma and ostensibly provide for greater accountability over time.<sup>84</sup> At the 2021 Glasgow Climate Change Conference (COP26), the Glasgow Climate Pact, reflecting the interconnection between sustainable development goals and climate change, calls upon Parties to accelerate the development, deployment and dissemination of technologies, and the adoption of policies, to transition towards low-emission energy systems, including by rapidly scaling up

---

<sup>77</sup> *Kyoto Protocol to the United Nations Framework Convention on Climate Change*, Kyoto, 11 December 1997, Art. 2 (a) (i).

<sup>78</sup> *Ibid.*, Art. 10 (c).

<sup>79</sup> *Paris Agreement*, Paris, 12 December 2015, Art. 4 (2).

<sup>80</sup> HUANG, J.: *Exploring Climate Framework Laws and the Future of Climate Action*, Pace Environmental Law Review, Vol. 38, Issue 2, 2021, p. 310 – 311, ISSN: 0738-6206.  
Online: <https://digitalcommons.pace.edu/cgi/viewcontent.cgi?article=1849&context=pehr> (cited 31 May 2022).

<sup>81</sup> *Paris Agreement*, Paris, 12 December 2015, Art. 2 (a), (b), (c).

<sup>82</sup> *Ibid.*, Art. 9.

<sup>83</sup> *Ibid.*, Art. 10 (1).

<sup>84</sup> HUANG, J.: *Exploring Climate Framework Laws and the Future of Climate Action*, Pace Environmental Law Review, Vol. 38, Issue 2, 2021, p. 313, ISSN: 0738-6206.  
Online: <https://digitalcommons.pace.edu/cgi/viewcontent.cgi?article=1849&context=pehr> (cited 31 May 2022).

the deployment of clean power generation and energy efficiency measures, including accelerating efforts towards the phasedown of unabated coal power and phase-out of inefficient fossil fuel subsidies, while providing targeted support to the poorest and most vulnerable in line with national circumstances and recognizing the need for support towards a just transition.<sup>85</sup> States at the COP26 recognized the importance of international collaboration on innovative climate action, including technological advancement, across all actors of society, sectors and regions, in contributing to progress towards the objective of the UNFCCC and the goals of the Paris Agreement.<sup>86</sup> It is, however, questionable, if the outcome documents of the future Climate Change Conferences will have a greater impact on the regulation of artificial intelligence in climate action. Most of the commitments in the area of climate change and sustainable development are formulated too general and even legally binding documents do not impose hard obligations on the subjects of international law, and there are no effective sanction mechanisms.

### 1. International Legal Framework on Artificial Intelligence

The first issue that arises regarding the international legal framework on artificial intelligence is the legal definition of artificial intelligence. From the international law perspective, there is no generally accepted legal definition of artificial intelligence. The lack of a definition hampers further discussions on possible international cooperation in the analysed area, and in practice, it is difficult to adopt international legislation, the concept and subject of which is not clearly definable.<sup>87</sup> Most of the documents concerning definition or the regulation of artificial intelligence itself are of non-binding nature and define ethical standards, which should be used by developers, manufactures and users of artificial intelligence. One of the most frequently used instruments is the Ethics Guidelines for Trustworthy AI, drafted by the High-Level Expert Group on AI, which was set out by the European Commission in June 2018. In accordance with the Ethics Guidelines for Trustworthy AI, artificial intelligence systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal.<sup>88</sup> The proposal of the EU Artificial Intelligence Act, uses the term “artificial intelligence system” which is defined as “software that is developed with one or more of the techniques and approaches listed in Annex I<sup>89</sup> and can, for a given set of human-defined objectives, generate outputs such as content, predictions, recommendations, or decisions influencing the environments they interact with.”<sup>90</sup> For an internationally acceptable definition of artificial intelligence, it is necessary that such a definition meets **the following**

---

<sup>85</sup> *The Glasgow Climate Pact*, Decision -/CP.26, advance unedited version, 13 November 2021, para. 20. Online: [https://unfccc.int/sites/default/files/resource/cop26\\_auv\\_2f\\_cover\\_decision.pdf](https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf) (cited 31 May 2022).

<sup>86</sup> *Ibid.*, para. 53.

<sup>87</sup> KLUČKA, J.: *General Overview of the Artificial Intelligence and International Law*. In: KLUČKA, J., BAKOŠOVÁ, L. SISÁK, L. (eds.): *Artificial Intelligence from the Perspective of Law and Ethics: Contemporary Issues, Perspectives and Challenges*, Praha: Nakladatelství Leges, 2021, p. 13, ISBN: 978-80-7502-590-6.

