HIGHLIGHT OF JOURNAL

Azerbaijan's growing role in the regional green energy transition and COP29
Shahmar Hajiyev

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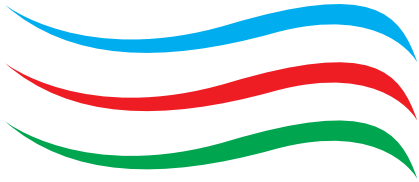

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Editor's Note

The current issue of the Caucasus Strategic Perspectives (CSP) journal entitled ***"Climate, Environment, Peace and Security in the South Caucasus"*** is dedicated to the different aspects of the environment and climate policy, notably in the post-conflict situation and with evolving geoeconomic changes in the South Caucasus region.

The CSP's new issue includes 6 articles. The CSP's current authors analyzed Azerbaijan's green energy policy, new opportunities in the region for this country's renewable energy capacity, impact of landmines on rehabilitation and reconstruction works in Azerbaijan, international humanitarian law providing for the protection of the environment during armed conflict, compensation for environmentally harmful acts committed by Armenia, the environmental repercussions of the occupation of Azerbaijan's territories in the past by Armenia, the environmental aspects of the reconstruction effort, role of multilateral diplomacy in shaping the international environmental regime, Caspian Green Energy Corridor, etc.

The new issue's ***Highlight*** is the comprehensive article of **Shahmar Hajiyev** titled "*Azerbaijan's growing role in the regional green energy transition and COP29*". This article examines Azerbaijan's green energy policy following the liberation of its occupied territories during the Second Garabagh War, including new opportunities for its renewable energy capacity in those territories. By analysing different cooperation initiatives, author argues that Azerbaijan's green growth strategy and green energy projects aim to transform the country into a 'green energy hub' in the South Caucasus region.

The new issue's ***Articles Section*** starts with the co-authored article of **Maurizio Geri, Leyla Gasimova, Aydan Huseynova and Luisa Canciello** titled "*Landmine legacy in Azerbaijan: A threat to reconstruction and sustainable development*". This article aims to shed light on the impact of landmines and the

importance of addressing this issue promptly. Furthermore, it emphasizes the strategic significance of rapid demining for post-conflict reconstruction in the South Caucasus and underscores the need for concerted efforts to ensure development, environmental protection, and stability in the region.

Valentina Chabert's article of "*Reaching peace through responsibility: The role of international arbitration's stance on the South Caucasus' environmental post-war recovery*" explores the current framework of international humanitarian law providing for the protection of the environment during armed conflict, as well as the relationship between the law of occupation and natural resource exploitation. Against this background, the ultimate objective of the article lies in the investigation of Azerbaijan's requests for inter-state arbitration pursuant to the Bern Convention and the Energy Charter Treaty. This is what the present author considers to be potentially the most successful option for Azerbaijan to get compensation for environmentally harmful acts committed by Armenia.

Orkhan Baghirov's article of "*Environmental aspects of the reconstruction process in Garabagh and Eastern Zangezur regions*" aims to analyse the environmental dimensions of the reconstruction process in Azerbaijan's liberated territories. Following the initial analysis of the environmental repercussions of the occupation, the article delves into the environmental aspects of the reconstruction effort, showcasing various measures and projects aimed at revitalizing the region's flora and fauna, promoting renewable energy sources such as wind and solar energy, establishing 'Green Energy Zones' and 'Smart Villages', and employing smart agriculture techniques.

Najiba Mustafayeva's article of "*Multilateral Diplomacy for Shaping the International Environmental Regime: Key Landmark Conferences and COP29 in Azerbaijan*" examines the role of multilateral diplomacy in shaping the international environmental regime and highlights the necessity of shared responsibility and collective efforts. It emphasizes the evolution of international environmental law and the importance of flexible, adaptive treaty frameworks in addressing global environmental problems.

Agha Bayramov's investigates the Caspian–European Union Green Energy Corridor - the corridor that hinges on large-scale renewable energy projects, like the Black Sea and Caspian Sea Electricity Cables, facilitating green energy exports from Azerbaijan, Kazakhstan, and Uzbekistan to Europe – as an a strategic initiative to bolster energy security and diversification in a tense geopolitical climate. The present author also explores the current status, potential for, and obstacles to the Caspian Green Energy Corridor and argues that substantial challenges, including geopolitical instability, technical hurdles, and significant investment needs, threaten the initiative's success.

Finally, on behalf of the CSP team, we hope this issue provides food for thought and contributes to and enriches the discussion on subject-matter issue.

Sincerely
Farid Shafiyev
Editor-in-Chief of CSP Journal

Azerbaijan's growing role in the regional green energy transition and COP29

Shahmar Hajiyev*

Following the liberation of its occupied territories in the Second Garabagh War, Azerbaijan opened new opportunities for its renewable energy capacity in those territories. Yet Azerbaijan's renewable energy portfolio does not merely eye an internal audience, it also has an international dimension. Azerbaijan approved the United Nations Framework Convention on Climate Change (UNFCCC) in 1995 and the Kyoto Protocol in 2000. The country joined the Paris Climate Agreement in 2016 and committed to decreasing the level of GHG emissions by 35% by 2030 compared to the base year (1990). Azerbaijan also has accelerated and increased the deployment of renewable energy sources across the country. In recent years, the country has created 'Green Energy Zones' and initiated the gradual process of decarbonization. Azerbaijan's green growth strategy and green energy projects aim to transform the country into a 'green energy hub' in the region. Notably, on December 17, 2022, Azerbaijan, Georgia, Romania, and Hungary signed an agreement to support the Black Sea submarine cable project to supply electricity from the region to Europe. This project will serve as a 'Green Energy Corridor' that could become a new power source for the EU and may also ensure the export of electricity from Central Asian nations to Europe in the future. The country has declared 2024 'Green World Solidarity Year', and Azerbaijan will host the 29th Conference of the Parties (COP29), an important step demonstrating Azerbaijan's commitment to environmental protection and climate action.

Keywords: Azerbaijan, green economy, renewable energy, green transition, GHG emissions, COP29, Green Energy Zones, Black Sea electric cable

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Introduction

The impacts of climate change have become more evident as greenhouse gas (GHG) emissions from human activities cause increased heat, drought, floods, etc. Changes in the earth's climate balance are negatively affecting many nations around the world. Therefore, climate challenges are a global problem that needs urgent attention from all nations to effectively address the challenges and save our ecosystem. In this context, the Conference of the Parties (COP) to the UN Framework Convention on Climate Change is an important multilateral forum to discuss climate-related issues and an opportunity for governments and the private sector to work together to address climate change.

Moreover, the unstable global energy market has demonstrated the importance of a green transition to ensure long-term energy security and sustainable development. According to the United Nations Environment Programme (UNEP), "*a green economy is defined as low carbon, resource efficient and socially inclusive. In a green economy, growth in employment and income are driven by public and private investment into such economic activities, infrastructure, and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency, and prevention of the loss of biodiversity and ecosystem services*".[1] In this context, the development of renewable energy sources will play a significant role for countries to diversify energy sources and build their energy policies and strategies towards green development.

In 2023, the International Energy Agency (IEA) reported unprecedented growth in global renewable energy capacity, suggesting the potential achievement of a crucial climate target by the decade's end. The world's renewable energy capacity grew by 50% last year (2023) to 510 gigawatts (GW), the 22nd year in a row that renewable capacity additions set a new record. By 2028, the IEA forecasts that renewable energy sources will account for more than 42% of global electricity generation. That would mean tripling global renewable energy by the end of the decade, one of five main climate targets designed to help cut carbon emissions and prevent runaway global heating. The others are doubling energy efficiency, cutting methane emissions, transitioning

1 UN environment program, "Green Economy", Available at: https://www.unep.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/green-economy (Accessed: 25 April 2024).

away from fossil fuels, and scaling up financing for emerging and developing economies.[2]

Azerbaijan places a strong emphasis on achieving sustainable development goals through green energy infrastructure development and the wider use of renewables throughout the economy.

Touching upon Azerbaijan's energy strategy, it should be noted that the energy production of Azerbaijan, as a resource-rich country, is strongly tied to fossil fuels. However, Azerbaijan places a strong emphasis on achieving sustainable development goals through green energy infrastructure development and the wider use of renewables throughout the economy. Transforming the country into 'a country of green growth' is one of the key priorities of Azerbaijan's economic and energy policy.[3]

In the international context, Azerbaijan joined the Paris Climate Agreement in 2016 and made a voluntary commitment to reduce the amount of GHG emissions by 35% by 2030, compared to the base year (1990). In November 2021, during COP26, held in Glasgow (United Kingdom), Azerbaijan renewed its voluntary obligations by pledging to reduce its GHG emissions 40% by 2050 and declaring its liberated territories a 'net-zero emission' zone.[4] In order to speed up the green transition in the country, the government of Azerbaijan has taken several legal measures and is developing a long-term strategy. For example, the Presidential Order on "*Azerbaijan 2030: National Priorities for Socio-Economic Development*" has set goals to take measures to preserve the environment in a clean, healthy, and sustainable condition.[5] Moreover, the "Law on the Use of Renewable Energy Sources in the Production of Electricity", dated May 31, 2021, defined the requirements for using renewable energy sources in the production of electricity, a field of activity that includes the production, storage, transmission, supply, and consumption of electricity from renewable energy sources.[6] Overall, the country targets increasing the

2 Ambrose, J., "World's renewable energy capacity grew at record pace in 2023", *The Guardian,* January 11, 2024, Available at: https://amp.theguardian.com/environment/2024/jan/11/worlds-renewable-energy-capacity-grew-at-record-pace-in-2023 (Accessed: May 1, 2024).

3 President.az, *Order of the President of the Republic of Azerbaijan on approval of "Azerbaijan 2030: National Priorities for Socio-Economic Development*, February 2, 2021, Available at: https://president.az/en/articles/view/50474 (Accessed: June 20, 2024).

4 Ministry of Energy of the Republic of Azerbaijan, "EU Covenant of Mayors for climate and energy - Eastern Partnership", Available at: https://minenergy.gov.az/en/beynelxalq-emekdasliq/merler-razilasmasi_6064 (Accessed: May 1, 2024).

5 *Ibid*.

6 Decree of the President of the Republic of Azerbaijan, on the implementation of the Law No. 339-VIQ dated May 31, 2021 of the Republic of Azerbaijan "On the use of renewable energy sources in the production of electricity", Available at: https://e-qanun.

share of the installed capacity of renewable energy in the country's overall energy balance to 30% by 2030.[7]

Azerbaijan's Green Energy Strategy

A green economy – a holistic economic system that transcends profit margins to prioritize social equity, ecological balance, and robust economic growth – is central to sustainable development. The energy transition, a substantial shift from fossil fuels to renewable energy sources, emerges as the linchpin of our battle against climate change. Renewable energy sources like solar, wind, and hydropower are key to reducing greenhouse gas emissions and staving off the catastrophic consequences of global warming.[8] Azerbaijan supports a sustainable energy future, and transforming the country into a 'green energy hub' is a key component of Azerbaijan's energy policy.

As an energy-rich country, Azerbaijan can make significant contributions to carbon-free energy by supporting net-zero strategies. Relevant laws and normative legal acts have been adopted to develop the renewable energy sector, and to improve the legislative and institutional environment in this area. Azerbaijan's national priorities on the implementation and development of renewable energy sources are outlined in the "*Azerbaijan 2030: National Priorities on Socio-economic Development*" plan. Among the five national priorities, special attention was given to a clean environment and green growth.[9] According to this document, in order to better meet the needs of present and future generations, environmentally friendly green technologies must proliferate. Based on scientific and technological potential, it is necessary to increase the share of alternative and renewable energy sources in primary consumption and reduce impact on climate change in all sectors of the economy.

az/framework/47843 (Accessed: 20 June 2024)

7 Ministry of Energy of the Republic of Azerbaijan, "The Use of Renewable Energy Resources in Azerbaijan", March 6, 2024, Available at: https://minenergy.gov.az/en/alternativ-ve-berpa-olunan-enerji/azerbaycanda-berpa-olunan-enerji-menbelerinden-istifade (Accessed: June 20, 2024).

8 Castanho, R., A., "Green Economy and Renewable Energy Transitions for Sustainable Development" in book "Green Economy and Renewable Energy Transitions for Sustainable Development" (pp.xv-xvii), Publisher: IGI GLOBAL, January 2024,

9 President.az, *Order of the President of the Republic of Azerbaijan on approval of "Azerbaijan 2030: National Priorities for Socio-Economic Development*", February 2, 2021, Available at: https://president.az/en/articles/view/50474 (Accessed: May 5, 2024).

Moreover, as discussed above, the "*Law on the Use of Renewable Energy Sources in the Production of Electricity*" dated May 31, 2021, makes a special contribution to the development of renewable energy in the country by prioritizing the use of renewable energy sources in the production of electricity.[10]

Azerbaijan has increased the number of renewable energy sources and accelerated their deployment. The country's climate conditions offer major potential for electricity generation from solar and wind.

In order to ensure the arrangement and regulation of activities in the field of renewable energy sources and their efficient use in the country, and to support the implementation of state policy, the Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan was established on September 22, 2020. The main objectives of the State Agency are to increase the share of renewable energy sources in the country's installed electricity generation capacity to 30% by 2030, to transform the liberated territories into a 'Green Energy Zone' (GEZ), and to ensure the participation of the private sector in this arena.[11]

In recent years, Azerbaijan has increased the number of renewable energy sources and accelerated their deployment. The country's climate conditions offer major potential for electricity generation from solar and wind. On- and offshore wind farms/clusters, solar power, and hydro will be major renewable energy sources. The potential for solar and wind power generation in particular is very high. The possibilities for wind power development are also very strong, especially on the Absheron Peninsula and the Caspian Sea coastline. Overall, the economic potential of renewable energy sources in Azerbaijan is estimated at 27 GW, including 3,000 MW of wind energy, 23,000 MW of solar energy, 380 MW of bioenergy potential, and 520 MW from mountain rivers, an important source for the generation of electricity to support the energy transition and sustainable development.[12]

The government is also focusing on the development of a long-term energy strategy. This strategy will cover the period to 2050 and reflect

10 "Law of the Republic of Azerbaijan on the use of renewable energy sources in the production of electricity", E-qanun, available at: https://e-qanun.az/framework/47842 (Accessed: April 29, 2024).

11 Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan, "Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan", Available at: https://area.gov.az/en/page/haqqimizda (Accessed: 30 April 2024).

12 Hajiyev, Sh., "Azerbaijan's Green Growth Plan", *News.az*, January 9, 2024, Available at: https://news.az/news/azerbaijans-green-growth-plan-opinion (Accessed: May 8, 2024).

important areas such as electricity and natural gas supply, energy efficiency, and renewables use.[13] The government intends to support a 'twin-pillar' approach to promote sustainable energy to achieve its long-term goals. This process will help the country produce electricity using renewable energy sources while decreasing the use of natural gas for electricity production. Increasing the share of renewables in power generation will also decrease GHG emissions.

Along with the adoption of different laws and strategies, the government of Azerbaijan pays special attention to strengthening energy ties with foreign partners. On July 18, 2022, the European Union and Azerbaijan signed a new "*Memorandum of Understanding on a Strategic Partnership in the Field of Energy*", which supports further cooperation in the field of energy efficiency and renewable energy sources. As noted by the European Commission's President Ursula von der Leyen:

Today, with this new Memorandum of Understanding, we are opening a new chapter in our energy cooperation with Azerbaijan, a key partner in our efforts to move away from Russian fossil fuels. Not only are we looking to strengthen our existing partnership which guarantees stable and reliable gas supplies to EU via the Southern Gas Corridor. We are also laying the foundations of a long-term partnership on energy efficiency and clean energy, as we both pursue the objectives of the Paris Agreement.[14]

This important document opened new opportunities for the country to develop renewable energy sources and facilitate their export to the European energy market.

Developing renewable energy sources in the liberated territories

Following the liberation of the occupied territories after the Second Garabagh War, the country opened up new opportunities for renewable energy in the liberated areas. Together, the Garabagh and East Zangezur regions and the Nakhchivan Autonomous Republic of Azerbaijan have been declared a 'Green Energy Zone' (GEZ). These regions hold vast potential for the development of renewable energy sources such as hydro, solar, and wind. The Japanese company

13 IEA, "Azerbaijan's energy context", Available at: https://www.iea.org/reports/implementing-a-long-term-energy-policy-planning-process-for-azerbaijan-a-roadmap/azerbaijan-s-energy-context (Accessed: June 20, 2024).

14 European Commission, "EU and Azerbaijan enhance bilateral relations, including energy cooperation", July 18, 2022, Available at: https://ec.europa.eu/commission/presscorner/detail/en/ip_22_4550 (Accessed: May 13, 2024).

Following the liberation of the occupied territories after the Second Garabagh War, the country opened up new opportunities for renewable energy in the liberated areas.

TEPSCO and the Ministry of Energy of Azerbaijan have signed an agreement that envisages the effective use of potential renewable energy resources such as wind, solar, hydro, geothermal, and bioenergy in the liberated territories.[15] The purpose of the agreement is to provide the area with environmentally friendly 'green energy' by using the existing high renewable energy potential in the liberated territories and to formulate proposals by studying the prospects for the application of environmentally friendly and energy-efficient green technologies. Also included in the GEZ scheme are electricity generation from renewable energy sources; energy efficiency measures; electric vehicle use; installation of renewable energy facilities (especially solar panels) on roofs; use of solar energy-based LED lamps for street and road lighting; use of renewable energy technologies in heating, cooling, and hot water supply; application of smart energy management; and the design of measures such as targeted waste energy management.