<sup>88</sup> High-Level Expert Group on Artificial Intelligence: *Ethics Guidelines for Trustworthy AI*, Independent High-Level Expert Group on Artificial Intelligence Set Up by the European Commission, Brussels, 8 April 2019, p. 36. Online: <https://ec.europa.eu/futurium/en/ai-alliance-consultation.1.html> (cited 31 May 2022).

<sup>89</sup> (a) Machine learning approaches, including supervised, unsupervised and reinforcement learning, using a wide variety of methods including deep learning; (b) Logic- and knowledge-based approaches, including knowledge representation, inductive (logic) programming, knowledge bases, inference and deductive engines, (symbolic) reasoning and expert systems; (c) Statistical approaches, Bayesian estimation, search and optimization methods.

<sup>90</sup> European Union: *Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial Intelligence Act) and Amending Certain Union Legislative Acts*, Brussels, 21 April 2021, 2021/0106(COD), art. 3.

requirements: (i) inclusiveness, (ii) accuracy, (iii) complexity, (iv) feasibility and (v) consistency.<sup>91</sup>

Currently, artificial intelligence is primarily regulated by domestic law or self-regulated by the industry main actors. It should be noted that more than 160 organizational, national and international sets of rules concerning ethical and guiding principles of artificial intelligence have been developed to date, but unfortunately there is no common platform for converging or harmonizing them because there is no body of international coordination and cooperation of States.<sup>92</sup> Moreover, no universal treaty regime exists to regulate artificial intelligence, as such, in order to limit its potential risks and negative impacts. Public international law will largely play a bystander's role insofar as commercial autonomous solutions meant for civilian use are concerned. However, the international community may at some point feel the need to harmonize countries' domestic laws to ensure that the internal legal regulation of these commercial technologies is consistent across borders. As Vihul argues, the legal mechanism for harmonization would be the adoption of a so-called uniform law treaty that obligates States that are parties to the instrument to legislate domestically with respect to their criminal, civil or administrative laws. For example, such a treaty could prescribe uniform safety standards, liability rules, certification schemes, data management processes, human supervision requirements over the use of the technology, fail-safe mechanisms to be put in place, operational constraints, rules regarding bias, and criminal offences involving autonomous technologies.<sup>93</sup> We argue that the adoption of an international treaty on artificial intelligence (whether on general artificial intelligence or artificial intelligence in a specific area) is in the upcoming years highly unlikely. As it is noted above, it is difficult to regulate an object that is rapidly evolving and for the most part challenges like explainability, transparency or prevention of harm persist. Another question might be, if States would be willing to become a contracting party to a treaty. We observe that States, even on the domestic level, tend to adapt only strategies on artificial intelligence, which do not hamper with the development of new artificial intelligence systems. For now, it seems that the existing norms of public international law as such or norms of international environmental law, or international human rights law, provide some sort "cornerstones" that regulate subjects of international law in the analysed area. However, it has to be noted that non-state actors play an important role in development and use of climate artificial intelligence, but are not bound by most of the norms of international law.

Due to the absence of international legally binding instruments regulating artificial intelligence in general, as well as in the area of climate change, we shall turn to non-legally binding instruments that were adopted on the universal level in order to fulfil potential legal gaps. One of them is the OECD Principles on Artificial Intelligence, which signals States' consensus on core principles that should regulate artificial intelligence, although not specifically oriented on the so-called climate artificial intelligence. The recommendation sets out five principles based on the values of responsible stewardship of trustworthy artificial intelligence, namely:

- a) Artificial intelligence should benefit people and the planet through inclusive growth, sustainable development and prosperity;
- b) Artificial intelligence systems should be designed to respect the rule of law, human rights, democratic values and diversity, and should include appropriate safeguards – for example, allowing for human intervention if necessary – in order to ensure a just society;

---

<sup>91</sup> KLUČKA, J.: *General Overview of the Artificial Intelligence and International Law*. In: KLUČKA, J., BAKOŠOVÁ, L., SISÁK, E. (eds.): *Artificial Intelligence from the Perspective of Law and Ethics: Contemporary Issues, Perspectives and Challenges*, Praha: Nakladatelství Leges, 2021, p. 13 - 14, ISBN: 978-80-7502-590-6.

<sup>92</sup> *Ibid.*, p. 15.

<sup>93</sup> VIHUL, L.: *International Legal Regulation of Autonomous Technologies*, Centre for International Governance Innovation, 16 November 2020. Online: <https://www.cigionline.org/articles/international-legal-regulation-autonomous-technologies/> (cited 31 May 2022).