The liberated territories have huge potential for developing hydroenergy. The restoration of existing and construction of new energy infrastructure in the liberated territories are among the main objectives. In accordance with these goals, 20.2 MW of power generating capacity have been reinstated in the form of four restored hydroelectric power plants in the Lachin and Kalbajar districts, and Sugovushan settlement: "Gulabird" hydroelectric power plant (HPP) (8 MW), "Sugovushan-1" small hydroelectric power plant (SHPP) (4.8 MW), "Sugovushan-2" SHPP (3.0 MW), and "Kalbajar-1" SHPP (4.4 MW).[16]

Moreover, SHPPs including "Chirag-1" with a capacity of 8.33 MW, "Chirag-2" with a capacity of 3.6 MW, "Gamishli" with a capacity of 6.33 MW, "Soyugbulag" with a capacity of 5.3 MW, and "Meydan" with a capacity of 3.4 MW were inaugurated after reconstruction in Kalbajar district. Additionally, in 2023, Azerenerji opened the newly built 110 kV "Gorchu" substation in Lachin district and the "Lachin" city hub substation. At the same time, the 8.25 MW "Mishni", 8 MW "Gulabird" and 6 MW "Alkhasli" small hydroelectric power plants in the Lachin district were reconstructed and put into operation, and the 4 MW "Sus" HPP has been restored. More than 77 million kilowatt

15 Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan, "Green Energy Zone (GEZ) in the liberated territories", Available at: https://area.gov.az/en/page/layiheler/yasil-enerji-zonasi/yasil (Accessed: May 13, 2024).

16 *Ibid*.

Azerbaijan is strengthening its international cooperation with different energy companies. One of the main aims of the country is transforming itself into an 'energy hub' exporting not only fossil fuels, but also green energy.

hours of ecologically sourced clean energy have been produced by the HPPs put into operation by Azerenerji OJSC in Lachin district. The production of those 77 million kWh of green energy has saved 18 million cubic meters of gas and millions of tons of Azerbaijani manat (AZN), and avoided the release of 32,000 tons of carbon dioxide into the atmosphere.[17] On May 10, 2024, the "Zabukh" and "Garigishlag" SHPPs in Lachin district, owned by Azerenerji OJSC, were commissioned. The "Zabukh" SHPP has a capacity of 2.8 MW and will produce 8–9 million kWh of green energy annually. The "Garigishlag" SHPP, with a capacity of 4 MW, will produce 11–12 million kWh annually.[18]

Moreover, on May 19, 2024, Azerbaijan and Iran inaugurated the "Giz Galasi" hydroelectric complex on the Aras River. The hydro dam holds 62mn cubic meters of water in its reservoir, enough to supply water to agricultural farmlands in three regions on both sides of the border and generate 270-gigawatt hours of renewable electricity a year using two 40 megawatt powerhouses.[19]

In addition to hydropower, the implementation of wind and solar power plants in the liberated territories will significantly contribute to the green energy transition. The Garabagh region's solar energy potential is estimated at 3,000–4,000 MW, and its wind energy potential at 300–500 MW. For instance, a wind power plant with an estimated capacity of 100 MW in Lachin/Kalbajar districts and a 240 MW solar power plant in the Zangilan/Jabrayil districts will make additional contributions to the creation of the GEZ.[20] The implementation of all the above-mentioned projects and ongoing growth will significantly influence the power generation and export potential of the country.

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17 AzərEnerji, *Four HPPs commissioned in Lachin produce 77 mln kWh of green energy*, Available at: https://azerenerji.gov.az/newsdetail/1873?language=en (Accessed: May 15, 2024).

18 President.az, *Ilham Aliyev participated in inauguration of small hydropower stations,* May 10, 2024, Available at: https://president.az/en/articles/view/65807 (Accessed: May 15, 2024).

19 Intellinews, *Iran, Azerbaijan open border hydro dam on shared river*, Available at: https://www.intellinews.com/iran-azerbaijan-open-border-hydro-dam-on-shared-river-325884/ (Accessed: July 3, 2024).

20 Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan, "Green Energy Zone (GEZ) in the liberated territories", Available at: https://area.gov.az/en/page/layiheler/yasil-enerji-zonasi/yasil (Accessed: May 10, 2024).

International cooperation in the field of renewable energy sources (RES)

International cooperation plays a crucial role in promoting green energy on a global scale. Azerbaijan is strengthening its international cooperation with different energy companies. One of the main aims of the country is transforming itself into an 'energy hub' exporting not only fossil fuels, but also green energy. The country closely cooperates with Saudi-listed ACWA Power, the UAE's global renewables company Masdar, bp, Japanese TEPSCO, and China Gezhouba Group Overseas Investment to implement various green energy projects across the country.[21]

On October 26, 2023, Azerbaijan opened the 230 MW Garadagh Solar Power Plant, the region's largest operational solar plant. The plant was built by Masdar, the UAE's global renewables company, with direct foreign investment worth $262 million. The plant will produce 500 million kilowatt hours of electricity annually, saving 110 million cubic meters of natural gas. At the same time, carbon emissions into the atmosphere will be reduced by 200 thousand tons.[22] Moreover, Masdar has signed agreements for solar and onshore wind projects with a total capacity of 1 GW in Azerbaijan. Strategic agreements signed in June 2022 cover the implementation of the first phase of a 10 GW pipeline of renewable energy projects in the country. Masdar has also signed agreements to develop integrated offshore and onshore wind, green hydrogen, and solar projects with a total combined capacity of 4 GW.[23]

ACWA Power has agreed to develop 500 MW of renewable energy projects in Azerbaijan's Nakhchivan Autonomous Republic with Masdar and the State Oil Company of Azerbaijan Republic (SOCAR). ACWA Power signed implementation agreements with the Ministry of Energy of Azerbaijan for a 1 GW onshore wind farm and a 1.5 GW offshore wind farm with storage. It also has an agreement with SOCAR

21 Interfax, *Azerbaijan, China Gezhouba Group sign memorandum on renewable power projects totaling 2 GW*, June 2, 2023, Available at: https://interfax.com/newsroom/top-stories/91115/ (Accessed: June 20, 2024).

22 Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan, "230 MW Garadagh Solar Power Plant", Available at: https://area.gov.az/en/page/layiheler/cari-layiheler/230-mvt-gunes-elektrik-stansiyasi (Accessed: May 8, 2024).

23 Masdar, *Masdar signs 1GW Clean Energy Agreement in Azerbaijan following Presidential Inauguration of Garadagh Solar Park, Largest in the Region*, October 26, 2023, Available at: https://masdar.ae/en/news/newsroom/masdar-signs-1gw-clean-energy-agreement-in-azerbaijan (Accessed: May 15, 2024).

for collaboration and exploration in the fields of renewable energy and green hydrogen.[24]

During the official visit of the President of the UAE and ruler of Abu Dhabi, Sheikh Mohamed bin Zayed Al Nahyan, to Azerbaijan on January 8–9, 2024, energy cooperation further intensified as the two countries signed important documents. The strategic cooperation document covers cooperation and investment opportunities in new areas such as rooftop solar projects, green hydrogen, green ammonia, synthetic methane, sustainable aviation fuel production, and export of green energy, along with projects for 2 GW of solar, 2 GW of onshore wind, and 6 GW of offshore wind energy. The Calendar of Actions, a road map for the construction of 1 GW of solar and onshore wind projects in Azerbaijan, documents the implementation measures for two solar and one wind energy projects in the period 2024-2027.[25]

Moreover, during Baku Energy Week, which was held on June 4–6, 2024, Azerbaijan signed an agreement with Masdar to construct two solar power plants in Bilasuvar (445 MW) and Neftchala (315 MW) districts, as well as a wind power plant in Garadagh, Absheron, with a capacity of 240 MW. The total investment in these projects is estimated to be around $1 billion. The plants are expected to save around 496 million cubic meters of natural gas per year and preventing more than 943 thousand tonnes of carbon dioxide emissions.[26]

Green energy projects will indeed support Azerbaijan's goal of increasing the share of electricity in its installed capacity. As noted by Azerbaijan's President Ilham Aliyev during the International Forum "COP29 and Green Vision for Azerbaijan", "*This year, we will see the ground-breaking ceremony for four more solar and wind power plants with a total capacity of 1,300 megawatts. Only in Garabagh and Eastern Zangezur, the capacity of the hydropower stations has reached*

24 Wood, J., "ACWA Power and Masdar in 500MW Azerbaijan cooperation deal", *WindPower Monthly*, November 23, 2023, Available at: https://www.windpowermonthly.com/article/1848673/acwa-power-masdar-500mw-azerbaijan-cooperation-deal (Accessed: May 3, 2024).

25 Hajiyev, Sh., "Azerbaijan And The United Arab Emirates Are Fostering Bilateral Ties", *Eurasia Review*, January 16, 2024, Available at: https://www.eurasiareview.com/16012024-azerbaijan-and-the-united-arab-emirates-are-fostering-bilateral-ties-oped/ (Accessed: May 3, 2024).

26 Euronews, *Azerbaijan and UAE launch joint renewable energy project as COP29 preparations underway*, June 5, 2024, Available at: https://www.euronews.com/2024/06/05/azerbaijan-and-uae-launch-joint-renewable-energy-project-as-cop29-preparations-underway (Accessed: 20 June 2024).

close to 170 megawatts in the last three years."[27] So far, Azerbaijan's energy transition has been driven by several factors, such as the growing economy, increasing energy demand, increasing energy exports, and the target to reduce GHG emissions. All the above-mentioned projects show Azerbaijan's ambitious commitments to reduce GHG emissions and increase the share of renewables in its energy mix.

Accelerating the use of renewable energy has become a key element of Azerbaijan's energy and foreign policy in recent years. Along with the development of various green energy projects across the country, Azerbaijan also supports inter-regional green energy projects.

The Green Energy Corridor

Accelerating the use of renewable energy has become a key element of Azerbaijan's energy and foreign policy in recent years. Along with the development of various green energy projects across the country, Azerbaijan also supports inter-regional green energy projects. Towards this end, Azerbaijan, Georgia, Romania, and Hungary signed an agreement to support the underwater Black Sea electric cable project to supply electricity from the South Caucasus to Europe. An investment decision is expected in late 2024 at the earliest.[28] This green energy project will connect the South Caucasus with Southeastern Europe, connecting the electricity systems of these countries and continental Europe. This project will serve as a 'Green Energy Corridor', which could become a new power source for the EU as Europe seeks to reduce its reliance on Russian energy resources, as well as being able to ensure a green energy supply from Central Asian countries to Europe in the future.[29]

The Black Sea submarine cable project opens new opportunities for Central Asian countries to tap vast green energy resources and, later, export electricity to Europe via Azerbaijan. To this end, Azerbaijan is one of the important countries of the Middle Corridor that supports strategic connectivity and energy projects and the transit of energy

27 President.az, *Ilham Aliyev attended the International Forum "COP29 and Green Vision for Azerbaijan*, April 23, 2024, Available at: https://president.az/en/articles/view/65580 (Accessed: May 14, 2024).

28 World bank, "Enhancing Energy Security through Power Interconnection and Renewable Energy Program", May 22, 2023, Available at: https://documents1.worldbank.org/curated/en/099052223113527405/text/P179950073482501009 5dc03b757832c29e.txt (Accessed: June 20, 2024).

29 Hajiyev, Sh., "Navigating the climate challenges for COP29", *NEGlobal*, May 9, 2024, Available at: https://www.neglobal.eu/cop29-and-navigating-climate-challenges/ (accessed: 15 May 2024).

sources from Central Asia to global energy markets.

Fossil fuels and renewable energy resources in Central Asia and the South Caucasus are so abundant that they can easily meet the growing energy demand of European countries in the medium and long term. These resources can also contribute to achieving the target of 42.5 percent (by 2030) renewable energy in Europe.[30] In addition, Central Asian countries, especially Kazakhstan and Uzbekistan, are rich in critical minerals, which are important raw materials in the production of renewable energy technologies.

Central Asia is becoming a strategically vital region for many external powers. The West is trying to strengthen its position there and reduce China's influence in the region. This further increases the competitiveness of the region, creates a favourable environment for investment, and makes the South Caucasus a key segment in Asia–Europe energy and trade flows.

On May 1, 2024, Azerbaijan, Uzbekistan, and Kazakhstan signed a Memorandum of Cooperation to connect the energy systems of the three countries. According to Mikayil Jabbarov, Minister of the Economy of Azerbaijan, "The implementation of this document will allow the three parties to interact in the production of 'green' energy and the organization of its export through Azerbaijan to Europe, to ensure the integration of energy systems and the efficient use of renewable energy sources."[31] To this end, Uzbekistan sets goals for renewable energy aiming 27GW capacity and 40% electricity production by 2030.[32] Kazakhstan has set a renewable energy target of at least 15% of all electricity generated to be provided by renewable energy sources by 2030, and at least 50% by 2050.[33] All the abovementioned shows that Central Asian countries aim to diversify the economy and energy mix. The energy cooperation

30 Hajiyev, Sh., & Mukhigulishvili, G., "Azerbaijan-Georgia Partnership as a Key for EU's Long-term Energy Security", *Warsaw Institute*, September 13, 2023, Available at: https://warsawinstitute.org/azerbaijan-georgia-partnership-as-a-key-for-eus-long-term-energy-security/ (Accessed: May 8, 2024).

31 Trend News Agency, *Azerbaijan signs cooperation memo to integrate Kazakhstan and Uzbekistan's energy networks,* May 1, 2024, Available at: https://en.trend.az/business/green-economy/3893516.html (Accessed: May 16, 2024).

32 Daryo, *Uzbekistan sets goals for renewable energy aiming 27GW capacity and 40% electricity production by 2030*, January 19, 2024, Available at: https://daryo.uz/en/2024/01/19/uzbekistan-sets-goals-for-renewable-energy-aiming-27gw-capacity-and-40-electricity-production-by-2030 (Accessed: July 3, 2024).

33 Ccacoalition, "Kazakhstan joined the CCAC in 2023", Available at: https://www.ccacoalition.org/partners/kazakhstan (Accessed: July 3, 2024).

between Azerbaijan, Kazakhstan, and Uzbekistan will further support the Caspian's strategic importance.

2024 UN Climate Change Conference (UNFCCC COP29) in Azerbaijan

The 29th annual United Nations (UN) climate meeting, where governments discuss important climate change issues, will take place in Azerbaijan, a first for the region. Even though the country is rich in fossil fuels and its energy mix is heavily reliant on oil and natural gas, Azerbaijan supports a sustainable energy future and a green economy.

A Presidential order declared 2024 'Green World Solidarity Year' in Azerbaijan, an important step to demonstrate Azerbaijan's commitment to environmental protection and climate action. Azerbaijan's role as a reliable energy partner and a responsible member of the international community in the fight against global warming has been recognized by many countries. At COP28 in Dubai, the parties agreed on the "loss and damage" fund and setting a "new collective quantified goal on climate finance" in 2024, taking into account the needs and priorities of developing countries.[34] At COP29 in Baku, negotiations for a new climate finance goal will dominate the agenda. Wealthy countries will need to fulfil their responsibilities by playing a role in providing climate-vulnerable countries with a level of support sufficient to transition to a low-emission and climate-resilient future.[35]

The COP29 summit is a much bigger event than any other events hitherto hosted in the country. President Ilham Aliyev signed a decree on the establishment of the Organizational Committee for the successful planning and organization of this important event.[36] COP29 in Baku will be an important platform to support international cooperation to act on climate change, implement the Paris commitments, and focus on long-term goals. Hosting COP29 for the first time in the region creates an enormous opportunity for the South Caucasus and Central Asian

34 United Nations Climate Change, "COP28 Agreement Signals "Beginning of the End" of the Fossil Fuel Era", December 13, 2023, Available at: https://unfccc.int/news/cop28-agreement-signals-beginning-of-the-end-of-the-fossil-fuel-era (Accessed: May 16, 2024).

35 World Resources Institute, *What Climate-vulnerable Countries Need on the Road to COP29*, May 16, 2024, Available at: https://www.wri.org/insights/vulnerable-countries-cop29-climate-action (Accessed: June 20, 2024).

36 Azernews, *Azerbaijan sets up Organizational Committee for COP29 – decree*, January 13, 2024, Available at: https://www.azernews.az/nation/220291.html (Accessed: June 20, 2024).

The organization of COP29 in Baku is also a success of Azerbaijan's multi-vectored foreign policy. After the Second Garabagh War, amidst the ongoing crisis in global affairs, Azerbaijan was able to win backing from Eastern European nations, including Armenia, to host COP29 in Baku.

countries to promote sustainable development and accelerate green transition.

According to Huseyn Huseynov, Head of the Sustainable Development and Social Policy Department at the Ministry of Economy of the Republic of Azerbaijan, "*Azerbaijan is going to propose creation of a new North-South Financial Mechanism at COP29. The North-South Financial Mechanism's role will serve as a bridge between National Oil (Energy) Companies and International Oil (Energy) Companies, showcasing collaborative efforts for global benefit.*"[37]

Azerbaijan may also integrate important topics such as the environmental threats of war and landmine threats into COP29's agenda, as the country is suffering from environmental degradation and the contamination of its territories with landmines sown by Armenia during the latter's occupation of the country's territories. Along with climate change, Azerbaijan supports the peace agenda in the region and, as emphasized by Hikmet Hajiyev, foreign policy adviser to the president, "*Azerbaijan continues and will exert additional efforts to make COP yet another success story with regard to peace, and to make COP29 a COP of peace alongside the climate action issue.*"[38]

The organization of COP29 in Baku is also a success of Azerbaijan's multi-vectored foreign policy. After the Second Garabagh War, amidst the ongoing crisis in global affairs, Azerbaijan was able to win backing from Eastern European nations, including Armenia, to host COP29 in Baku.

Azerbaijan's engagement in this important international event epitomizes the country's leveraging of national capacities and resources through strategic investments in renewable energy projects, supporting reforestation initiatives, and the country's sustainable development policies. From an economic standpoint, COP29 will support various sectors of the economy, especially the tourism and hospitality industries,

37 Zeynalova, L., "Azerbaijan to propose creation of new North-South Financial Mechanism at COP29", *Trend News Agency*, April 29, 2024, Available at: https://en.trend.az/business/3892103.html (Accessed: May 12, 2024).

38 Harvey, F., "Cop29 summit to call for peace between warring states, says host Azerbaijan", *The Guardian*, May 5, 2024, Available at: https://www.theguardian.com/environment/article/2024/may/05/cop29-summit-to-call-for-peace-between-warring-states-says-host-azerbaijan (Accessed: May 9, 2024).

as thousands of delegates and guests, the public and private sectors, media, and youth, as well as NGOs, will attend the climate summit. In turn, COP29 preparations support green infrastructure development across the country. Last but not least, hosting COP29 also supports Azerbaijan's environmental policy objectives and green technology innovations.

Conclusion

Azerbaijan's green growth strategy and green energy projects aim to transform the country into a 'green energy hub' in the region, ready to supply renewable energy sources from the South Caucasus and Central Asia to Europe. Azerbaijan has huge potential to develop renewable energy sources, and cooperation between Azerbaijan and its partners can support broader Black Sea–Caspian Sea energy cooperation, which is crucial for Europe's long-term energy security. By implementing critical energy infrastructure projects, Azerbaijan is working towards becoming a 'bridge state' between Europe and Central Asia, where there are fossil fuels, renewable energy resources, and essential minerals that are crucial for energy security and economic development.

The Presidential Order to declare 2024 the 'Green World Solidarity Year' in Azerbaijan is an important measure to demonstrate Azerbaijan's commitment to environmental protection and climate action. COP29 will be one of the largest and most important international events in 2024, and as insufficient progress has been seen in reducing global greenhouse gas emissions, with progress too slow across all areas of climate action, the Baku COP29 will be an important platform to support international cooperation on these areas and, ultimately, to focus on financial issues. In order to successfully host the UN climate summit, Azerbaijan mobilized its diplomatic power. Azerbaijan (COP29), together with UAE (COP28) and Brazil (COP30), launched 'The COP Presidencies Troika' to improve cooperation and continuity between current and future COP Presidencies, leading to increased climate action in support of 'Mission 1.5°C'.[39]

Moreover, fluctuations and instability in the global energy market

39 COP28.com, *COP28 launches 'The COP Presidencies Troika' in partnership with the COP29 and COP30 Presidencies-a groundbreaking initiative to support 'Mission 1.5°C' by maintaining momentum, locking in continuity, and anchoring implementation*, Available at: https://www.cop28.com/en/news/2024/02/COP28-launches-The-COP-Presidencies-Troika (Accessed: May 16, 2024).

have demonstrated the importance of a cleaner and more secure energy future. Conflicts cause environmental degradation and landmine contamination, which are serious threats to sustainable development. The environmental impact of war is a serious challenge, as war fuels greenhouse gas emissions, pollution, soil degradation, biodiversity loss, and ecosystem destruction. In addition, the post-conflict clearance of landmines and explosive remnants of war leads to further soil degradation and localized pollution. Considering all these factors, COP29 in Baku will provide the right momentum for parties to discuss the environmental impacts of conflicts and how to prevent further environmental degradation.

Finally, despite all the environmental and other challenges posed by the former Armenia–Azerbaijan war, Azerbaijan supports sustainable development and the green transition. Azerbaijan's green energy strategy targets the diversification of energy resources and supplies, as well as increasing the share of renewable energy in its energy mix. This will help the country to save natural gas in power generation and, simultaneously, increase the export of gas and electricity to European energy markets. This strategy will also help the country to meet its Paris Agreement CO_2 mitigation pledges.

Landmine legacy in Azerbaijan: A threat to reconstruction and sustainable development

Maurizio Geri*, Leyla Gasimova**, Aydan Huseynova***, Luisa Canciello****

The three-decade-long Armenia-Azerbaijan conflict came to an end in 2023, but it left behind a hidden menace – the existence of landmines, particularly in the liberated territories of Azerbaijan. These deadly remnants of war pose a significant threat to human rights, notably the right of internally displaced persons (IDPs) to return to their homes and properties, but also rights to sustainable development and environmental protection, as well as to peace and stability throughout the entire South Caucasus region. This article aims to shed light on the impact of landmines and the importance of addressing this issue promptly. Furthermore, it emphasizes the strategic significance of rapid demining for post-conflict reconstruction in the South Caucasus and underscores the need for concerted efforts to ensure development, environmental protection, and stability in the region.

Keywords: Azerbaijan, environment, South Caucasus, landmines, reconstruction, sustainable development

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Introduction

The South Caucasus region, situated between the Black Sea and the Caspian Sea, has long been a vital geopolitical crossroads facilitating trade routes across the Eurasian continent. Following the dissolution of the Soviet Union, the Caucasus region underwent a pivotal change. Northern areas remained part of Russia while Armenia, Azerbaijan, and Georgia in the Southern part gained their independence. This marked the South Caucasus as a distinct sub-region, recognized by major international players for its geo-economic and geopolitical importance, including in serving as a vital transit hub offering connectivity from the Caspian Sea to Europe.[1]

Yet, the protracted conflicts in the South Caucasus prevented this region from fully exploiting its transit and economic potential. Notably, the three-decades-long occupation of Azerbaijani territories by Armenia, including the massive contamination of these territories with landmines and other explosive remnants of the war including unexploded ordnance and improvised explosive devices, turned those territories into a grey zone, the liveliness and economic potential of which was obliviated. In the post-conflict period, when Azerbaijan is engaged in massive development and reconstruction works with a determination to bring a new life to those territories liberated from the occupation, the existence of landmines poses an impediment to these efforts, a severe threat to the environment, and a risk to human lives through fatalities and injuries. The mines often affect civilians engaging in construction, agriculture, and development work, as well as children and vulnerable populations. Furthermore, landmines baffle economic development by hindering and slowing post-conflict reconstruction efforts. Addressing the clearance of landmines will make it possible to create a safer environment for socioeconomic progress. It is therefore crucial to mitigate this humanitarian threat

Notably, the three-decades-long occupation of Azerbaijani territories by Armenia, including the massive contamination of these territories with landmines and other explosive remnants of the war including unexploded ordnance and improvised explosive devices, turned those territories into a grey zone, the liveliness and economic potential of which was obliviated.

1 Bekiarova, N., "South Caucasus as a Region of strategic importance", *JASOS-International E-Journal of Advances in Social Sciences,* Vol. V, Issue 14, August 2019, p.1017.

and alleviate the suffering of affected individuals and communities.[2]

This article uses secondary sources, such as academic literature, reports from national and international organizations, and news articles, to provide a short analysis of the issue and offer insights into the implications of landmines for peace, reconstruction, and sustainable development in the country. It emphasizes the importance of cooperation between the participants in the conflict and the international community.

Use of landmines in conflict areas and their impact on the environment and the development of affected areas

Despite the potential damage from the use of booby traps and landmines in military conflicts, especially to civilians, and efforts by the international community to ban the use of landmines in this context, some countries still deploy landmines to inflict as much civilian damage as possible.

The long-term effects of landmines extend far beyond the battlefield, posing significant political, economic, and social challenges for post-conflict communities. The presence of landmines can render vast swathes of agricultural land unusable, hindering potential food production and exacerbating existing economic hardships.

The strategic use of landmines in warfare significantly contributes to their enduring presence. Military doctrine views minefields as a cost-effective defence tactic, employed to disrupt enemy offensives, impede troop movement, and protect critical territory.[3] Such minefields utilize both anti-tank and anti-personnel mines, designed to cripple the opposing side's vehicles and inflict casualties on their soldiers. This defensive strategy could, ideally, be implemented with minimal civilian casualties, as minefields can be laid in advance and meticulously mapped. However, historical evidence overwhelmingly demonstrates that this is rarely the case. The widespread deployment of landmines throughout history, evident from World War II through to contemporary conflicts, is a key factor in the global challenge of landmine contamination.

The long-term effects of landmines extend far beyond the battlefield, posing significant political, economic, and social challenges for post-conflict communities. The presence of landmines can render

2 Bent, C. and Safikhanov, H., "Azerbaijan's Landmine Victims: Realities and Challenges", *Journal of Mine Action,* Vol. 12: Iss. 1, Article 11, 2008.

3 Joint Publication 3-15, "Barriers, obstacles, and mine warfare for Joint Operations", *Joint Force Development, Joint Chief of Staff,* USA, September 6, 2016.

vast swathes of agricultural land unusable, hindering potential food production and exacerbating existing economic hardships. This, in turn, disrupts the reconstruction process and delays the return of displaced populations to their homes in the post-conflict period.

Land degradation caused by mine explosions further impedes agricultural revival by disrupting soil composition and micro-relief, hindering vital sectors such as agriculture.[4] According to some scholars, "denial of access is one of the most serious problems associated with the use of landmines, as it prohibits the access of vital resources for the support of life (e.g. water)".[5] Accordingly, it might be part of a strategy to include landmines to inflict future damage to the affected territories. In fact, the "simple presence of a single mine can discourage the development of agricultural work or the flow of water or food supplies that are strictly necessary."[6]

The presence of landmines hinders the reconstruction of essential services such as schools and hospitals, delaying the return to normality and exacerbating hardships for communities. Furthermore, landmine explosions can cause significant environmental damage, leading to biodiversity loss and chemical contamination.[7] These long-term consequences highlight the strategic intent behind landmine use – inflicting not only immediate military damage (e.g. disabling tanks), but also causing long-term societal and environmental disruption.

The case of Azerbaijan: Background and context

The [former] Armenia-Azerbaijan conflict originated from the former's territorial claims against the latter. Dating back to around 1988, these intensified after the dissolution of the Soviet Union (when Azerbaijan and Armenia became independent states) and culminated in the First Karabakh War, during which Armenia occupied roughly 20% of

4 Frost, A., "Mitigating the Environmental Impacts of Explosive Ordnance and Land Release", *Mine Action Review*, JMU Scholarly Commons, Global CWD Repository, 2021

5 Berhe A.A., "The contribution of landmines to land degradation", *Land Degradation & Development*, Volume18, Issue1 January-February: pp.1–15, 2007.

6 *Ibid.*

7 Njeri S., "Mine Action and the Environment. The 'Triple vulnerability' - Climate, Conflict and Contamination; the humanitarian implications of intersecting climate, conflict risk and contamination from mines and UXOs2", *paper presented at the 23rd International Meeting of Mine Action National Directors and UN Advisers (NDM-UN23),* Geneve, 2020.

Azerbaijan's internationally recognized territory.[8] As a consequence, about 700,000 Azerbaijanis were forcibly displaced from the then-occupied territories.[9] Despite efforts by international organizations and major powers to resolve the conflict over many years, progress remained elusive until the outbreak of the Second Karabakh War in 2020, which ended after 44 days with the Trilateral Statement of November 10, 2020.[10] In September 2023, Azerbaijan conducted anti-terror measures in the Karabakh region to disarm illegal Armenian armed formations. These ended with the dissolution of the separatist regime previously established in, and supported by, Armenia in the region.[11] In the aftermath of both the 44-day war in 2020 and the September anti-terror operations in 2023, Azerbaijan embarked on large-scale demining activities to clear the region which was filled with landmines left behind by Armenia's armed forces.[12]

Following the 1994 ceasefire that ended the First Karabakh War, a 900-kilometer line of contact separating the occupied territories from Azerbaijan proper was filled with anti-personnel and anti-tank mines.

Landmines and the UXO issue

Azerbaijan faces a significant challenge, as there are an estimated one million landmines and items of unexploded ordnance (UXO) present in the region.[13] According to Azerbaijani President Ilham Aliyev, clearing all the landmines in the region would require 30 years and $25 billion.[14] Among other things, the lack of complete mine maps is hindering the ongoing reconstruction and rehabilitation work in

8 President.az, "Armenia-Azerbaijan conflict", Official website of President of the Republic of Azerbaijan, Available at: https://president.az/en/pages/view/azerbaijan/karabakh (Accessed: June 13, 2024).

9 Isayev, T., "Return of Azerbaijani immigrants to their lands according to the ceasefire agreement signed after the Second Nagorno-Karabakh war", *Inonu University Law Review,* 14(1), 2024, p. 153-165.

10 President.az, "Armenia-Azerbaijan conflict", *op.cit.*

11 *Ibid.*

12 Torelli C., Landmines in Azerbaijan continue to pose a lethal threat to peace and development, *Action on Armed Violence,* June 22, 2023, Available at: https://aoav.org.uk/2023/landmines-in-azerbaijan-continue-to-pose-a-lethal-threat-to-peace-and-development/ (Accessed: June 13, 2024).

13 Shiriyev Z., "Defusing Azerbaijan's Landmine Challenge", *International Crisis Group*, Commentary / Europe & Central Asia, May 31, 2023, Available at: https://www.crisisgroup.org/europe-central-asia/caucasus/azerbaijan/defusing-azerbaijans-landmine-challenge (Accessed: April 12, 2024).

14 Eurasianet, *The mammoth task of demining Azerbaijan*, September 11, 2023, Available at: https://eurasianet.org/the-mammoth-task-of-demining-azerbaijan (Accessed: April 12, 2024).

the liberated territories and preventing the safe and early return of approximately 700,000 displaced Azerbaijani citizens. It is impeding their ability to rebuild homes, cultivate land, and freely travel within their territory.

Following the 1994 ceasefire that ended the First Karabakh War, a 900-kilometer line of contact separating the occupied territories from Azerbaijan proper was filled with anti-personnel and anti-tank mines. In the aftermath of the 1994 cease-fire accord, Azerbaijani military engineers started mine clearance operations, especially in the Fizuli and Agdam districts, removing almost 19,000 anti-tank and 22,000 anti-personnel mines.[15] Most of the minefields were situated along the Armenian border with Azerbaijan and across the former line of contact, as well as in areas around and in front of fortifications and outposts installed by Armenia's armed forces during the occupation period. Armenia recognized that numerous parties had used mines in the border area and adjacent territories without recording or marking the mined areas during the 19881994 conflict.[16] According to a landmine impact survey (LIS) conducted by the Survey Action Center (SAC) and the International Eurasia Press Fund (IEPF) in 2003, 18 out of the 65 districts in Azerbaijan were found to be contaminated by landmines and UXO,[17] the majority in the Fuzuli and Aghstafa districts. However, the survey did not cover the (at that time) occupied territories of Azerbaijan, Azerbaijan's Nakhchivan Autonomous Republic, or certain other areas where the military restricted access.

After 20 years of occupation, the contamination increased exponentially. Furthermore, contrary to the Trilateral Statement signed on November 10, 2020, Armenia, in the presence of Russian peacekeepers, seems to have continued mine deployment activities in the border districts and the Karabakh region of Azerbaijan.[18] Those activities perpetrated by

15 Human Rights Watch Reports, together with International Campaign to ban landmines and Landmine Monitor, "Europe/Central Asia Non-Signatories", 1999, available at: https://www.hrw.org/reports/1999/landmine/WEBEUR3.html (Accessed: May 6, 2024).

16 Berikashvili, N. "The role of the OSCE mission in the South Caucasus regarding weapon and landmine issue", *Helsinki Monitor,* 16(2), 2005, p.132-142

17 Cluster Munition Monitor, "Azerbaijan", 2005, available at: http://archives.the-monitor.org/index.php/publications/display?url=lm/2005/azerbaijan.html (Accessed: April 12, 2024).

18 Galvin G., "Azerbaijan demands UN action as Nagorno-Karabakh landmine row escalates", Eurasianet, December 12, 2022, Available at: https://eurasianet.org/azerbaijan-demands-un-action-as-nagorno-karabakh-landmine-row-escalates (Accessed: May 6, 2024).

Azerbaijan's neighbouring country subsequently created challenges for achieving peace and stability and building trust in the region, as they restricted people's freedom of movement and impeded the safe return of internally displaced persons (IDPs) to their homelands. According to a report by Azerbaijan's National Agency for Mine Action (ANAMA), between the liberation of the territories in 2020 after the end of the conflict and March 2023, ANAMA and its partners cleared an area of 746 km^2 of mines and ERW (Explosive Remnants of War, consisting of UXO and abandoned explosive ordnance (AXO)) – 9% of the total contaminated area.[19] This is why, in 2023, ANAMA reported that it would prioritize surveying suspected mined areas to gain a better understanding of the extent of the contamination.[20]

Challenges and implications of landmines in the UN SDG framework

The presence of landmines, besides posing a threat to the lives of hundreds of thousands of citizens expected to resettle in the liberated areas, hinders efforts towards post-conflict reconstruction and sustainable development. Notably, the contamination impedes the achievement of the UN Sustainable Development Goals (SDGs) as part of the 2030 Agenda for Sustainable Development adopted by the UN in 2015. The 17 SDGs form an urgent call for action by all countries – developed and developing – in a global partnership that recognizes that ending poverty and other deprivations must go hand-in-hand with strategies to improve health and education, reduce inequality, and spur economic growth. As some reports recognize,[21] one of the most important limits to realizing this ambitious vision lies in post-conflict areas, where conflict has ravaged communities and left behind the dangers of mines, cluster munitions, and other remnants of warfare. Other studies show how mine clearance engages with the SDGs and helps movement

19 Mine Action Review, "Clearing the mines 2023 – Azerbaijan", Available at: https://www.mineactionreview.org/assets/downloads/Azerbaijan_Clearing_the_Mines_2023.pdf (Accessed: May 6, 2024)

20 International Campaign to Ban Landmines, "Landmine Monitor 2023", 2023, p.50, Available at: https://backend.icblcmc.org/assets/reports/Landmine-Monitors/LMM2023/Downloads/Landmine-Monitor-2023_web.pdf (Accessed: May 6, 2024)

21 Hofmann U., (GICHD) and Juergensen O. (UNDP), "Leaving no one behind: mine action and the sustainable development goals", *Geneva International center for Humanitarian* Demining, GICHD-UNDP, June 2017, Available at: https://www.gichd.org/fileadmin/uploads/gichd/Publications/Leaving_no_one_behind-Mine_Action_and_SDGs.pdf (Accessed: May 6, 2024).

There are several reasons why it is challenging to achieve the SDGs in Azerbaijani territories affected by mines. The first is the humanitarian impact, as landmines cause casualties and injuries, particularly among civilians.

towards improvements in agricultural production, trade and access to markets, and social and physical infrastructure.[22]

There are several reasons why it is challenging to achieve the SDGs in Azerbaijani territories affected by mines. The first is the humanitarian impact, as landmines cause casualties and injuries, particularly among civilians. According to statistics received from ANAMA,[23] between 1991 and July 1, 2024, 3,448 Azerbaijani people lost their lives because of landmines planted by Armenia. Since the end of the Second Karabakh War in 2020, 69 Azerbaijanis have been killed and 300 people have received injuries due to landmine explosions (as of July 1, 2024).[24] Among the 69 victims killed, only 15 were soldiers and the remaining 54 were civilians.[25] This creates a direct barrier to achieving SDG 3: Good Health and Well-being, as well as impacting other goals related to reducing inequalities (SDG 10); promoting peace, justice, and strong institutions (SDG 16); and fostering partnerships for the goals (SDG 17).