- c) there should be transparency and responsible publicity about artificial intelligence systems to ensure that people understand and can challenge artificial intelligence-based results;
- d) Artificial intelligence systems must operate reliably and safely throughout their life cycles and potential risks should be continuously assessed and managed;
- e) organizations and individuals developing, implementing or operating artificial intelligence systems should be responsible for their proper functioning in accordance with the above principles.<sup>94</sup>

As Klučka argues, these principles prefer human-centred approaches in relation to the future development of artificial intelligence, reduce disparities between countries and to ensure a minimum level of guarantees for all people.<sup>95</sup>

The regulation of artificial intelligence may also be affected by ethical standards and codes, that are adopted at a universal level. Such an example is the UNESCO Recommendation on the Ethics of Artificial Intelligence, which aims to set standards for the regulation of artificial intelligence in United Nations Member States. The objective of the recommendation, inter alia, is to provide a universal framework of values, principles and actions to guide States in the formulation of their legislation, policies or other instruments regarding artificial intelligence, consistent with international law.<sup>96</sup> The recommendation contains universal values – which artificial intelligence technologies should promote rather than endanger, such as human dignity, protection and promotion of human rights and fundamental freedoms, environmental and ecosystem flourishing, ensuring diversity and inclusiveness, living in peaceful, just and interconnected societies.<sup>97</sup> It also contains principles, which can be seen as artificial intelligence systems design guidance, namely: (a) proportionality and do no harm; (b) safety and security; (c) fairness and non-discrimination; (d) sustainability; (e) right to privacy, and data protection; (f) human oversight and determination; (g) transparency and explainability; (h) responsibility and accountability; (i) awareness and literacy; (j) multi-stakeholder and adaptive governance and collaboration.<sup>98</sup> As for the latter principle, international law and national sovereignty must be respected in the use of data. That means that States, complying with international law, can regulate the data generated within or passing through their territories, and take measures towards effective regulation of data, including data protection, based on respect for the right to privacy in accordance with international law and other human rights norms and standards. Participation of different stakeholders throughout the artificial intelligence system life cycle is necessary for inclusive approaches to artificial intelligence governance, enabling the benefits to be shared by all, and to contribute to sustainable development. Measures should be adopted to take into account shifts in technologies, the emergence of new groups of stakeholders, and to allow for meaningful participation by marginalized groups, communities and individuals and, where relevant, in the case of indigenous peoples, respect for the self-governance of their data.<sup>99</sup> Environmental considerations are included in both the values and the principles sections. UNESCO makes the following recommendations when it comes to ecosystem-friendly design: (1) reducing the carbon footprint; (2) considering environmental risk factors; (3) eliminating unsustainable exploitation of natural resources.<sup>100</sup>

<sup>94</sup> OECD: *Principles on Artificial Intelligence*, 22 May 2019, OECD/LEGAL/0449, p. 7–8. Online: <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449> (cited 31 May 2022).

<sup>95</sup> KLUČKA, J.: *General Overview of the Artificial Intelligence and International Law*. In: KLUČKA, J., BAKOŠOVÁ, L., SISÁK, E. (eds.): *Artificial Intelligence from the Perspective of Law and Ethics: Contemporary Issues, Perspectives and Challenges*, Praha: Nakladatelství Leges, 2021, p. 17, ISBN: 978-80-7502-590-6.

<sup>96</sup> UNESCO: *Recommendation on the Ethics of Artificial Intelligence*, SHS/BIO/PI/2021/1, 23 November 2021, para. 8 (a). Online: <https://unesdoc.unesco.org/ark:/48223/pf0000381137> (cited 31 May 2022).

<sup>97</sup> *Ibid.*, para. 13 – 24.

<sup>98</sup> *Ibid.*, para. 25 – 47.

<sup>99</sup> *Ibid.*, para. 46 and 47.

<sup>100</sup> *Ibid.*, para. 84 – 86.

When it comes to documents focusing specifically on artificial intelligence and climate change, in November 2021, the Global Partnership on Artificial Intelligence in cooperation with Climate Change AI<sup>101</sup> and Centre for AI & Climate<sup>102</sup> introduced the Climate Change and AI: Recommendations for Government report, which highlights 48 specific recommendations for how governments can both support the application of artificial intelligence to climate challenges and address the climate-related risks that artificial intelligence poses. The Global Partnership on Artificial Intelligence is an organisation formed of 24 States<sup>103</sup> and the EU that brings together artificial intelligence and subject matter experts from around the world to help shape the development of artificial intelligence. Its mission is to support and guide the responsible adoption of artificial intelligence that is grounded in human rights, inclusion, diversity, innovation, economic growth, and societal benefit, while seeking to address the UN Sustainable Development Goals. Currently, the organisation is developing a global responsible artificial intelligence adoption strategy for climate action and biodiversity preservation.