Landmines not only harm individuals and societies, they also have long-term effects on the environment, such as contaminating land and water sources. According to preliminary data, there are 147,988 hectares of highly contaminated land, and a further 675,570 hectares are considered to have medium and low mine pollution.[26] Explosive remnants and improvised explosive devices made from landmines have

22 Ikpe E., and Njeri, S., "Mine clearance, peacebuilding and development: interactions between sustainable development goals and infrastructure in Angola", Peacebuilding Journal, April 22, 2024, Available at: https://www.tandfonline.com/doi/full/10.1080/21647259.2024.2335427 (Accessed: May 6, 2024).

23 Trend News Agency, *Azerbaijani ANAMA discloses number of mine victims*, April 4, 2024, Available at: https://en.trend.az/azerbaijan/society/3881623.html (Accessed: April 12, 2024); Data from: ANAMA's Quarterly Report "Mine Action in Azerbaijan: Priorities and Needs", January 2023.

24 Torelli, *op.cit*.

25 Data from official website of Azerbaijan National Mine Agency (ANAMA), Available at: https://anama.gov.az/en/enlightenment-works (Accessed: April 19, 2024).

26 Watson N., "Azerbaijan Faces Huge De-Mining Challenge with Little Help from the West", *NJ.Com,* March 20, 2024, Available at: https://www.nj.com/opinion/2024/03/azerbaijan-faces-huge-de-mining-challenge-with-little-help-from-the-west.html (Accessed: April 12, 2024); Data from: Mine Action Review, "Clearing The Mine 2023 - Azerbaijan", 2023, https://www.mineactionreview.org/assets/downloads/Azerbaijan_Clearing_the_Mines_2023.pdf

also been found in water basins and on trees. This consequently affects progress towards SDGs related to life on land (SDG 15) and clean water and sanitation (SDG 6). Moreover, landmines inhibit agricultural activities, infrastructure development, and economic growth in affected areas. This creates barriers to achieving SDGs related to decent work and economic growth (SDG 8); industry, innovation, and infrastructure (SDG 9); as well as sustainable cities and communities (SDG 11). The presence of landmines poses a significant challenge to Azerbaijan's efforts to promote agricultural sustainability and renewable energy as a means of diversifying to a non-oil economy and attracting foreign investment.

Strategies for resolution

The presence of the landmines in the liberated territories of Azerbaijan is a "passive battle" that constitutes a silent yet devastating form of conflict that will continue to inflict harm long after active hostilities ceased. Therefore, the pursuit of stability and peace in the region requires international support and collaboration to deal with this issue.

The presence of the landmines in the liberated territories of Azerbaijan is a "passive battle" that constitutes a silent yet devastating form of conflict that will continue to inflict harm long after active hostilities ceased.

The government of Azerbaijan considers humanitarian mine action a national priority. From 2020 to April 2023, nearly 7% per cent of contaminated land has been cleared, including high, medium, and low-threat areas.[27] However, the scope of the issue is massive, and the availability of resources is limited. This highlights the importance of engaging international partners along with national agencies to achieve visible progress and conducting feasibility studies and surveys to accelerate mine clearance.

The exchange of landmine maps is a crucial factor in accelerating post-conflict rehabilitation and reconstruction work. Ben Keith, a lawyer working on issues of post-conflict human rights, believes that "the exchange of land mine maps should take greater importance in post-conflict related discussions" and that "they should be part of any truce; otherwise, conflicts will continue to kill long after military combat has ended."[28]

27 Shiriyev, *op.cit.*

28 Hammond J., "From Ukraine To Yemen, Land Mines Can Devastate Investors Too", *Forbes/Zenger News,* April 4, 2024. Available at: https://www.forbes.com/sites/

Armenia should not shy away from its responsibilities but should assist Azerbaijan in the latter's efforts to demine the liberated areas.

While Armenia provided some maps to Azerbaijan, concerns regarding their accuracy persist.[29] Armenia should not shy away from its responsibilities but should assist Azerbaijan in the latter's efforts to demine the liberated areas. This might also serve as a perfect confidence-building step between the two countries. Such a gesture would also have genuine humanitarian value – the demining of the contaminated territories will pave the way for the safe development of cross-border infrastructure projects and trade relations with Azerbaijan. Such economic interdependence of the two countries, established naturally, could contribute to the consolidation of stability and an environment of peace in the region. In the future, this could develop into regional economic and political integration, with the additional participation of Georgia.

It has also been argued that Azerbaijan's accession to the 'Ottawa Convention' (the Convention on the Prohibition of the Use, Stockpiling, Production and Transfer of Anti-Personnel Mines and on Their Destruction) could significantly enhance its prospects for international support and create a conducive atmosphere for donor engagement in Azerbaijan. However, the convention focuses specifically on the prohibition of anti-personnel mines. Its scope does not include anti-tank mines, command-action mines or cluster mines, cluster munitions, or improvised explosive devices, which Azerbaijan's liberated territories also contain.

Moreover, geopolitical dynamics complicate Azerbaijan's potential accession to the Ottawa Convention. Even key global powers are absent from the convention. Daryl Kimball of the Arms Control Association highlights that major producers and users of landmines, including the United States, China, and Russia, have not signed the Convention, and neither has Armenia.[30] This raises questions about the efficacy and universality of the convention in comprehensively addressing the issue of landmines.

Nevertheless, even without being signatories to the Ottawa Convention,

zengernews/2024/04/04/on-world-landmine-day-a-new-shift-in-strategy-toward-mine-victims-is-forming/?sh=599e07b86dba (Accessed: April 12, 2024)

29 Torelli, *op.cit*.

30 Kimball D., "Fact Sheet", Arms Control Association, 2022, Available at: https://www.armscontrol.org/factsheets/ottawasigs (Accessed: April 12, 2024).

affected countries should receive the necessary support. For instance, the UNGA's biennial resolution on "Assistance in Mine Action" does not distinguish between Ottawa Convention signatory or non-signatory states when urging the provision of necessary assistance to mine-affected states. Rather, assisting mine-contaminated countries is an act of humanitarian significance. Albeit Azerbaijan was able to mobilize some funding for and technical assistance to its national mine action, the extent of the contaminated territories nevertheless necessitates further financial and technical support.

Indeed, financial support from external donors is a very important element in addition to maps and an international institutional framework. The reconstruction effort is already very costly, but demining increases that cost. The problem is that mine clearance is often not a priority for donors. Some scholars argue that an innovative solution to mitigate the impact of landmines could involve the establishment of a new UN fund modelled after the successful UN Voluntary Fund for Victims of Torture, which has supported over 50,000 individuals with various forms of aid.[31]

Nevertheless, the US State Department has funded the training of a demining team[32] and the UNDP has contributed to some projects. Although the UNDP is the main external actor managing mine action in Azerbaijan, the EU is considered one of the most important donors providing assistance for mine action in the country. In fact, the EU, with a financial contribution of €4.25 million,[33] is the largest international donor. It is equipped with the necessary tools to cover all key aspects of mine clearance, risk education, victim assistance, stockpile destruction, capacity building, mine detection, and mine clearance technology research and development.[34] Therefore, in May 2024, the EU launched the "Team Europe Initiative on Mine Action" in Azerbaijan to strengthen

31 Hammond J., *op.cit.*

32 US Embassy in Azerbaijan, "Training for state department funded demining teams kicks off", June 16, 2023. Available at: https://az.usembassy.gov/anama-terter/#:~:text=To%20promote%20regional%20peace%20and,four%2014%2Dperson%20demining%20teams%2C (Accessed on May 6, 2024)

33 UNDP Azerbaijan, "European Union funded project for mine action kicks off in Azerbaijan", February 8, 2023, Available at: https://www.undp.org/azerbaijan/press-releases/european-union-funded-project-mine-action-kicks-azerbaijan (Accessed on May 6, 2024)

34 Council of the EU, "Ottawa Convention: Council addresses the threat of mines and explosive remnants of war", Press release, February 19, 2021, Available at: https://www.consilium.europa.eu/en/press/press-releases/2021/02/19/ottawa-convention-council-addresses-the-threat-of-mines-and-explosive-remnants-of-war/ (Accessed on April 12, 2024).

Landmine issues are so complex that they emphasize the importance of cooperation among donor countries, diplomatic missions, academic experts, scientists, activists, and non-governmental organizations (NGOs).

ANAMA's work, raise mine awareness, and support victims. As the EU delegation to Azerbaijan said: "Clearing explosive hazards will facilitate the safe return of internally displaced persons and promote sustainable communities."[35]

Furthermore, in 2023, ANAMA, UNDP, and the EU launched a project funded by the EU Commission to address contamination by mines and unexploded ordnance. This included establishing two all-female demining teams in Azerbaijan, thus also helping to increase the role women play in mine action.[36]

Apart from the EU, other support in clearing landmines comes from Belgium's APOPO and the UK's MAG, which launched a project with UNDP and the International Eurasia Press Fund (an Azerbaijani NGO), again with funding from EU, to mitigate the landmine threat in the country.[37]

Landmine issues are so complex that they emphasize the importance of cooperation among donor countries, diplomatic missions, academic experts, scientists, activists, and non-governmental organizations (NGOs). All play crucial roles in mobilizing resources, raising awareness, and advocating for policies that prioritize landmine clearance and victim assistance. Therefore, by communicating regarding the situation and rallying international support, Azerbaijan can enhance its operational capacity, expand its reach, and accelerate progress towards a landmine-free future.

Conclusions

In the aftermath of the new reality established in the South Caucasus, most notably with Azerbaijan reclaiming its sovereignty over its

35 EU NeighboursEast, *Team Europe launches Mine Action in Azerbaijan*, May 6, 2024, Available at: https://euneighbourseast.eu/news/latest-news/team-europe-launches-mine-action-in-azerbaijan/ (Accessed: June 13, 2024).

36 EU Commission, Service for Foreign Policy Instruments, "Transformative impacts of FPI projects: empowering women globally", March 8, 2024, Available at: https://fpi.ec.europa.eu/stories/transformative-impacts-fpi-projects-empowering-women-globally_en (Accessed April 12, 2024)

37 Apopo, "APOPO Assists Azerbaijan in Clearing Landmines in Post-Conflict Scenario", August 9, 2023, Available at: https://apopo.org/latest/apopo-assists-azerbaijan/?v=5b79c40fa7c2 (Accessed on May 6, 2024)

formerly occupied territories, a concealed peril has been unveiled: landmines. These lethal vestiges of war endanger not only basic human rights but also environmental integrity while casting a shadow over peace, stability, and development across the entire South Caucasus region. Mines continue to pose a threat to civilians and hinder post-conflict reconstruction efforts, as they create a complex web of challenges that directly impede the achievement of various SDGs in the liberated territories of Azerbaijan. Therefore, addressing landmine issues is crucial for advancing sustainable development, promoting environmental protection, and ensuring the well-being of affected populations.

Addressing the issue of landmines is not merely a matter of regional concern but a fundamental human rights imperative and a prerequisite for stability and peace. The passive nature of landmine warfare underscores the urgency of international support in mitigating its devastating impact on communities and individuals. By prioritizing human rights, promoting regional stability, and providing steadfast support to national entities such as ANAMA, the international community can collectively work towards eradicating the scourge of landmines and ensuring a safer, more secure future for all.

Peace and stability in the South Caucasus are essential for sustaining regional economic cooperation and promoting prosperity. By prioritizing diplomatic engagement, reconstruction, and economic cooperation, regional stakeholders and global powers can work together to safeguard the South Caucasus as a beacon of peace, stability, and sustainable development.

Reaching peace through responsibility: The role of international arbitration's stance on the South Caucasus' environmental post-war recovery

Valentina Chabert*

In light of multiple instances of environmental damage committed by Armenia and foreign corporations during the three decades of occupation of Azerbaijani territory, the present article aims at investigating the necessity of bolstering peace negotiations through the recognition of Armenia's legal responsibility for ecosystem harm in the territories of Azerbaijan. To this purpose, the role of international arbitration in promoting Azerbaijan's environmental post-war recovery is investigated. Specifically, the article explores the current framework of international humanitarian law providing for the protection of the environment during armed conflict, as well as the relationship between the law of occupation and natural resource exploitation. Against this background, the ultimate objective of this article lies in the investigation of Azerbaijan's requests for inter-state arbitration pursuant to the Bern Convention and the Energy Charter Treaty. This is considered to be potentially the most successful option for Azerbaijan to get compensation for environmentally harmful acts committed by Armenia. Additionally, this article considers that arbitration emerges as the best legal solution for Azerbaijan to seek redress for environmental wrongdoing, as international law is poorly equipped to tackle the issue of corporate actors' responsibility. Indeed, obtaining compensation by directly suing corporate actors that have committed environmental damage in occupied territories under Armenia's jurisdiction before national tribunals appears to be extremely complicated.

Keywords: Arbitration, Energy Charter Treaty, Bern Convention, environmental damage, South Caucasus.

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Introduction

From the outbreak of the First Karabakh War in the early 1990s until Azerbaijan's restoration of its territorial integrity in 2023, three decades of Armenian occupation resulted in multiple instances of environmental damage on the sovereign territory of Azerbaijan. Among these are landmine contamination, eco-terrorism activities, water pollution, and illegal exploitation of natural resources.[1] Harm to the natural ecosystem of Azerbaijan was also instigated by foreign companies. Specifically, evidence of the involvement of corporations with foreign and Armenian registration in the formerly occupied territories of Azerbaijan has been collected by the present author.[2]

Against this background, the intent of this article is to contribute to the post-conflict recovery discourse in Azerbaijan by advancing the idea that compensation for environmental wrongdoing committed by Armenia, and foreign corporations acting under its jurisdiction in the occupied territories, could be a first step to achieving responsibility, which in turn could be beneficial for peace with Azerbaijan. In particular, the underlying objective of this article is to outline the current attempts by Azerbaijan to seek Armenia's responsibility for environmental damage before international tribunals. Markedly, among different legal strategies, the present article considers recourse to arbitration to be potentially the most successful procedure both to receive compensation from Armenia for environmental wrongdoings and, therefore, to promote post-war environmental recovery in Azerbaijan.

For the above-mentioned reasons, the first section of the article will be dedicated to the examination of the framework of international humanitarian law dealing with the protection of the environment during armed conflicts, with a view to outlining the possible legal instruments that can be invoked in the event of serious environmental damage committed in the context of war or during an armed conflict. Along these lines, the second section will specifically cover the relationship between the law

1 Chabert, V., "Contractualization of Environmental Protection: Prospects for Post-conflict Recovery of the Formerly Occupied Territories of Azerbaijan", *Caucasus Strategic Perspectives*, Volume 4, Issue 2, 2023, Available at: https://cspjournal.az/post/contractualization-of-environmental-protection-prospects-for-post-conflict-recovery-of-the-formerly-occupied-territories-of-azerbaijan-513 (Accessed: April 27,2024).

2 Azercosmos, *Report on space monitoring of mineral deposits on the territory of the Republic of Armenia*, August 25, 2023, Available at: https://en.trend.az/azerbaijan/politics/3788658.html (Accessed: April 27,2024).

of occupation[3] and environmental protection. The results of this section are specifically relevant as the law of occupation provides rules for the protection of the environment when military hostilities have ceased. At the same time, the rules for the protection of the environment under the law of occupation differ from the regulatory framework provided by international humanitarian law, as in the latter case armed hostilities are present. Notably, this is of particular interest for the case of the formerly occupied territories of Azerbaijan, as environmental damage has been committed not only during armed conflict but also during the occupation. Finally, the third and fourth sections will extensively investigate the role of international arbitration in addressing damages to the natural ecosystem and activities detrimental to the environment committed by Armenia. More precisely, Azerbaijan's requests for inter-state arbitration pursuant to the Bern Convention and the Energy Charter Treaty will be carefully scrutinized. In the author's view, resorting to arbitration represents the most viable and potentially successful option for Azerbaijan to overcome the main difficulties of international law when it comes to corporate actors' responsibility. As a matter of fact, it should be noted here that several obstacles which are inherent to international law represent obstacles to assessing the responsibility of corporations that have been involved in environmental damage. Among these are the transnational nature of the corporation, its unclear status as a subject of international law, and the difficulties in assessing which state (either the host or the home state of a corporation operating abroad) is competent to adjudicate a case of environmental damage committed by a private entity. At the same time, seeking redress for environmental wrongdoing committed by corporations would likely be extremely complicated and potentially unsuccessful for Azerbaijan. For this reason, arbitration could ultimately emerge as the most efficient legal remedy in promoting environmental responsibility and eventually assigning compensation, thereby benefiting post-war environmental recovery in the conflict-affected territories of Azerbaijan.

Protection of the environment during armed conflicts

Before approaching the specific issue of arbitration, a brief investigation of the current framework of international humanitarian law on the protection of the environment in time of armed conflicts appears to be

3 For more information about the law of occupation Lieblich, E., Benvenisti, E., *Occupation in International Law* (Oxford University Press 2022).

necessary. In fact, a similar focus would enable understanding which norms are applicable in the case of damage to the ecosystem in a context of war.

International humanitarian law is specifically designed to deal with the conduct of warfare and the protection of certain groups of persons not participating in the hostilities. Within this framework, the protection of the environment can be configured as either direct or indirect, to the extent that the environment can be considered a civilian object.[4] In most cases, however, it has to be acknowledged that environmental damage occurring as a result of hostilities is collateral damage.

For a more in-depth examination of *ius in bello* treaty law provisions for environmental protection, article 35(3)[5] and article 55[6] of the Additional Protocol I to the Geneva Conventions of August 12, 1949, provide for direct protection of the environment in times of armed conflict. For the first time, these provisions expressly prohibited the environment being a specific military target and conceived it as being inherently valuable beyond the mere provision of benefit for human beings.[7] Article 55 imposes due diligence obligations on state parties, which are required to undertake an environmental impact assessment prior to the launch of military operations on an ongoing basis and for both offensive and defensive operations.[8] What is more, the same article compels belligerents to protect the natural environment against widespread, long-term, and severe damage in order to protect civilians. Furthermore, article 23(g) of the 1907 *Hague Regulations Respecting the Laws and Customs of War on Land* prohibits acts that "destroy or seize the enemy's property, unless such destruction or seizure be imperatively demanded by the necessities of war".[9] Despite having been

4 Sjöstedt, B., Bruch, C., Payne, C., "Armed Conflict and the Environment," in Rajamani, & J. Peel (eds.), *The Oxford Handbook of International Environmental Law* (Oxford University Press, 2021) p. 871.

5 Protocol Additional to the Geneva Conventions of 12 August 1949, and relating to the Protection of Victims of International Armed Conflicts (Protocol I), June 8, 1977, article 35(3).

6 *Ibid.,* art. 55.

7 *Ibid.*

8 Hulme, K., "Environmental protection in armed conflict", in: Fitzmaurice, Ong, Merkouris, *Research Handbook on International Environmental law* (Celtenham: Edward Elgar Publishing, 2010).

9 Hague Convention (IV) Respecting the Laws and Customs of War on Land, October 18, 1907, art. 23(g).

drafted without specific consideration of the environment, the reference to human property in article 23(g) potentially protects natural resources pertaining to the state, as in the case of oil facilities and refineries that may also become military targets of a war.[10]

In another instance, the 1925 Geneva Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or other Gases, and of Bacteriological Methods of Warfare[11] further provides a valuable framework for environmental protection during armed conflicts. Moreover, a few years after the end of the Second World War, states codified the rules and customs of warfare, specifically tackling the issue of wartime environmental protection in art. 53 and 147 of the 1949 Geneva IV Convention relative to the Protection of Civilian Persons in Time of War. Notably, the above-mentioned articles envisage the unlawful destruction and appropriation of property in the absence of military necessity as a breach of the Convention. Eventually, article 1 of the Convention on the Prohibition of Military or Any Hostile Use of Environmental Modification Techniques (ENMOD) of December 10, 1976, prohibits the contracting parties from engaging in "military or any other hostile use of environmental modification techniques having widespread, long-lasting or severe effects as the means of destruction, damage or injury to any other State party".[12]

In addition to treaty provisions, the environment is further protected in times of war by a number of customary rules of international law. The International Committee of the Red Cross confirmed that the relevant principles on the conduct of hostilities equally apply to the environment.[13] Indeed, on the basis of the fact that the environment could easily be affected by hostilities, Rule 43 of the *Study on Customary Law* affirms that no part of the natural environment can be attacked,

10 Low, L., Hodgkinson, D., "Compensation for Wartime Environmental Damage: Challenges to International Law after the Gulf War", *Virginia Journal of International Law,* 1995, pp. 405-438; See also: Schwabach, A., "Envionmental Damage Resulting from the NATO Military Action against Yugoslavia", *Columbia Journal of Environmental Law,* 2000, pp. 117-124.

11 Protocol for the Prohibition of the Use in War of Asphyxiating, Poisonous or Other Gases, and of Bacteriological Methods of Warfare, 1925.

12 United Nations, Convention on the prohibition of military or any other hostile use of environmental modification techniques, 1976, art.1.

13 International Committee of the Red Cross, Application of General Principles on the Conduct of Hostilities to the Natural Environment, rule 43, Available at: https://ihl-databases.icrc.org/en/customary-ihl/v1/rule43 (Accessed: April 27, 2024).

unless it is a military objective.[14] Therefore, the civilian nature of the environment appears to be confirmed.[15]

The protection of the environment is further enhanced by reference to the principles of military necessity and proportionality. According to the principle of necessity, to be lawful, weapons and tactics involving the use of force must be reasonably necessary to the attainment of their military objective.[16] As a result, actions intended to destroy or seize the opposing side's property that are not imperatively demanded by the necessities of war appear to be outlawed. Additionally, under the principle of discrimination, attacks targeting environmentally meaningful areas, such as national parks and forests, are to be considered contrary to this principle.[17] Accordingly, all forms of deliberate ecological damage, such as the poisoning of water supplies or the destruction of agricultural land, would appear to fall within the scope of application of the present prohibition.[18]

To conclude on the general framework of international humanitarian law providing for the protection of the environment during armed hostilities, it is possible to affirm that the activities of Armenia and private companies operating under its supervision[19] in the formerly occupied territories of Azerbaijan are contrary to a great number of the treaty law and customary international law provisions described in this section.

The law of occupation and environmental protection

Alongside international humanitarian law, mentioning the law of occupation in relation to environmental protection appears to be relevant for the case considered. As a matter of fact, the widely recognized occupation of the territory of Azerbaijan by Armenia for

14 *Ibid.*

15 Henckaerts, J.M., Doswald-Beck, L., *Customary International Humanitarian Law – Volume I: Rules* (Cambridge: Cambridge University Press, 2009), Rule 43.

16 Afriansyah, A., "The adequacy of international legal obligations for environmental protection during armed conflict", *Indonesia Law Review*, Volume 3, Issue 1, January – April 2013, p.70.

17 *Ibid*, p.71.

18 Kirchner, A., "Environmental protection in time of armed conflict*", European Environmental Law Review*, October 2020, p.269.

19 Chabert, *op.cit.*

almost three decades opens the possibility of applying the body of law of occupation to the context at issue. The law of occupation is part of international humanitarian law, and it includes the rules applicable when no hostilities exist, since an occupying power has established itself in the territory it has conquered. Indeed, the main difference from general international humanitarian law concerns the fact that the armed conflict in the specific occupied territory has stopped.

The sources of international law regulating occupation can be traced back to the Regulations Annexed to the Hague Convention IV on War on Land of 1907 (and specifically articles 42–56), the Geneva Convention (IV) of 1949 on the Protection of Civilian Persons in Time of War, and the Additional Protocol I of 1977. These legal documents also contain provisions that are applicable to environmental protection during occupation. At the same time, the jurisprudence of international tribunals appears to be relevant. Hence, the *Advisory Opinion on the Wall in Palestine* of the International Court of Justice of 2004 and the Case *DRC. v. Uganda* of 2005 are of great importance for the law of occupation, since these provide relevant interpretation of the rules applicable when an occupying power establishes itself in a territory previously affected by war.

Against this background, it has to be noted that occupation and armed conflicts differ in many aspects. First of all, the absence of active hostilities typically characterizes occupation. Secondly, during occupation, the authority over a certain territory is transferred without the consent of a territorial state (in this case, Azerbaijan) to the occupying power. The occupation is extended only to the territory where such authority has been established and can be exercised.[20] As they are of interest for the present paper, the main rules of the international law of occupation as derived from the abovementioned Conventions can be summarized as follows:

a. Sovereignty over the occupied territory remains under the dispossessed state.

b. According to article 55 of the Hague Convention (IV), the occupying state is not the owner but only the usufructuary of the occupied territory and properties therein, that must be handled in good faith.

20 Dinstein, Y., *The international law of belligerent occupation,* (Cambridge: Cambridge University Press, 2011).

c. The safeguard of the natural resources of the occupied territory according to the principle of conservation directly originates from article 55 and it is further remarked in the Report of the Special Rapporteur on the situation of human rights in the Palestinian territories occupied since 1967.[21] Accordingly, the occupying power has no legal authority to exploit any of the resources and property of the territory for the benefit of its own economy. The purpose of this rule is to remove any incentive for the occupying power to act in a predatory or avaricious manner towards the occupied territory and its wealth, thereby discouraging war and prolonged alien rule.

d. The occupying power's administration and use of natural resources in the occupied territory may only be for the benefit of the population of the occupied territory and for other lawful purposes under the law of armed conflict.

e. The prohibition of pillage of natural resources is applicable to occupation.

f. Each state has the obligation to avoid causing significant harm to the environment of other states or areas beyond national jurisdiction, as stated in the 1996 Legality of the Threat or Use of Nuclear Weapons Advisory Opinion of the International Court of Justice, which confirmed its customary nature.[22]

Along these lines, in 2022 the International Law Commission adopted at the first reading 27 Draft Principles on Protection of the Environment in Relation to Armed Conflicts.[23] Notably, part four of the Draft Principles is devoted to the codification of principles applicable in situations of occupation. In this regard, according to principle 19, "an occupying power shall respect and protect the environment of the occupied territory in accordance with applicable international law and take environmental

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21 Human Rights Council 40th Session, Agenda Item 7, *Human rights situation in Palestine and other occupied Arab territories*, A/HRC/40/73, March 15, 2019, Available at: https://www.ohchr.org/EN/pages/home.aspx (Accessed: March 2, 2024).

22 International Court of Justice, "Advisory Opinion on the Legality of the Threat or Use of Nuclear Weapons", 1996, Available at: https://www.icj-cij.org/public/files/case-related/95/095-19960708-ADV-01-00-EN.pdf (Accessed: March 4, 2024).

23 International Law Commission, "Draft principles on protection of the environment in relation to armed conflicts", 2022, Available at: https://legal.un.org/ilc/texts/instruments/english/draft_articles/8_7_2022.pdf (Accessed: March 4, 2024).

considerations into account in the administration of such territory."[24] Similarly, paragraph 2 of the same principle affirms that the occupying power shall take appropriate measures to prevent significant harm to the environment of the occupied territory.[25] In addition, principle 20 clarifies the law of occupation with respect to the sustainable use of natural resources, entirely in accordance with the provisions enshrined in the Hague Conventions that deal with environmental protection. More precisely, principle 20 indicates that the occupying power is permitted to administer and use the natural resources in an occupied territory for the benefit of the protected population under the law of armed conflict "in a way that ensures their sustainable use and minimizes harm to the environment".[26]

The Bern Convention and Inter-state Arbitration

In light of the examination of the current framework of international humanitarian law on the protection of the environment during armed conflict, this section considers inter-state arbitration to be the most efficient and potentially successful legal strategy for Azerbaijan to obtain compensation from Armenia for the breach of the above-mentioned rules of international law. As has been explained in the previous sections, and especially in the introduction, this mainly depends on the difficulties associated with both the legal impediments (namely the status of corporations in international law and the identification of which state is competent to adjudicate a case of environmental damage involving a corporation) in seeking redress before national tribunals, as well as in suing allegedly responsible foreign corporations before their home state's court. For these reasons, pursuing the road of arbitration could be configured as a relatively comprehensive strategy to assess Armenia's responsibility and eventually receive compensation for the illegal exploitation of Azerbaijan's natural and mineral resources in the formerly occupied territories during the occupation. This same strategy appears to be meticulously followed by Azerbaijan, which up to the present has launched two interstate arbitrations against Armenia for environmental damage committed on its territory during the past thirty years.

24 *Ibid*. at principle 19(1).

25 *Ibid.* at principle 19(2).

26 *Ibid*. at principle 20.

Evidence collected by Azerbaijan includes indication of severe harm to the Garabagh region's natural habitats and species; depletion of natural resources; destruction of biodiversity; widespread deforestation; pollution through significant mining in protected nature reserves; and, especially, water pollution of transboundary rivers that run from Armenia into Azerbaijan's territory.

Within the framework of the Council of Europe, on January 18, 2023, Azerbaijan commenced the first known inter-state arbitration under the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) adopted in 1979, the aim of which is to ensure conservation of wild flora and fauna species and their habitats (including endangered and vulnerable ones).[27] According to a recent press release of the Ministry of Foreign Affairs of Azerbaijan, the arbitration aims at holding Armenia accountable for the extensive harm caused to Azerbaijan's environment and biodiversity over the period of nearly thirty years during which the internationally recognized sovereign territory of Azerbaijan was occupied.[28]

Evidence collected by Azerbaijan includes indication of severe harm to the Garabagh region's natural habitats and species; depletion of natural resources; destruction of biodiversity; widespread deforestation; pollution through significant mining in protected nature reserves; and, especially, water pollution of transboundary rivers that run from Armenia into Azerbaijan's territory.

Furthermore, Azerbaijan demands the cessation of all ongoing violations of the Bern Convention and the payment of full reparation for the environmental harm perpetrated in the formerly occupied territories. Before this reaches the arbitration panel, however, a standing committee composed of all the contracting parties will have to use its best endeavours to facilitate a friendly settlement of the dispute, as envisaged by article 18 of the Bern Convention.[29] Only in case of failure can a formal arbitration process be launched before an arbitration tribunal. Nonetheless, as the procedure has never been activated, the

27 Council of Europe, Convention On The Conservation Of European Wildlife And Natural Habitats, Standing Committee, 43rd meeting Strasbourg, April 14, 2023, Available at: https://rm.coe.int/tpvs07e-2023-meeting-report-1st-bureau-2023/1680aac4cb (Accessed: March 16, 2024).

28 Ministry of Foreign Affairs of the Republic of Azerbaijan, "Press Release on arbitration filed by Azerbaijan against Armenia for widespread environmental destruction", No: 015/23, January 18, 2023, Available at: https://www.mfa.gov.az/en/news/no01523 (Accessed: March 17, 2024).

29 Council of Europe, "Convention on the Conservation of European Wildlife and Natural Habitats", ETS No.104, 1979, art. 18.

advancement of any possible prediction concerning the development of the lawsuit and the kind of compensation states will be able to request does not yet appear to be feasible. Given the nature of Azerbaijan's claims, rules relating to scientific evidence and the possible appointment of experts in respect of the identification, attribution, and assessment of environmental damage will, in all likelihood, be of great relevance. In any case, if the proceedings launched by Azerbaijan against Armenia were to result in an arbitral award on the merits, this would be an important precedent with potentially significant repercussions on the Council of Europe's approach to environmental protection in armed conflict.[30]

The Energy Charter Treaty Arbitration

Separately from the Bern Convention action, on February 27, 2023, Azerbaijan filed a further arbitration case against Armenia pursuant to article 27 of the Energy Charter Treaty (ECT)[31] on the grounds of illegal exploitation of natural resources in the territory of Azerbaijan, which further caused environmental damage in the area. Having entered into force on April 16, 1998, the ECT is a fundamental legal instrument for the promotion of international cooperation in the energy sector, as well as a relatively important political basis for an open international energy market. Indeed, the treaty was preceded by a political declaration adopted in the Hague in 1991 that contains the commitment of state parties to negotiate in good faith regarding the subsequently adopted ECT.[32]

The initiation of arbitration proceedings by Azerbaijan is aimed at addressing the multiple breaches of the ECT and of international law

30 Abualrob, W., Longobardo, M., Mackenzie, R., "Applying International Environmental Law Conventions in Occupied Territory: The Azerbaijan v. Armenia Case under the Bern Convention", *EJIL Talk*, May 12, 2023, Available at: https://www.ejiltalk.org/applying-international-environmental-law-conventions-in-occupied-territory-the-azerbaijan-v-armenia-case-under-the-bern-convention/ (Accessed: April 27, 2024).

31 Ministry of Foreign Affairs of Azerbaijan, "Press Release on arbitration case filed by Azerbaijan against Armenia under the Energy Charter Treaty for illegal exploitation of Azerbaijan's energy resources", No:093/2327, February 2023, Available at: https://mfa.gov.az/en/news/no09323 (Accessed: March 20, 2024).

32 The International Energy Charter, Consolidated Energy Charter Treaty with Related Documents, Last updated January 15, 2016, Available at: https://www.energycharter.org/fileadmin/DocumentsMedia/Legal/ECTC-en.pdf (Accessed: March 20,2024).

According to the Azerbaijan's arguments, during the period of unauthorized control, not only did Armenia prevent Azerbaijan from accessing its own energy resources, but it also appropriated them, thereby preventing Azerbaijan from exploiting and developing their potential.

committed by Armenia. In particular, the intention is to seek redress and financial compensation for Armenia's violation of Azerbaijan's sovereign rights over its energy resources during the former's occupation.[33] According to the Azerbaijan's arguments, during the period of unauthorized control, not only did Armenia prevent Azerbaijan from accessing its own energy resources, but it also appropriated them, thereby preventing Azerbaijan from exploiting and developing their potential. These resources include hydropower, wind and solar energy in the entire Garabagh region.[34] Therefore, on February 5, 2024, the first procedural meeting between Armenia and Azerbaijan was held before the Permanent Court of Arbitration in The Hague, the Netherlands.[35] The meeting was chaired by Ms Jean E. Kalicki from the United States, and it marked a significant step in the ongoing arbitration process, with both parties engaging in discussions concerning the procedural framework.[36] Indeed, the delegation of Azerbaijan, led by Deputy Minister of Foreign Affairs Elnur Mammadov, and the Armenian counterpart headed by the country's Representative on International Legal Matters, Yeghishe Kirakosyan, subsequently appointed their respective arbitrators. Alongside Ms Kalicki, the three-arbitrator panel will be composed of Professor Donald M. McRae from New Zealand, appointed by Azerbaijan, and French professor Brigitte Stern, designated by Armenia.[37] Within this framework, there is reason

33 Center of Analysis of International Relations, "Azerbaijan seeks justice against Armenia in landmark Energy Charter Treaty arbitration", *Monthly Bullettin*, January 2024.

34 Moody, S., "First inter-state ECT claim gets underway", *Global Arbitration Review*, January 16, 2024, Available at: https://globalarbitrationreview.com/article/first-inter-state-ect-claim-gets-underway (Accessed: March 22, 2024).

35 Permanent Court of Arbitration, The Republic of Azerbaijan V. The Republic of Armenia, Case No. 2023-65, Press Release, February 5, 2024, Available at: https://docs.pca-cpa.org/2024/02/aa96edc1-2023-65-20240205-press-release.pdf (Accessed: March 22, 2024).

36 Diplomat Magazine, *The Republic of Azerbaijan V the Republic of Armenia: First Procedural Meeting in Arbitration under energy Charter Treaty*, February 10, 2024, Available at: https://diplomatmagazine.eu/2024/02/10/the-republic-of-azerbaijan-v-the-republic-of-armenia-first-procedural-meeting-in-arbitration-under-energy-charter-treaty/ (Accessed: March 24, 2024).

37 Permanent Court of Arbitration, "The Republic of Azerbaijan v. The Republic of Armenia", Case number 2023-65, Available at: https://pca-cpa.org/en/cases/312/ (Accessed: March 25, 2024).

to suppose that a possible positive outcome will follow Azerbaijan's request for arbitration as, unlike the previously discussed potential case involving the Bern Convention, there is previous case law of successful arbitration advanced under the Energy Charter Treaty relating to the exploitation of natural resources.