The report, which was presented at the Glasgow Climate Change Conference calls for governments to:

- (1) Improve data ecosystems in sectors critical to climate transition, including the development of digital twins in e.g. the energy or transport sector.
- (2) Increase support for research, innovation, and deployment through targeted funding, infrastructure, and improved market designs.
- (3) Make climate change a central consideration in artificial intelligence strategies to shape the responsible development of artificial intelligence as a whole.
- (4) Support greater international collaboration and capacity building to facilitate the development and governance of artificial intelligence-for-climate solutions.<sup>104</sup>

More specifically, it is recommended that the Governments establish and implement standards and best practices guiding the responsible practice and participatory design of artificial intelligence in climate contexts. This includes standards for assessing whether artificial intelligence is relevant or well-suited for a particular problem; for repeated iteration with stakeholders and impacted communities throughout problem scoping, development, deployment, and maintenance; and for auditing the impacts of solutions from the climate and broader social perspectives. Such standards could, for instance, be established within the context of broader initiatives on ethical and responsible artificial intelligence within international bodies, professional organizations, or other contexts.<sup>105</sup> Regarding the facilitation of data creation and open data standards, it is recommended that all data of the climate-critical industries should be made open except where there are privacy, security, commercial, or governance concerns that can not be mitigated.<sup>106</sup> It is also recommended that Governments set methodological standards for impact assessments at the national and international level. This includes developing a taxonomy that can help decide how to assess different types of systems and application areas.<sup>107</sup>

---

<sup>101</sup> Climate Change AI is an international non-profit organization that catalyzes work at the intersection of climate change and AI by providing education and infrastructure, advancing discourse, and building partnerships.

<sup>102</sup> The Centre for AI & Climate is a center dedicated to accelerating the adoption of data science and artificial intelligence to support faster action on climate change. Its mission is to connect capabilities across technology, policy, and business to accelerate the application of data science and artificial intelligence in climate solutions.

<sup>103</sup> Member States of the Global Partnership on Artificial Intelligence are: Australia, Belgium, Brazil, Canada, the Czech Republic, Denmark, France, Germany, India, Ireland, Israel, Italy, Japan, Republic of Korea, Mexico, the Netherlands, New Zealand, Poland, Singapore, Slovenia, Spain, Sweden, the United Kingdom and the United States.

<sup>104</sup> Global Partnership on Artificial Intelligence, Climate Change AI and Centre for AI & Climate: *Climate Change and AI: Recommendations for Government*, November 2021, p. 10 – 12. Online: <https://www.gpai.ai/projects/climate-change-and-ai.pdf> (cited 31 May 2022).

<sup>105</sup> *Ibid.*, p. 26.

<sup>106</sup> *Ibid.*, p. 32.

<sup>107</sup> *Ibid.*, p. 56.



When it comes to the future of regulation of artificial intelligence in climate action, it is important that the international community in order to mitigate the downside effects of artificial intelligence and reconcile tensions between and across sustainable development goals, shape the right path towards the technology's implementation. In doing so, there needs to be infrastructure for national innovations systems, mapping for trajectories and interconnectedness of sustainable development goals, open data and a robust pool of artificial intelligence talent to operationalise applications for sustainable development goals, and the mitigation of misuse and malicious uses of artificial intelligence.<sup>108</sup>

#### IV. CONCLUSION

Far-reaching negative effects of climate change are putting pressure on the international community to adopt appropriate climate actions with regard to the United Nations Sustainable Development Goals. The use of artificial intelligence may be one of the tools to achieve the goals set in the 2030 Agenda. The paper highlighted several examples of artificial intelligence that can be used to achieve appropriate climate action, such as weather and natural disaster predictions, or they can help monitor, model and manage environmental systems, design more energy-efficient buildings. However, as it was pointed out, artificial intelligence also poses serious challenges for the environment. Especially, when it comes to energy consumption, production, service and final disposal of artificial intelligence systems. Since the introduction of the concept of sustainable development, the international community adopted several agendas and international treaties that aim to reduce the degradation of the environment, especially climate. Despite of the fact, that there are international legally binding instruments connected to climate action, such as the UNFCCC, Kyoto Protocol or the Paris Agreement, their impact is only limited, especially due to the character of the obligations contained therein. It may be concluded that most of the climate action that States implement are of non-binding nature, which make a lot of leeway not only for the States but also for non-state actors designing, manufacturing or using artificial intelligence systems in achieving the Sustainable Development Goal no. 13, as well as other goals that are closely linked to climate change. As it is typical for the international legislation, the introduction of new technology into our daily lives is faster than the adoption of adequate legislature. The same is true for legal regulation of artificial intelligence, whether in a general or specific sense. It may seem that systems using artificial intelligence are often developed and used in an ethical and legal vacuum, although, it has to be noted that it is considerably difficult to regulate something unknown, unpredictable and rapidly evolving. To this date, there is no international legally binding instrument specifically regulating artificial intelligence in climate action. However, the existing customary norms of the international environmental law, as well as some norms connected with the sustainable development concept are applicable to the use of artificial intelligence in climate action. In the paper, we have analysed, in addition to legally binding documents, several non-binding instruments, which may influence the future use as well as legal regulation of artificial intelligence in climate action. Particular focus in the paper was dedicated to the OECD Principles on Artificial Intelligence, UNESCO Recommendation on the Ethics of Artificial Intelligence, and the Climate Change and AI: Recommendations for Government report. All of the analysed documents encompass core principles that should be followed, not only by States, but also other stakeholders in the climate change and artificial intelligence area. Typical for all of the mentioned documents is a human-centred approach, which is particularly connected with the protection of human rights and fundamental freedoms (e.g. protection of personal data and