Indeed, in a further difference from the Bern Convention arbitration, the Energy Charter Treaty can count on a wide range of precedents and extensive jurisprudence on this matter. In this regard, the first international arbitration invoking the ECT dates back to the dispute between the company AES and Hungary in 2001, only three years after the ECT entered into force.[38] Moreover, an increasing trend in the number of arbitrations pursuant to the ECT between 2003 and 2013 can be observed, with a peak in 2015 with 25 arbitration cases. At the moment, there are more than 150 publicly known ECT proceedings.[39] The increasing number of arbitration cases went hand in hand with an evolution of the subject matter of ECT arbitrations to include renewable energy matters.[40] For the above-mentioned reasons, the arbitration requested by Azerbaijan pursuant to the ECT appears to be a potentially practicable and successful route to obtain compensation for wrongful acts in terms of illegal exploitation of Azerbaijan's energy resources by Armenia during the period of the latter's occupation.

Conclusion

In considering environmental protection during armed conflict under international humanitarian law and the law of occupation, the present article is an attempt to demonstrate that the road pursued by Azerbaijan toward compensation for ecosystem damage committed during Armenia's occupation of the former's territories could be a

38 *AES Summit Generation Limited v. The Republic of Hungary*, ICSID Case No. ARB/01/04, 2001.

39 International Energy Charter, "List of all Investment Dispute Settlement Cases", Available at: https://www.energychartertreaty.org/cases/list-of-cases (Accessed: 25 March 2024).

40 Patrizia, C. A., Profaizer, J. R., Cooper, S. V., Timofeyev, I. V., "Investment Disputes Involving the Renewable Energy Industry Under the Energy Charter Treaty", *Global Arbitration Review*, October 2, 2015, Available at: https://globalarbitrationreview.com/guide/the-guide-energy-arbitrations/4th-edition/article/investment-disputes-involving-the-renewable-energy-industry-under-the-energy-charter-treaty (Accessed: April 27,2024).

viable option to obtain compensation for environmental wrongdoing and assess Armenia's responsibility.

As a matter of fact, seeking compensation by resorting to arbitration has more probability of succeeding due to positive jurisprudence in this regard. More specifically, unlike the uncertainties that have been revealed in the present article, arbitration will, once started, necessarily achieve a final award, and companies could be involved alongside the opposing States. Indeed, arbitration is traditionally the best option for bringing claims against a private company and, as corporations played a role in environmental wrongdoing during the occupation of Azerbaijani territory, this legal attempt could prove a viable solution to obtain compensation. Even though inter-state arbitration launched pursuant to the Bern Convention of the Council of Europe is the first of its kind and the result still appears to be uncertain, successful examples in the jurisprudence of the Permanent Court of International Arbitration with respect to the Energy Charter Treaty potentially shed a positive light on the future successful outcome of the arbitration launched by Azerbaijan against Armenia.

In any case, in the author's view, arbitration remains the most efficient legal instrument for seeking compensation for irresponsible environmental behaviour committed on the territory of Azerbaijan during the occupation as, in comparison with inter-state disputes before other national or international courts, it gives a quick and tangible response to the wide set of impediments intrinsic to international law, as well as to the eventual difficulties in suing foreign corporations before national tribunals. At the same time, receiving compensation would represent a first step towards the acknowledgement of environmental responsibility and opening the road to post-war environmental recovery in the region.

Environmental aspects of the reconstruction process in Garabagh and Eastern Zangezur regions

Orkhan Baghirov*

The primary objective of this article is to analyse the environmental dimensions of the reconstruction process in Azerbaijan's liberated territories. It begins by examining the environmental impact of the occupation of Armenia, highlighting the extensive damage caused to the ecosystem of the liberated territories, including flora, fauna, and water resources. Following the initial analysis of the environmental repercussions of the occupation, the article delves into the environmental aspects of the reconstruction effort, showcasing various measures and projects aimed at revitalizing the region's flora and fauna, promoting renewable energy sources such as wind and solar energy, establishing 'Green Energy Zones' and 'Smart Villages', and employing smart agriculture techniques. Through these strategies, Azerbaijan demonstrates a comprehensive approach not only to addressing the environmental devastation caused by the occupation but also to proactively creating new ecosystems, which aligns with global sustainable development goals and will have less environmental impact. This indicates Azerbaijan's commitment to not only restoring but also enhancing the environmental sustainability of the liberated territories.

Keywords: Azerbaijan, Armenia, Garabagh, Eastern Zangezur, Environment, South Caucasus"

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Introduction

Following the dissolution of the Soviet Union in the early 1990s, Armenia's territorial claims against Azerbaijan escalated into full-scale war. By the end of 1994 when the war ended, Armenia's armed forces occupied about 20% of Azerbaijan's territories including the Garabagh region (formerly the Nagorno-Karabakh Autonomous Oblast (NKAO)) and seven surrounding districts (Lachin, Kalbajar, Aghdam, Fuzuli, Jabrayil, Gubadli, and Zangilan). Despite the ceasefire reached in 1994 that ended active hostilities, the [former] conflict remained unresolved, with intermittent skirmishes and periodic escalations until 2020. The conflict caused massive internal displacement, with up to 700.000 Azerbaijanis fleeing the occupied territories for other parts of the country. The occupation has had profound humanitarian, political, and socio-economic impacts on Azerbaijan and the entire region.

Along with its political and economic implications, the occupation has also had significant environmental impacts. Deforestation in the occupied territories, intentional setting of fires, destruction of plant and animal species, pollution of rivers and tributaries, degradation of fertile soil, and illegal exploitation of natural resources by Armenia have caused long-term and irreversible environmental damage in Azerbaijan. According to the Ministry of Ecology and Natural Resources of Azerbaijan, the country suffered ecological and natural resource damage amounting to a total of US$285 billion due to the occupation.[1] Following the end of the occupation in 2020, Azerbaijan initiated rapid restoration projects in the previously occupied (now liberated) territories.

Recognizing the significant environmental damage caused by the occupation, Azerbaijan places special focus on restoring the environmental balance in these areas. This includes rehabilitating forests, reclaiming polluted lands, and revitalizing ecosystems.

Recognizing the significant environmental damage caused by the occupation, Azerbaijan places special focus on restoring the environmental balance in these areas. This includes rehabilitating forests, reclaiming polluted lands, and revitalizing ecosystems. Through these efforts, Azerbaijan aims to promote environmental sustainability and resilience in these territories. The main goal of this article is to

1 Center for Analysis of Economic Reforms and Communication of the Republic of Azerbaijan, "New Karabakhnama: Post-Conflict Construction in Karabakh And Eastern Zangezur Economic Regions", 2022, Available at: https://ereforms.gov.az/files/publications/pdf/en/11a6f3b74851df261afd1b5bab1f920e.pdf (Accessed: May 30, 2024)

explore the environmental aspects of the reconstruction process in the liberated territories of Azerbaijan.

Environmental implications of the occupation

During the occupation, large-scale deforestation occurred as trees (such as walnut, oak, and other species) were cut down for fuel, construction, and export purposes, which led to a loss of biodiversity. Forests used for cattle grazing were also heavily destroyed in some parts of the occupied districts. Several protected tree and shrub species, such as the yew tree, Araz oak, eastern plane, pomegranate, forest grapes, Buasye pear, box tree, Eldar pinewood, persimmon, and willow-leafed pear, are now on the brink of extinction.[2] Between the mid-1980s and the mid-1990s, the forest and woodland area declined by 12.5%.[3] Additionally, Armenia has used natural resources as a weapon by deliberately setting fires to harm Azerbaijani civilians living near the former line of contact. Since 2006, these fires have destroyed over 110,000 hectares of fertile soil, causing significant environmental damage.[4]

Along with deforestation, water resources were also negatively affected by the occupation due to infrastructure damage and lack of maintenance, leading to pollution and disruption of water supplies. Around 120 mineral water wells, crucial for their medicinal properties, were damaged.[5] Additionally, rivers originating from the Lesser Caucasus mountain range, such as the Tartar, Hakari, Khachinchay, and Kondalanchay, which supplied water to low-lying regions, were also affected.[6] Armenia polluted small rivers flowing into the Kur and Araz rivers with chemicals and heavy metals.[7]

According to Azerbaijan's Ministry of Ecology and Natural Resources, the Okhchuchay River, near the border of Armenia in the direction of

2 Huseynov, V., "The environmental costs of the Armenian occupation of Azerbaijani territories*", Aircenter.az*, 2021, Avaliable at: https://aircenter.az/uploads/8PDGIC23ldxV.pdf (Accessed: May 30, 2024)

3 *Ibid.*

4 Ministry of Foreign Affairs of the Republic of Azerbaijan, *Environmental Damage*, 2022, Available at: https://mfa.gov.az/en/category/consequences-of-the-aggression-by-armenia-against-azerbaijan/environmental-damage (Accessed: May 30, 2024)

5 *Ibid.*

6 *Ibid.*

7 *Ibid.*

Zangilan district, had dangerous levels of various metal compounds.[8] This pollution, stemming from Armenia's Gajaran Copper-Molybdenum Plant and the Gafan Ore Refinery, resulted in heavy metal sedimentation and extinction of rare fish species and posed serious health risks.[9] The contamination of the Okhchuchay River also degraded the water quality of the Araz, the South Caucasus's second-largest river.[10]

The formerly occupied territories of Azerbaijan are also rich in mineral resources. Among the 155 mineral resource deposits found in these areas are valuable commodities such as gold, mercury, copper, lead, and zinc. These resources, along with abundant building materials such as face stone, block stone, various construction stones, loam, sang-gravel, chromite, lime, marble, and agate have been ruthlessly exploited by Armenia.[11] The depredatory exploitation of these resources has led to widespread environmental degradation.[12] Toxic chemicals and heavy metals used in mining operations have contaminated soil, water sources, and the air, posing serious health risks to both humans and wildlife.[13]

The landmines planted during the occupation in the Garabagh and Eastern Zangezur regions also have detrimental effects on the environment. These explosive devices, along with their chemical components, pose a risk of permanent harm to humans, animals, vegetation, water, land, and the overall ecosystem.

The landmines planted during the occupation in the Garabagh and Eastern Zangezur regions also have detrimental effects on the environment. These explosive devices, along with their chemical components, pose a risk of permanent harm to humans, animals, vegetation, water, land, and the overall ecosystem.[14]

8 Ministry of Ecology and Natural Resources of the Republic of Azerbaijan, *The pollution of Okchuchay by Armenia caused mass death of fish* (translation from Azerbaijani), March 10, 2021, Available at: https://eco.gov.az/az/nazirlik/xeber?newsID=12102 (Accessed: June 29, 2024)

9 Ministry of Ecology and Natural Resources, *The pollution of Okchuchay…*, *op.cit.*

10 Azvison, *Armenia's eco-terror: Facts about pollution of Okhchuchay River*, June 29, 2021, Available at: https://en.azvision.az/news/146362/news.html (Accessed: June 29, 2024)

11 Ministry of Foreign Affairs of the Republic of Azerbaijan, *Illegal economic and other activities in the occupied territories of Azerbaijan*, 2016, Available at: https://geneva.mfa.gov.az/files/MFA_Report_on_the_occupied_territories_1.pdf (Accessed: June 29, 2024)

12 Mustafayeva, A., and Garayev, R., "Legal Aspects of Reparation for Damage Caused to Azerbaijan as a Result of Armenian Aggression", *IRS Heritage*, 2017, p.56, https://irs-az.com/new/pdf/201309/1380093954626732529.pdf (Accessed: May 30, 2024)

13 Karabakh Center, *Ecocide in Karabakh*, 2021, Available at: https://story.karabakh.center/en/ecocide-in-karabakh (Accessed: June 29, 2024)

14 Pavlenko, A., "Landmines in Azerbaijan's Karabakh smashing up environment-

Environmental aspects of the reconstruction

Revitalizing flora and fauna

The almost three-decades-long occupation of Armenia came to an end in 2020 during the Second Garabagh War, which lasted from September 27 to November 10. In the war, Azerbaijan's army achieved a convincing victory, liberating the territories that had been under occupation for almost three decades[15]. Immediately after the war, Azerbaijan initiated a restoration process under the 'Great Return' programme.[16] This comprehensive programme aims to rebuild and revitalize the liberated territories, focusing on infrastructure development, housing construction, and the restoration of public services. The plan also emphasizes the importance of demining efforts, ecological restoration, and the return of internally displaced persons to their ancestral lands.[17]

Efforts to restore the environment in the liberated territories and address the extensive damage to flora and fauna caused by the occupation have been significant. Key initiatives include rehabilitating forests, reclaiming polluted lands, and revitalizing ecosystems. Afforestation projects launched to combat widespread deforestation involve the planting of native tree species to rebuild forest ecosystems and enhance biodiversity.[18] Wildlife reintroduction programmes aim to restore the fauna ecosystem by reintroducing native species that were adversely affected or displaced during the occupation. These projects are expected to play a crucial role in restoring the region's biological diversity.

To restore the forests damaged during the occupation, several tree-planting campaigns have been initiated since the war. In December 2020, a tree-planting campaign was conducted in Aghali village of

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ANAMA", *Trend*, May 30, 2024, Avaliable at: https://en.trend.az/azerbaijan/politics/3905906.html (Accessed: June 1, 2024)

15 Prosecutor General's Office of the Republic of Azerbaijan, *The 44-day Patriotic War (II Karabakh War)*, 2021, Available at: https://genprosecutor.gov.az/en/page/azerbaycan/i-ve-ii-qarabag-muharibesi/44-gun-suren-veten-muharibesi-ii-qarabag-muharibesi (Accessed: June 29, 2024)

16 President.az, *Decree of the President of the Republic of Azerbaijan on the approval of the "I State Program on the Great Return to the territories of the Republic of Azerbaijan freed from occupation"* (translation from Azerbaijani), November 16, 2022, Available at: https://president.az/az/articles/view/57883 (Accessed: June 29, 2024)

17 *Ibid.*

18 Azvision.az, *A program on forest restoration has been prepared in Karabakh* (translation from Azerbaijani), November 4, 2023, Available at: https://azvision.az/news/343413/news.html (Accessed: June 29, 2024)

Zangilan, organized jointly by the IDEA Public Union and the Ministry of Ecology and Natural Resources. During this campaign, 500 trees of various species, suitable for the local soil and climate conditions, were planted.[19] Additionally, seeds of oak, oriental sycamore, and mulberry trees were sown, initiating the effort to restore ecological sustainability in Zangilan district.[20] In 2021, an additional 1,000 trees were planted in Zangilan through a joint initiative by the Garabagh Revival Fund and the Ministry of Ecology and Natural Resources to protect ecological diversity.[21] As part of this project, 30,000 trees, including Eldar pine, evergreen cypress, and cypress suited to the local climate were planted on a 30-hectare area at the entrance to Zangilan city[22]. Plans also include planting devil trees and oriental sycamore.

To date, more than 40,000 saplings, including species such as Eldar pine, goryush, elm, and dagdagan, have been planted across the Jabrayil, Zangilan, Gubadli, Fuzuli, Lachin, Kalbajar, and Aghdam districts, and the city of Shusha.[23]. Additionally, more than 2 tons of oak seeds have been sown.[24] Ongoing tree planting efforts include plans for new green areas in Zangilan (around 55 hectares), along the right side of the Jabrayil–Hadrut highway (15 hectares), and in Fuzuli district (approximately 200 hectares).[25]

Simultaneously, the Ministry of Ecology and Natural Resources

19 Azerbaijan-news.az, *The forests of Karabakh are being restored* (translation from Azerbaijani), March 20, 2022, Available at: https://www.azerbaijan-news.az/az/posts/detail/qarabagin-meseleri-berpa-olunur-1647724800 (Accessed: June 29, 2024)

20 Saftarov, E., "1,000 trees were planted in Zangilan city in connection with the establishment of the «From Triumph to Revival» forest massif" (translation from Azerbaijani), *Azertag*, December 17, 2021, Avaliable at: https://azertag.az/xeber/zengilan_seherinde__quotzeferden_dirchelise_quot_mese_massivinin_salinmasi_ile_elaqedar_1000_eded_agac_ekilib-1954168 (Accessed: June 1, 2024)

21 Respublika-news.az, *1,000 trees were planted in Zangilan city in connection with the establishment of the «From Triumph to Revival» forest massif* (translation from Azerbaijani), December 18, 2021, Avaliable at: https://respublika-news.az/news/zengilan-seherinde-zeferden-dircelise-mese-massivinin-salinmasi-ile-elaqedar-1000-eded-agac-ekilib (Accessed: June 1, 2024)

22 *Ibid*.

23 Azertag.az, *To date, 40,000 tree seedlings have been planted in Karabakh* (translation from Azerbaijani), January 6, 2023, Available at: https://azertag.az/xeber/bu_gune_qeder_qarabagda_40_min_agac_tingi_ekilib-2435843 (Accessed: June 28, 2024)

24 *Ibid*.

25 Azerbaijan-news.az, *The forests of Karabakh are being restored* (translation from Azerbaijani), Mart 20, 2022, Available at: https://www.azerbaijan-news.az/az/posts/detail/qarabagin-meseleri-berpa-olunur-1647724800 (Accessed: June 1, 2024)

developed the 'Restoration of the Forest Fund' programme for 2022–26.[26] This programme aims to restore a total of 30,000 hectares of forest fund area through forest restoration, planting, and natural regeneration efforts. Once the landmines are fully cleared in the Kalbajar and Lachin districts, tree-planting initiatives are planned for 455 hectares.

From an environmental perspective, the reconstruction process in the liberated territories has focused not only on rehabilitating the flora and fauna, which were heavily damaged during the occupation, but also on creating a self-sustaining environment.