---

<sup>108</sup> MIAILHE, N., HODES, C., JAIN, A. et al.: *AI for Sustainable Development Goals*. In: DELPHI – Interdisciplinary Review of Emerging Technologies, Vol. 2, No. 4, 2019, p. 211, ISSN: 2626-3734. Online: [https://delphi.lexxion.eu/article/DELPHI/2019/4/0?utm\\_source=li&utm\\_medium=li&utm\\_campaign=li\\_post\\_organic&utm\\_content=delphi219](https://delphi.lexxion.eu/article/DELPHI/2019/4/0?utm_source=li&utm_medium=li&utm_campaign=li_post_organic&utm_content=delphi219) (cited 31 May 2022).

human dignity) as well as principles of international environmental law, such as do no harm principle or the precautionary principles.

Into future, the international community will be, if not it already is, faced with the question of appropriate legal regulation of artificial intelligence that would reflect on various aspects and legal challenges of the use of artificial intelligence in climate action. We conclude that the international community is currently not prepared to adopt an international legally binding instrument in the analysed area. It seems that the binding norms on artificial intelligence in the following years will be adopted only at the domestic level. Although, it must be noted that currently there are only several States around the world, which regulate some aspects of the development or use of artificial intelligence, such as data acquisition, use, and de-anonymization, data privacy and ownership, accountability, safety and certification. The same is also true for the public international law. Contemporary and future artificial intelligence innovations, as well as, international legal regulation of artificial intelligence will have to take into account the existing ethical and legal regulation, especially the existence of treaty and customary norms of public international law, more specifically norms of international environmental law, international human rights law or other potential areas. We may expect further development of soft-law instruments, whose aim is to fulfil the existing ethical and legal gaps in the international regulation of climate artificial intelligence.

#### KEY WORDS

Sustainable development, artificial intelligence, public international law, climate action, UN Sustainable Development Goals

#### KLÚČOVÉ SLOVÁ

Udržateľný rozvoj, umelá inteligencia, medzinárodné právo verejné, klimatické opatrenia, Ciele udržateľného rozvoja OSN

#### BIBLIOGRAPHY

1. Agenda 21, United Nations Conference on Environment & Development, Rio de Janeiro, 3 – 14 June 1992, 351 p. Online: <https://sustainabledevelopment.un.org/content/documents/Agenda21.pdf> (cited 31 May 2022).
2. BARRAL, W.: Sustainable Development in International Law: Nature and Operation of an Evolutive Legal Norm, *The European Journal of International Law*, Vol. 23, No. 2, 2012, p. 377 - 400, ISSN: 0938-5428. DOI: <https://doi.org/10.1093/ejil/chs016>.
3. Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters, Aarhus, 25 June 1998.
4. Convention on Biological Diversity, Rio de Janeiro, 5 June 1992.
5. DUPUY, P.-M., LE MOLI, G., VINUALES, J. E.: Customary International Law and the Environment. In: RAJAMANI, L., PEEL, J. (eds.): *The Oxford Handbook of International Environmental Law*, Second Edition, Oxford: Oxford University Press, 2021, p. 385 - 401, ISBN: 978-0-19-884915-5. DOI: <https://doi.org/10.1093/law/9780198849155.003.0023>.
6. ERTHAL ABDENUR, A.: How Can Artificial Intelligence Help Curb Deforestation in the Amazon?, IPI Global Observatory, 23 November 2020. Online: <https://theglobalobservatory.org/2020/11/how-can-artificial-intelligence-help-curb-deforestation-amazon/> (cited 31 May 2022).
7. European Union: Proposal for a Regulation of the European Parliament and of the Council Laying Down Harmonised Rules on Artificial Intelligence (Artificial

- Intelligence Act) and Amending Certain Union Legislative Acts, Brussels, 21 April 2021, 2021/0106(COD).
8. GAILHOFER, P. et al.: The role of Artificial Intelligence in the European Green Deal, Study for the special committee on Artificial Intelligence in a Digital Age (AIDA), Policy Department for Economic, Scientific and Quality of Life Policies, European Parliament, Luxembourg, 2021, 70 p. Online: [https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662906/IPOL\\_STU\(2021\)662906\\_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2021/662906/IPOL_STU(2021)662906_EN.pdf) (cited 31 May 2022).
  9. High-Level Expert Group on Artificial Intelligence: Ethics Guidelines for Trustworthy AI, Independent High-Level Expert Group on Artificial Intelligence Set Up by the European Commission, Brussels, 8 April 2019, 41 p. Online: <https://ec.europa.eu/futurium/en/ai-alliance-consultation.1.html> (cited 31 May 2022).
  10. HUANG, J.: Exploring Climate Framework Laws and the Future of Climate Action, *Pace Environmental Law Review*, Vol. 38, Issue 2, 2021, p. 285 – 326, ISSN: 0738-6206.  
Online:  
<https://digitalcommons.pace.edu/cgi/viewcontent.cgi?article=1849&context=pehr> (cited 31 May 2022).
  11. Intergovernmental Panel on Climate Change: Climate Change 2022: Impacts, Adaptation and Vulnerability, Working Group II contribution to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change, 27 February 2022. Online: [https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC\\_AR6\\_WGII\\_FinalDraft\\_FullReport.pdf](https://www.ipcc.ch/report/ar6/wg2/downloads/report/IPCC_AR6_WGII_FinalDraft_FullReport.pdf) (cited 31 May 2022).
  12. Iron Rhine Arbitration (Belgium v. the Netherlands), Permanent Court of Arbitration, 2003-02, 24 May 2005
  13. IUCN, UNEP, WWF: World Conservation Strategy: Living Resource Conservation for Sustainable Development, 1980. Online: <https://portals.iucn.org/library/efiles/documents/WCS-004.pdf> (cited 31 May 2022).
  14. JANKUV, J.: Environmentalizácia medzinárodného práva verejného a jej vplyv na právo Európskej únie a právny poriadok Slovenskej republiky, Praha: Nakladatelství Leges, 2021, 388 p., ISBN: 978-80-7502-580-7.
  15. JANKUV, J.: Ochrana klímy v práve životného prostredia Európskej únie a prístup Slovenskej republiky k tejto problematike desať rokov po jej vstupe do Európskej únie. In: KLUČKA, J. (ed.): 10 rokov v EÚ: Vzťahy, otázky, problémy, Košice: Univerzita Pavla Jozefa Šafárika v Košiciach, 2014, p. 95 - 121, ISBN: 978-80-8152-208-6. Online: [https://www.upjs.sk/public/media/1084/Zbornik\\_41.pdf](https://www.upjs.sk/public/media/1084/Zbornik_41.pdf) (cited 31 May 2022).
  16. KLUČKA, J.: General Overview of the Artificial Intelligence and International Law. In: KLUČKA, J., BAKOŠOVÁ, L. SISÁK, Ľ. (eds.): Artificial Intelligence from the Perspective of Law and Ethics: Contemporary Issues, Perspectives and Challenges, Praha: Nakladatelství Leges, 2021, p. 13 - 24, ISBN: 978-80-7502-590-6.
  17. Kyoto Protocol to the United Nations Framework Convention on Climate Change, Kyoto, 11 December 1997.
  18. LEAL FILHO, W. et al.: Deploying artificial intelligence for climate change adaptation, *Technological Forecasting & Social Change*, Vol. 180, 2022, p. 2 - 20, ISSN: 0040-1625. DOI: <https://doi.org/10.1016/j.techfore.2022.121662>.
  19. Legality of the Threat or Use of Nuclear Weapons, Advisory Opinion, I.C.J. Reports 1996, p. 226.
  20. LOWE, V.: Sustainable Development and Unsustainable Arguments. In: BOYLE, A. et. al (eds.): International Law and Sustainable Development: Past Achievements and