For restoring biodiversity in the liberated territories, alongside the tree-planting campaigns, the Biodiversity Conservation Service of Azerbaijan Republic has announced plans for the reintroduction of fauna species such as gazelle, bezoar goat, Dagestan tur, red deer, fish, and raptor bird species.[27] Plans are in place for the return of gazelle populations to Jabrayil and Zangilan districts.[28] The reintroduction of 293 gazelles to natural areas has been completed, with over 7,000 gazelles recorded in Azerbaijan according to the latest survey.[29] Substantial progress has been made in restoring fish populations, exemplified by the release of golden-throated trout in rivers within the liberated territories.[30]

Development of renewable energy sources

From an environmental perspective, the reconstruction process in the liberated territories has focused not only on rehabilitating the flora and fauna, which were heavily damaged during the occupation, but also on creating a self-sustaining environment. This approach aligns with sustainability goals and ensures future environmental protection in these areas. One of the main features of this approach is the development of

26 Tv.ikisahil.az, *A clean environment means a healthy life* (translation from Azerbaijani), September 23, 2022, Available at: https://tv.ikisahil.az/post/348189-temiz-etraf-muhit-saglam-heyat-demekdir (Accessed: June 2, 2024)

27 Ministry of Ecology and Natural Resources of the Republic of Azerbaijan, "Biodiversity components are being returned to their historic areas in the areas freed from occupation" (translation from Azerbaijani), May 27, 2023, Available at: https://eco.gov.az/az/nazirlik/xeber?newsID=17938 (Accessed: June 27, 2024)

28 Sesqazeti.az, *Biodiversity in Karabakh: How to restore it?* (translation from Azerbaijani), December 28, 2023, Available at: https://sesqazeti.az/news/mia/1118070.html (Accessed: June 2, 2024)

29 *Ibid.*

30 *Ibid.*

renewable energy sources and their transformation into a main energy source for the liberated territories, thereby increasing energy efficiency and minimizing environmental impact.

The liberated territories possess significant potential for renewable energy production. The southern plains, including the districts of Fuzuli, Jabrayil, and Zangilan, have particularly high solar radiation levels.[31] These areas receive an annual average of between 1,600 and 1,700 kilowatts of solar radiation per square meter of horizontal surface, with a total solar energy potential of 3,000 to 4,000 megawatts.[32] Eight promising sites with a combined potential of over 4,000 MW have been identified for solar power plants (SPP) in six districts: Fuzuli, Jabrayil, Zangilan, Gubadli, Lachin, and Kalbajar.[33] Additionally, Kalbajar and Lachin districts have significant wind energy potential.[34] According to preliminary estimates by the International Renewable Energy Agency, the liberated areas have a solar energy potential exceeding 4,000 MW and a wind energy potential of up to 500 MW.[35]

Hydroelectric power plants (HPP) are expected to be instrumental in boosting renewable energy production in the recently liberated territories, which are rich in water resources, accounting for roughly 25% of Azerbaijan's total water reserves.[36] Following the liberation, Azerbaijan has launched extensive projects aimed at rebuilding and enhancing HPP infrastructure in these areas. A significant focus has been placed on these initiatives due to the strategic importance of harnessing

31 The Ministry of energy of Azerbaijan, *Energy Potential of Nagorno-Karabakh And Surrounding Regions*, November 2, 2020, Available at: https://minenergy.gov.az/en/xeberler-arxivi/dagliq-qarabag-ve-etraf-regionlarin-enerji-potensiali (Accessed: June 28, 2024

32 *Ibid*.

33 Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan, *The work to be done to calculate the exact potential for renewable energy in the liberated territories was discussed*, December 8, 2020, Available at: https://area.gov.az/en/news/34/isgaldan-azad-edilmis-erazilerde-berpa-olunan-enerji-uzre-deqiq-potensialin-hesablanmasi-sahesinde-gorulecek-isler-muzakire-edilib (Accessed: June 30, 2024)

34 *Ibid*.

35 Aircenter.az, *Main Directions of the Restoration Process in the Liberated Areas* (translation from Azerbaijani), March, 2020, Available at: https://aircenter.az/uploads/files/orxan%20tehlil%20mart.pdf (Accessed: June 29, 2024)

36 Abc.az, *We now have full possession of our water resources*, April 16, 2024, Available at: https://abc.az/en/news/144124/we-now-have-full-possession-of-our-water-resources (Accessed: June 27, 2024)

hydroelectric power. The abundance of rivers and other water bodies in these territories offers a substantial opportunity for sustainable energy generation. Azerbaijan's commitment to renewable energy is evident in the vigorous reconstruction efforts, which include modernizing existing HPPs and developing new facilities.

Since the onset of these initiatives, considerable progress has been achieved, with the construction or reconstruction of a total of 26 HPPs.[37] Currently, active construction is under way at nine additional sites, reflecting a robust dedication to maximizing the hydroelectric potential of these regions. These efforts are part of a broader strategy to diversify Azerbaijan's energy portfolio, reduce reliance on fossil fuels, and promote environmental sustainability through the increased use of renewable energy sources.

Additionally, in 2021, Azerbaijan passed a law "*On the use of renewable energy sources in the production of electricity*". This legislation, along with other reforms and legal measures, is anticipated to boost the development of renewable energy in the Garabagh region and strengthen its role in ensuring the energy security of the country. The goal is to increase the share of renewable energy sources in the country's total electricity production to 30% by 2030.[38] Currently, renewable energy accounts for 17% of the country's electricity production, highlighting a strong commitment to significantly enhancing the use of renewable energy in the region.

Creation of Green Energy Zones

The main goal of the energy policy for the liberated territories is to transform these areas into Green Energy Zones, prioritizing the use of renewable energy sources and the implementation of environmentally friendly technologies. In line with the order signed by the President[39] of

37 Trend.az, *Azerbaijan discloses number of hydropower plants on its liberated territories*, October 16, 2023, Available at: https://en.trend.az/business/energy/3812374.html (Accessed: June 27, 2024)

38 The Ministry of energy of Azerbaijan, *The Use of Renewable Energy Resources in Azerbaijan*, March 6, 2024, Available at: https://minenergy.gov.az/en/alternativ-ve-berpa-olunan-enerji/azerbaycanda-berpa-olunan-enerji-menbelerinden-istifade (Accessed: June 28, 2024)

39 President.az, *Decree of the President of the Republic of Azerbaijan on measures related to the establishment of a "green energy" zone in the liberated territories of the Republic*

The reconstruction of the Garabagh region underscores a dedication to environmentally cleaner approaches in agriculture, manufacturing, construction, and daily life that align with sustainable development principles.

the Republic of Azerbaijan in 2021 to establish a Green Energy Zone in the liberated territories, an international consulting firm has been engaged and a concept document has been prepared in collaboration with the Japanese company TEPSCO.[40] This document aims to supply the region with eco-friendly green energy by leveraging the substantial renewable energy potential in the liberated territories and developing proposals for the application of environmentally friendly and energy-efficient green technologies.

The Green Energy Zone initiative includes plans for electricity generation from renewable sources, implementing energy efficiency measures, promoting the use of electric vehicles, installing solar panels on building rooftops, using solar-powered LED lamps for street and road lighting, employing renewable energy technologies for heating, cooling, and hot water supply, applying smart energy management systems, and managing waste energy effectively. These plans would collectively protect the environment and promote sustainable development in the region by reducing greenhouse gas emissions and minimizing air pollution in the liberated territories.

Smart Villages

The reconstruction of the Garabagh region underscores a dedication to environmentally cleaner approaches in agriculture, manufacturing, construction, and daily life that align with sustainable development principles. The initiative of transforming the liberated territories into environmentally cleaner regions is framed within the context of the internationally established Sustainable Development Goals.[41] The efforts to employ eco-friendly practices particularly aim at achieving Goal 11, "ensuring ecological sustainability of cities and settlements," and Goal 9, "enhancing resource efficiency and modernizing industrial

of Azerbaijan (translation from Azerbaijani), May 3, 2021, Available at: https://president.az/az/articles/view/51355 (Accessed: June 27, 2024)

40 Azerbaijan Renewable Energy Agency under the Ministry of Energy of the Republic of Azerbaijan, *Green Energy Zone (GEZ) in the liberated territories*, 2021, Available at: https://area.gov.az/en/page/layiheler/yasil-enerji-zonasi/yasil (Accessed: June 27, 2024)

41 United Nations, *The 17 Goals*, 2024, Available at: https://sdgs.un.org/goals (Accessed: June 29, 2024)

production through the application of clean technologies".

To achieve the above-mentioned goals in the specified areas, the reconstruction process in the liberated territories is incorporating Smart Village and Smart City concepts. These innovative approaches could bring a multitude of benefits, including sustainable economic development, efficient resource utilization, and environmental protection. By integrating advanced technologies and intelligent systems, these concepts also enhance public services, improve the quality of life, and promote ecological balance.

One of the primary benefits of implementing smart technologies is the efficient use of available resources. Through advanced data analytics, monitoring, and optimization, cities and villages can better manage resources such as energy, water, and waste. This leads to sustainable economic development by reducing waste and lowering the environmental impact of human activities. Additionally, integrating smart technologies promotes environmental protection by enabling eco-friendly practices such as utilizing renewable energy sources, initiating waste recycling programmes, and creating green spaces. By focusing on sustainability, smart cities and villages support global efforts to combat climate change and ensure a healthier environment for their residents.

The inauguration of the first Smart Village took place in Aghali village in the Zangilan district of the liberated territories.[42] This initiative to establish a settlement based on the Smart Village model, launched in April 2021, achieved rapid completion; by July 2022, the first families had already resettled there.[43] The pilot project for Aghali village focused on five main components: housing, manufacturing, social services, 'smart agriculture', and alternative energy. Innovative building materials were used in the construction of 200 private homes in the village. Currently, 41 families, totalling 201 individuals, have relocated to Aghali in four successive stages.[44]

42 Trend.az, *The "Great Return" process was started with the opening of the first "Smart Village" project in Zangilan* (translation from Azerbaijani), May 28, 2022, Available at: https://az.trend.az/azerbaijan/politics/3601723.html (Accessed: June 29, 2024)

43 Trend.az, *Former IDP of Karabakh's Aghali village happy to return to native land*, August 12, 2023, Available at: https://en.trend.az/azerbaijan/society/3783533.htm (Accessed: June 29, 2024)

44 News.az, *Residents of Zengilan's Agalı village start to return to their homes today*, July 19, 2022, Available at: https://news.az/news/residents-of-zengilans-agali-village-start-to-return-to-their-homes-photo (Accessed: June 29, 2024)

Building on this success, the development of the next Smart Village is under way in Devletyarli village in Fuzuli district. These projects are part of a broader strategy to create sustainable, technologically advanced communities that enhance quality of life while promoting environmental stewardship. The Smart Village concept integrates modern infrastructure, efficient resource management, and eco-friendly practices, setting a benchmark for future developments in the region. Through these efforts, Azerbaijan is demonstrating a commitment to innovative reconstruction that aligns with global sustainability goals.

Among the primary factors impacting the environment are human economic activities such as agriculture and farming. Given that the liberated territories will host large agricultural farms and activities, it is crucial to minimize their environmental impact. To achieve this, Azerbaijan plans to implement smart agriculture and farming techniques in these areas as part of the Smart Village concept.[45] As a significant portion of the population is involved in farming, the use of smart agriculture is deemed essential for improving efficiency, boosting productivity, and promoting rapid development in the agricultural sector. Various aspects of smart agriculture are already being integrated into the smart villages established in these regions.

For example, the government of Azerbaijan is actively investing in the establishment of climate stations within smart villages.[46] These stations are critical as they electronically transmit vital information, such as soil conditions, air temperature, wind speed, and humidity, directly to farmers. This real-time data allows farmers to quickly assess the needs of their fields and identify potential risks, enabling immediate and precise interventions.

The initiative also includes scanners equipped with artificial intelligence and predictive analysis capabilities to efficiently manage various agricultural operations. These advanced tools help farmers make informed decisions, enhance crop yields, and reduce waste. Additionally, drone technologies are deployed for the timely detection

45 N. Baghirova. *Smart Farming for Sustainable Agriculture in Karabakh.* Institute for Development and Diplomacy. 6 November 2023, https://idd.zeroline.az/media/2023/11/07/summary_of_round_table_-_baghirova_6_november.pdf (Accessed: June 29, 2024)

46 Azernews.az, *Great Return in progress: Aghali village 1 year with new residents*, July 20, 2023, Available at: https://www.azernews.az/analysis/212498.html (Accessed: June 30, 2024)

of issues during crop cultivation.[47] Drones provide valuable insights, enabling proactive measures to address challenges in the fields before they escalate.

Furthermore, the widespread adoption of pivot irrigation systems is planned for implementation in smart villages.[48] These systems are designed to optimize water use and improve crop management, aligning with smart agriculture's broader goals of maximizing resource utilization and ensuring sustainability. By integrating these advanced technologies and practices, the smart villages aim to create a more resilient, productive, and environmentally friendly agricultural sector in the liberated territories.

Conclusion

The analysis in this article underscores Azerbaijan's strong commitment to fostering a more sustainable, eco-friendly, and environmentally conscious environment in the Garabagh region. Beyond merely addressing the environmental damage inflicted during the occupation, Azerbaijan is actively engaged in creating entirely new ecosystems that align with sustainable development objectives. This comprehensive approach encompasses various initiatives aimed at restoring environmental balance, such as combating deforestation, mitigating water pollution, and preserving habitats.

Moreover, Azerbaijan is pioneering efforts to transform the liberated territories into exemplars of sustainability by leveraging renewable energy sources. By tapping into the renewable energy potential of these areas, Azerbaijan seeks to bolster environmental sustainability while simultaneously establishing designated Green Energy Zones. This strategic move not only reduces dependence on fossil fuels but also fosters a cleaner, greener energy landscape.

In addition to energy-focused endeavours, Azerbaijan is integrating

47 Xalqcebhesi.az, *For the first time in Azerbaijan, drones will be used for fertilizer and seed sowing* (translation from Azerbaijani), June 9, 2021, Available at: https://www.xalqcebhesi.az/news/economy/79866.html (Accessed: June 30, 2024)

48 Oxu.az, *In Azerbaijan, the area of land where pivot irrigation is applied will be increased four times* (translation from Azerbaijani), January 26, 2023, Available at: https://oxu.az/iqtisadiyyat/azerbaycanda-pivot-suvarma-tetbiq-olunan-torpaqlarin-sahesi-dord-defe-artirilacaq (Accessed: June 30, 2024)

innovative concepts such as Smart Village and Smart City into its reconstruction efforts. By incorporating advanced technologies and intelligent systems, these initiatives aim to optimize resource utilization, enhance efficiency, and minimize environmental impact. Through the adoption of such forward-thinking approaches, Azerbaijan is poised to achieve its sustainable development goals while mitigating environmental degradation and ensuring a brighter, more eco-friendly future for the liberated territories.

Multilateral Diplomacy for Shaping the International Environmental Regime: Key Landmark Conferences and COP29 in Azerbaijan

Najiba Mustafayeva*

The development of the international environmental regime has been significantly influenced by multilateral diplomacy, with landmark conferences such as Stockholm (1972) and Rio de Janeiro (1992) establishing key norms and principles of international environmental law. The non-binding but impactful provisions of the Stockholm Declaration and Rio Declaration have been codified further in international environmental treaties that are characterized by a "framework approach" allowing for the use of general arrangements accompanied by dynamic implementation and adaptation through protocols and annexes. These treaties emphasize collective global responsibility while recognizing environmental protection as a common interest. Periodic Conferences of the Parties (COPs) under the UNFCCC exemplify the significance of multilateral diplomacy in advancing global environmental efforts. COP29, to be held in Azerbaijan in 2024, underscores the critical importance of such diplomacy in addressing pressing environmental challenges. This paper examines the role of multilateral diplomacy in shaping the international environmental regime and highlights the necessity of shared responsibility and collective efforts. It emphasizes the evolution of international environmental law and the importance of flexible, adaptive treaty frameworks in addressing global environmental problems.

Keywords: multilateral diplomacy, international environmental law, international treaties, legal obligations, shared responsibility, COP29, Azerbaijan

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Introduction

The development of the international environmental regime has been shaped significantly by the dynamics of multilateral diplomacy, particularly through landmark conferences such as those held in Stockholm in 1972 and Rio de Janeiro in 1992. These conferences resulted in the emergence of fundamental norms and principles of international environmental law. Despite the non-binding nature of the Stockholm Declaration on the Human Environment and the Rio Declaration on Environment and Development, they represent critical milestones in the evolution of international environmental law.

However, the main role in formalizing legally binding obligations for states belongs to international treaties, which provide a legal framework for consolidated actions in addressing global environmental challenges. A unique feature of multilateral environmental treaties is the so-called "framework approach", providing a dynamic structure for implementation and flexibility for adaptation over time through additional protocols or annexes.

Moreover, multilateral environmental treaties provide a regime in which there is a common interest of all states regarding environmental protection. This reflects that breaches of these obligations can lead to environmental harm affecting multiple states or the international community.

Such an approach stresses the global community's commitment to collective efforts to preserve the environment. Against this background, periodic conferences of all parties, which serve as main forums for negotiation, collaboration, and, to some extent, monitoring of undertaken measures, play a crucial role in shaping the international environmental regime and ensuring its responsiveness to emerging threats and challenges.

In this respect, one of the most significant events is the Conference of the Parties (COP) of the United Nations Framework Convention on Climate Change (UNFCCC). COPs exemplify the enduring relevance of multilateral diplomacy in advancing global environmental protection efforts through equal dialogue among engaged stakeholders.

COP29 is scheduled to be held in Azerbaijan this year, 2024. As the host state, Azerbaijan sees this conference as a significant opportunity

to demonstrate its commitment to environmental sustainability and the transition to a green economy.

This article examines the role of multilateral diplomacy in fostering the development of the international environmental regime and analyses the legal peculiarities of multinational environmental treaties. The special focus of this article is to explain the necessity of shared responsibility to address pressing environmental challenges through collective efforts of the international community to safeguard the environment, and the critical importance of multilateral diplomacy in achieving this goal is emphasized.

Role of multilateral diplomacy in the development of international environmental law

International environmental law has gradually evolved as a fragmented and unsystematic legal regime consisting of various legal developments, including judicial decisions, the unilateral practices of states, and treaty-making processes, has given rise to fundamental norms and principles in environmental protection.[1] The pivotal role in this process belongs to multilateral diplomacy, which involves negotiations and cooperation among multiple states or international organizations[2] on issues of common interest. Since multilateral diplomacy is "aimed at resolving international problems, creating frameworks for cooperation, and establishing international norms and agreements",[3] the main concepts of international environmental law have emerged within diplomatic negotiations.

These events provide a platform for states to collaborate on pressing environmental issues, thereby fostering a sense of shared responsibility and promoting the exchange of knowledge, resources, and best practices, as well as facilitating monitoring of undertaken measures. Additionally, they serve as forums for raising awareness, mobilizing public support, and consolidating actions at both national and international levels to effectively address environmental challenges in a timely fashion.

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1 G. Hernandez, *International Law*, (Oxford: Oxford University Press, 2019), p. 496.