- Future Challenges, Oxford: Oxford University Press, 1999, ISBN: 978-0-19-829807-6. DOI: <https://doi.org/10.1093/acprof:oso/9780198298076.003.0002>.
21. MAHBUB, N. T.: Sustainable Development and Its Evolution in the Realm of International Environmental Law, Nnamdi Azikiwe University Journal of International Law and Jurisprudence, Vol. 7, No. 1, 2016, p. 1 - 16, ISSN: 2276-7371. Online: <https://www.ajol.info/index.php/naujilj/article/view/136234/125724> (cited 31 May 2022).
  22. MIAILHE, N., HODES, C., JAIN, A. et al.: AI for Sustainable Development Goals. In: DELPHI – Interdisciplinary Review of Emerging Technologies, Vol. 2, No. 4, 2019, p. 207 – 216, ISSN: 2626-3734. DOI: <https://doi.org/10.21552/delphi/2019/4/10>.
  23. Ministry of Investments, Regional Development and Informatization of the Slovak Republic: 2020 Report on the results achieved in the national priorities for the implementation of the 2030 Agenda, September 2020, 61 p. Online: [https://www.mirri.gov.sk/wp-content/uploads/2020/12/EN\\_Sprava\\_dosiahnute\\_vysledky\\_A2030.pdf](https://www.mirri.gov.sk/wp-content/uploads/2020/12/EN_Sprava_dosiahnute_vysledky_A2030.pdf) (cited 31 May 2022).
  24. NESLEN, A.: Here's how AI can help fight climate change, World Economic Forum, 11 August 2021. Online: <https://www.weforum.org/agenda/2021/08/how-ai-can-fight-climate-change/> (cited 31 May 2022).
  25. OECD: Principles on Artificial Intelligence, 22 May 2019, OECD/LEGAL/0449. Online: <https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0449> (cited 31 May 2022).
  26. Paris Agreement, Paris, 12 December 2015.
  27. Pulp Mills on the River Uruguay (Argentina v. Uruguay), Judgment, I.C.J. Reports 2010, p. 14.
  28. QUAN, Ch.: Top 8 Smart Cities in China, China Highlights, 2 March 2021. Online: <https://www.chinahighlights.com/travelguide/top-china-smart-cities.htm> (cited 31 May 2022).
  29. RAYFUSE, R.: Public International Law and the Regulation of Emerging Technologies. In: BROWNSWORD, R., SCOTFORD, E., YEUNG, K. (eds.): The Oxford Handbook of Law, Regulation and Technology, Oxford: Oxford University Press, 2017, p. 500 - 521, ISBN: 978-0-19-968083-2. DOI: <https://doi.org/10.1093/oxfordhb/9780199680832.013.22>.
  30. Rio Declaration on Environment and Development, UN Doc. A/CONF.151/26 (vol. I), 31 ILM 874 (1992), Rio de Janeiro, 14 June 1992
  31. SANDS, P.: Principles of International Environmental Law, 2nd edition, Cambridge: Cambridge University Press, 2003, 1246 p., ISBN: 978-0-51-181351-1.
  32. SKIBSTED, J. M.: How can we build the green cities of tomorrow?, World Economic Forum, 26 October 2015. Online: <https://www.weforum.org/agenda/2015/10/how-can-we-build-the-green-cities-of-tomorrow/> (cited 31 May 2022).
  33. Slovenská technická univerzita v Bratislave, Úrad podpredsedu vlády SR pre investície a informatizáciu: Analýza a návrh možností výskumu, vývoja a aplikácie umelej inteligencie na Slovensku: Dielo č. 2 – Manuál pre firmy na zavedenie umelej inteligencie, 11 December 2019, 153 p. Online: <https://www.mirri.gov.sk/wp-content/uploads/2020/03/Dielo2-Manual.pdf> (cited 31 May 2022).
  34. STRUBELL, E., GANESH, A., McCALLUM, A.: Energy and Policy Considerations for Deep Learning in Natural Language Processing. In: Proceedings of the 57th Annual Meeting of the Association for Computational Linguistics (ACL), Florence, Italy, July 2019, p. 3645 - 3650. DOI: <https://doi.org/10.18653/v1/p19-1355>.

35. The Gabčíkovo-Nagymaros Project (Hungary v. Slovakia), Judgment, I.C.J. Reports 1997, p. 7.
36. The Glasgow Climate Pact, Decision -/CP.26, advance unedited version, 13 November 2021.  
Online:  
[https://unfccc.int/sites/default/files/resource/cop26\\_auv\\_2f\\_cover\\_decision.pdf](https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf) (cited 31 May 2022).
37. The Stockholm Declaration on the Human Environment, United Nations Conference on the Human Environment, Stockholm, 16 June 1972. Online:  
<https://wedocs.unep.org/bitstream/handle/20.500.11822/29567/ELGP1StockD.pdf?sequence=1&isAllowed=y> (cited 31 May 2022).
38. Tohoku University: Fujitsu Leverages World's Fastest Supercomputer and AI to Predict Tsunami Flooding, 16 February 2021.  
Online: <https://www.preventionweb.net/news/fujitsu-leverages-worlds-fastest-super-computer-and-ai-predict-tsunami-flooding> (cited 31 May 2022).
39. UNESCO: Artificial Intelligence for Sustainable Development: challenges and opportunities for UNESCO's science and engineering programmes, Working Paper, August 2019, 50 p. Online: <https://unesdoc.unesco.org/ark:/48223/pf0000368028> (cited 31 May 2022).
40. UNESCO: Recommendation on the Ethics of Artificial Intelligence, SHS/BIO/PI/2021/1, 23 November 2021.  
Online: <https://unesdoc.unesco.org/ark:/48223/pf0000381137> (cited 31 May 2022).
41. UN General Assembly: Transforming our world: the 2030 Agenda for Sustainable Development, 21 October 2015, A/RES/70/1.  
Online: <https://www.refworld.org/docid/57b6e3e44.html> (cited 31 May 2022).
42. UN General Assembly: United Nations Millennium Declaration, A/RES/55/2, 18 September 2000.  
Online: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N00/559/51/PDF/N0055-951.pdf?OpenElement> (cited 31 May 2022).
43. United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, Paris, 14 October 1994.
44. United Nations Framework Convention on Climate Change, New York: United Nations, General Assembly, 9 May 1992.
45. United Nations: Report of the United Nations Conference on Sustainable Development, Rio de Janeiro, 20 – 22 June 2012, A/CONF.216/16, 92 p. Online: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N12/461/64/PDF/N1246164.pdf?OpenElement> (cited 31 May 2022).
46. United Nations: Report of the World Summit on Sustainable Development, Johannesburg, 26 August – 4 September 2002, A/CONF.199/20, 173 p.  
Online: <https://documents-dds-ny.un.org/doc/UNDOC/GEN/N02/636/93/PDF/N0263693.pdf?OpenElement> (cited 31 May 2022).
47. United Nations: The Millennium Development Goals Report 2015, New York, 2015, 75 p. ISBN: 978-92-1-101320-7.  
Online:  
[https://www.un.org/millenniumgoals/2015\\_MDG\\_Report/pdf/MDG%202015%20rev%20\(July%201\).pdf](https://www.un.org/millenniumgoals/2015_MDG_Report/pdf/MDG%202015%20rev%20(July%201).pdf) (cited 31 May 2022).
48. UN Science-Policy-Business Forum on Environment: White Paper: Digital Earth: Building, Financing and Governing a Digital Ecosystem for Planetary Data, Draft 1,

- February 2018, 37 p. Online: <https://www.un-spbf.org/wp-content/uploads/2019/03/Digital-Ecosystem-final.pdf> (cited 31 May 2022).
49. VIHUL, L.: International Legal Regulation of Autonomous Technologies, Centre for International Governance Innovation, 16 November 2020. Online: <https://www.cigionline.org/articles/international-legal-regulation-autonomous-technologies/> (cited 31 May 2022).
50. VINUALES, J. E.: Sustainable Development. In: RAJAMANI, L., PEEL, J. (eds.): The Oxford Handbook of International Environmental Law, Second Edition, Oxford: Oxford University Press, 2021, p. 285 - 301, ISBN: 978-0-19-884915-5.
51. Voluntary National Review of the Slovak Republic on the Implementation of the 2030 Agenda for Sustainable Development, 2018, 63 p. Online: [https://sustainabledevelopment.un.org/content/documents/20131Agenda2030\\_VNR\\_Slovakia.pdf](https://sustainabledevelopment.un.org/content/documents/20131Agenda2030_VNR_Slovakia.pdf) (cited 31 May 2022).
52. World Commission on Environment and Development: The Report of the World Commission on Environment and Development: Our Common Future, Geneva, 1987, A/42/427, para. 27.  
Online: <https://sustainabledevelopment.un.org/content/documents/5987our-common-future.pdf> (cited 31 May 2022).

#### **CONTACT DETAILS OF THE AUTHOR**

**Mgr. Lucia Bakošová, PhD.**

Researcher

Pavol Jozef Šafárik University in Košice

Faculty of Law, Institute of International Law and European Law

Kováčska 26, P.O.BOX A-45,

040 75 Košice, Slovak Republic

Phone number: + 421 55 234 4158

E-mail: [lucia.bakosova@upjs.sk](mailto:lucia.bakosova@upjs.sk)