2 P. Taylor, AJR, Groom, *International Institutions at work*, (St. Martin's; First Edition (January 1, 1988), p. 180.

3 G.*Berridge, A. James, A Dictionary of Diplomacy, (*Palgrave Macmillan, 2003), p. 86.

Furthermore, considering that holding individuals and businesses internationally accountable for environmental harm poses significant challenges to international environmental law, inviting them as active participants to global summits and conferences becomes crucial for fostering a wider dialogue, promoting transparency, and encouraging voluntary commitments to address environmental concerns. Empowering non-state actors to take ownership of their environmental impacts through active participation in multilateral initiatives can contribute to the ongoing process of gradual movement from corporate social responsibility towards the international legal accountability of private persons and multinational corporations.

Finally, the adoption of legal arrangements on environmental issues during world summits and conferences plays a crucial role in establishing a more robust and systematic framework for cooperation. These decisions serve as important benchmarks for progress and provide concrete goals and targets for governments, international organizations, businesses, and individuals in the area of environmental protection.

Thus, multilateral diplomacy, typically reflected through global conferences and summits, has significantly contributed to the development of the regime of international environmental protection. In this respect, two landmark conferences, held in Stockholm in 1972 and Rio de Janeiro in 1992, marked the beginning of the era of international environmental law.

Both conferences resulted in the adoption of historic declarations: the Stockholm Declaration on the Human Environment and the Rio Declaration on Environment and Development. Although these declarations are considered so-called "soft law" and, thus, do not entail legal obligations for states, they nonetheless serve as crucial milestones in the development of norms and principles of international environmental law. Hence, the 1972 Stockholm Declaration[4] envisages several non-binding yet profoundly impactful provisions that have been codified further in international treaties:

- the recognition of the linkage between environmental protection and human rights (Principle 1);

4 United Nations, "Stockholm Declaration and Action Plan for the Human Environment", available at: https://documents.un.org/doc/undoc/gen/nl7/300/05/pdf/nl730005.pdf?token=t5iO2OwItg5zfbzyZd&fe=true (accessed: March 21, 2024).

- the need to safeguard the environment for future generations (Principle 2);
- the acknowledgement that, while States have the sovereign right to exploit their resources, they have a "responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction" (Principle 21).[5]

The Stockholm Conference was also significant due to its Action Plan, which contained three main categories: "(a) Global Environmental Assessment Programme; (b) Environmental management activities; (c) International measures to support assessment and management activities carried out at the national and international levels".[6] This plan also played a pivotal role in the establishment of the United Nations Environment Programme (UNEP), a subsidiary body under the UN General Assembly. As the leading global authority on the environment, UNEP today cooperates with governments, NGOs, businesses, and UN entities to address humanity's most pressing environmental challenges – from restoring the ozone layer to protecting the world's seas and promoting a green, inclusive economy.[7]

A transition to a more holistic approach to the regime of environmental protection was made by the 1992 Rio Conference on Environment and Development. The Rio Conference and its final document, the Rio Declaration,[8] emphasized advancing the core principle of sustainable development. This principle stresses the indisputable linkage between environmental protection and economic, as well as social, development, advocating for the adoption of effective policies.

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5 G. Hernandez, *International Law*, (Oxford: Oxford University Press, 2019), p. 498; See also: J.N. Moore, and S. Mahmoudi (eds), *The Stockholm Declaration and Law of the Marine Environment*, (Nijhoff, 2003), p.53.

6 The United Nations, United Nations Conference on the Human Environment, 5-16 June 1972, Stockholm, Available at: https://www.un.org/en/conferences/environment/stockholm1972 (Accessed: May 30, 2024).

7 The United Nations Environment Programme, Available at: https://www.unep.org/who-we-are/about-us (Accessed: March 23, 2024).

8 United Nations, "Rio Declaration on Environment and Development", Annex I of the Report of the United Nations Conference on Environment and Development, UN Doc A/CONF.151/26 (Vol I), August 12, 1992, Available at: https://www.un.org/en/development/desa/population/migration/generalassembly/docs/globalcompact/A_CONF.151_26_Vol.I_Declaration.pdf (accessed: March 21, 2024).

The Rio Declaration was accompanied by an ambitious agenda known as Agenda 21, which encompassed a list of valuable recommendations aimed at establishing a collaborative framework within the international environmental regime.[9] These recommendations addressed various programme areas and objectives across different sectors, including mechanisms for technology transfer from developed to developing nations, the alleviation of poverty through sustainable development, and support for national strategies, along with policies to achieve these goals.[10]

Moreover, within the framework of this conference, two significant international treaties were adopted: the 1992 Framework Convention on Climate Change (UNFCCC) and the 1992 Convention on Biological Diversity (CBD).

Following the Rio 1992 conference, two subsequent conferences were held: the 2002 Johannesburg World Summit on Sustainable Development and the 2012 UN Conference on Sustainable Development (Rio+20). Rather than focusing on institution-building or legislative efforts, these conferences mainly aimed at advancing the objectives outlined in the Rio 1992 agreements.[11]

"Framework approach" of multilateral environmental treaties

International treaties are instrumental in establishing legally binding obligations for states within the international environmental regime. Notably, international environmental treaties are characterized by a legal peculiarity named a "framework approach";[12] that is, in comparison with classical international treaties, they allow the use of general principles and institutional arrangements, thereby providing a more dynamic and flexible regime for implementation.

Thus, framework treaties typically come with accompanying protocols or annexes that offer more specific standards of protection and sometimes even legally binding provisions. A renowned example of

9 Ibid.

10 G. Hernandez, *International Law*, (Oxford: Oxford University Press, 2019), p. 501.

11 Ibid.

12 See: C. Redgwell, "Multilateral Environmental Treaty-Making" (2000) in V. Gowlland-Debbas (ed), Multilateral Treaty-Making: The Current Status of Challenges to and Reforms Needed in the International Legislative Process (Nijhoff, 2000), pp.89-107.

such a framework convention is the 1992 United Nations Framework Convention on Climate Change (UNFCCC), which serves as the basis for subsequent agreements such as the 1997 Kyoto Protocol and the 2015 Paris Agreement.[13]

Another specific feature of international environmental treaties, also linked with multilateral diplomacy, is the non-reciprocal nature of the obligations arising from them. This refers to situations where the obligations imposed by a treaty on one state party are not directly contingent upon or equivalent to the obligations imposed on the other party or parties. In the context of environmental treaties, this non-reciprocity can manifest in the concept of "common but differentiated responsibilities". This principle acknowledges that, although all states are responsible for addressing global issues such as environmental protection, their responsibilities are not the same due to differing capacities and historical contributions to the problem.

For instance, Article 3(1) of the UNFCCC acknowledges the principle of common but differentiated responsibilities among states concerning climate change.[14] A further example is Article 6 of the 1992 Convention on Biological Diversity, which obliges states to introduce "as far as possible and as appropriate general measures for the conservation and sustainable use of biological diversity". Article 17 of this treaty prescribes the exchange of information, "from all publicly available sources, relevant to the conservation and sustainable use of biological diversity, taking into account the special needs of developing countries".[15]

One more distinguishing feature of multilateral environmental treaties lies in the consequences of a breach of obligations under these documents. That is, a violation of responsibilities could result in environmental harm to multiple states or the international community. This can be observed, for instance, in the above-mentioned Convention on Biological Diversity, which explicitly recognizes "the common

13 G. Hernandez, *International Law*, (Oxford: Oxford University Press, 2019), p. 502.

14 United Nations Climate Change, Framework Convention on Climate Change (1992), Available at: https://unfccc.int/process-and-meetings/what-is-the-united-nations-framework-convention-on-climate-change (Accessed: March 11, 2024).

15 United Nations, Convention on Biological Diversity, June 5, 1992, available at: https://www.un.org/en/observances/biological-diversity-day/convention (Accessed: April 10, 2024).

concern of humankind" in preserving such diversity.[16]

It can be argued that such an approach stems from the obligations *erga omnes parties*, i.e. obligations owed by a state "toward the international community as a whole".[17] These obligations are binding on all states, regardless of whether they are parties to a specific treaty or agreement. Consequently, a state could invoke the issue of responsibility under international law, even if it is not directly affected.[18]

It is noteworthy that this approach has further developed in international judicial practice, specifically in the landmark ICJ judgment in Whaling in the Antarctic *(Australia v Japan; New Zealand intervening)*.[19] Thus, Australia effectively initiated legal proceedings concerning Japan's Antarctic whaling practices, alleging a breach of its obligations under the Whaling Convention, despite not being faced with any direct harm. This development signifies a crucial milestone in the ongoing evolution of the international environmental regime and highlights the global community's commitment to environmental protection.

Finally, an advantageous aspect of the framework approach of multilateral environmental treaties is their capacity to adjust to changing scientific, technical, and other information. This flexibility is frequently achieved through periodic conferences of all parties (known as COPs)[20] that serve as crucial tools of multilateral diplomacy. They play a pivotal role in shaping the international environmental regime and ensuring that it remains responsive to emerging challenges and developments in the field.

COP29 in Azerbaijan: Fostering multilateral cooperation in addressing environmental challenges

The Conference of the Parties (COP) of the UNFCCC is one of the above-mentioned significant events that addresses global climate concerns. Each year, state parties to UNFCCC meet "to measure progress

16 *Ibid*.

17 Barcelona Traction Heat, Light, and Power Co. (*Belgium v Spain*), Second Phase, ICJ Reports,1970, p.3, para 33.

18 Obligation to Prosecute or Extradite (*Belgium v Senegal*), Judgement, ICJ Reports, 2012.

19 Whaling in the Antarctic *(Australia v Japan; New Zealand intervening),* Judgement, ICJ Reports 2014.

20 G. Hernandez, *International Law*, (Oxford: Oxford University Press, 2019), p. 502.

and negotiate multilateral responses to climate change". COPs have established significant benchmarks on a global scale for addressing climate change, setting standards, and promoting initiatives such as reducing carbon emissions, expediting the transition to sustainable energy sources, and aiding nations in adapting to and strengthening resilience against escalating climate challenges. These conferences play an important role in bringing together governments and diverse stakeholders, including businesses, civil society, and individuals, to collectively confront the urgent climate crisis.[21]

The convening of the COP29 conference stands out as the paramount event of 2024 for Azerbaijan, marking a significant milestone in the nation`s progression towards a green economy.

The first COP took place in Berlin, Germany, in 1995. The 28th COP convened in Dubai, United Arab Emirates, in 2023. During this gathering, the inaugural Global Stocktake occurred, enabling participating states to evaluate advancements made towards the objectives outlined in the Paris Agreement and to devise future strategies.[22]

The upcoming COP29 is scheduled to take place on November 11–22, 2024, in Baku, Azerbaijan. This highlights the continued importance of these international forums in fostering cooperation and united action towards addressing environmental challenges.

The convening of the COP29 conference stands out as the paramount event of 2024 for Azerbaijan, marking a significant milestone in the nation`s progression towards a green economy. Aligning with this strategic direction, Azerbaijan's President Ilham Aliyev issued an order declaring 2024 "Green World Solidarity Year" in Azerbaijan.[23]

Considering the tremendous importance of multilateral diplomacy in addressing environmental concerns, Azerbaijan seeks to foster global discussions on the ecological agenda, and advocate for sustainable development approaches. In this respect, President Aliyev mentioned that Azerbaijan will emphasize its status as an oil and gas nation while also highlighting to the international community its dedication to green

21 United Nations, UN Climate Change Conferences, Available at: https://www.un.org/en/climatechange/un-climate-conferences (Accessed: April 11, 2024).

22 *Ibid*.

23 Official website of the President of the Republic of Azerbaijan, *Decree of the President of the Republic of Azerbaijan on the declaration of 2024 as the "Year of Solidarity for the Green World" in the Republic of Azerbaijan*, December 25, 2023, Available at: https://president.az/az/articles/view/62737 (Accessed: April 12, 2024).

energy endeavours. "This commitment reflects a tangible reality, and the international community will once again witness our unwavering dedication to advancing the cause of green energy".[24]

It is worth noting that the initiative "Azerbaijan 2030: National Priorities for Socio-Economic Development",[25] approved by President Aliyev on February 2, 2021, lays down a strategic framework for renewable energy policies. Among its key priorities is a focus on promoting a clean environment and fostering green growth, thus signalling Azerbaijan's proactive approach towards transitioning to a green economy and aligning its efforts with international standards for greenhouse gas emissions.

As the host of COP29, Azerbaijan aims to prove its strong commitment to addressing global environmental challenges and driving the agenda for sustainable development. "We must break for good the stop-start of COP agreements so there is follow-through from one to the next", said Mukhtar Babayev, Azerbaijan's minister for ecology and natural resources and the president-designate of COP29. Against this background, he emphasized the initiation of "The COP Presidencies Troika",[26] heralding Azerbaijan's pivotal role as the conduit for decision-making and implementation between the leadership transitions from the 28th summit in the UAE to the 30th summit in Brazil next year. This ongoing mechanism aims to transform global summits from mere venues for grand announcements into platforms fostering continuity through diligent monitoring and implementation processes.[27]

As the host of COP29, Azerbaijan aims to prove its strong commitment to addressing global environmental challenges and driving the agenda for sustainable development.

24 Official website of the President of the Republic of Azerbaijan, *Ilham Aliyev chaired meeting regarding hosting of COP29 in Azerbaijan next* year, December 15, 2023, Available at: https://president.az/en/articles/view/62562 (Accessed: April 12, 2024).

25 Official website of the President of the Republic of Azerbaijan, *Order of the President of the Republic of Azerbaijan on approval of "Azerbaijan 2030: National Priorities for Socio-Economic Development"*, February 2, 2021, Available at: https://president.az/en/articles/view/50474 (Accessed: April 12, 2024).

26 COP28 UAE, "*COP28 launches 'The COP Presidencies Troika' in partnership with the COP29 and COP30 Presidencies-a groundbreaking initiative to support 'Mission 1.5°C' by maintaining momentum, locking in continuity, and anchoring implementation",* March 12, 2024, Available at: https://www.cop28.com/en/news/2024/02/COP28-launches-The-COP-Presidencies-Troika (Accessed: March 19, 2024).

27 The Guardian, *"As Cop29 president, I will build bridges between the diverging north and south to keep 1.5C in reach"*, Available at: https://www.theguardian.com/commentisfree/2024/mar/12/cop29-bridges-diverging-north-and-south-15c-in-reach (Accessed: April 13, 2024).

Thus, by facilitating dialogue and negotiation, COP29 targets, *inter alia*, the development of comprehensive agreements and strategies for sustainable development. In fact, through robust monitoring and implementation mechanisms, multilateral diplomacy ensures accountability and progress towards collective environmental goals, thus promoting a more resilient and structured international environmental regime.

Conclusion

The evolution of international environmental law has been marked by a journey from fragmentation to a more robust, but still unsystematic, legal regime. Through the efforts of multilateral diplomacy, particularly evident in landmark conferences such as Stockholm 1972 and Rio de Janeiro 1992, significant results have been achieved in establishing fundamental norms and principles for international environmental protection.

Moreover, global conferences and summits have emerged as crucial platforms for facilitating dialogue and fostering collaboration among states and various stakeholders, as well as mobilizing collective efforts towards a more systematic and effective international environmental regime. By engaging not only governments but also private entities and individuals, these forums promote a sense of shared responsibility and encourage commitments to environmental protection.

Meanwhile, international treaties play a crucial role in formalizing legal obligations for states, thus ensuring the continuity of environmental protection efforts across borders and over time. The distinct "framework approach" adopted by multilateral environmental treaties provides a dynamic structure for implementation that is characterized by general principles and flexible mechanisms for adjustment.

These framework treaties, exemplified by agreements such as the UNFCCC, establish broad principles while allowing for the development of more specific and legally binding standards through accompanying protocols or annexes. This flexibility enables adaptation to changing circumstances and scientific knowledge, thus ensuring the relevance and effectiveness of environmental agreements.

In addition, the multilateral treaty approach allows for differentiation in obligations among states based on their capacities and circumstances,

representing *ipso facto* ("by the fact itself") the principle of common but differentiated responsibilities.

Finally, the "framework approach" of multilateral environmental treaties facilitates adaptation to emerging challenges through periodic COPs. The COP of the UNFCCC stands as a pivotal event in the global effort to address climate change. These annual meetings serve as crucial platforms for measuring progress, negotiating multilateral responses, and setting benchmarks at a global scale.

As Azerbaijan prepares to host COP29 in 2024, the state's commitment to advancing environmental sustainability and green development is underscored. Hosting COP29 presents Azerbaijan with a unique opportunity to prove its dedication to addressing global environmental challenges and driving sustainable development.

To sum up, COP29 represents a milestone in Azerbaijan's efforts towards shaping the international environmental regime and underscores the importance of multilateral diplomacy in fostering collective action and progress towards more resilient and structured global environmental protection. By promoting comprehensive agreements and strategies for sustainable development, COP29 aims to pave the way for a green and more sustainable future for generations to come.

The Green Energy Corridor between the EU and the Caspian Sea: Potential and Challenges

Agha Bayramov*

This article investigates the Caspian–European Union Green Energy Corridor, a strategic initiative to bolster energy security and diversification in a tense geopolitical climate. The corridor hinges on large-scale renewable energy projects, like the Black Sea and Caspian Sea Electricity Cables, facilitating green energy exports from Azerbaijan, Kazakhstan, and Uzbekistan to Europe. These projects showcase the Caspian region's potential to contribute to global sustainability through wind, solar, and hydropower resources. However, substantial challenges, including geopolitical instability, technical hurdles, and significant investment needs, threaten the initiative's success. This article explores the current status, potential for, and obstacles to the Caspian Green Energy Corridor.

Keywords: Kazakhstan, Azerbaijan, Uzbekistan, The European Union, Renewable Energy, Green Corridor

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Introduction

Since the start of the war in Ukraine, the European Union has been seeking alternative sources for critical raw materials and renewable energy resources. Through its External Energy Engagement Strategy (EEES) and REPowerEU initiatives, the EU is dedicated to decreasing its reliance on Russian fossil fuels, forming sustainable energy partnerships, and fostering a worldwide transition to green energy. Among the regions that can meet these needs is the Caspian Sea, which boasts strong potential for renewable energy and has played a significant role in supplying oil and gas to the EU, particularly through Azerbaijan and Kazakhstan.

Similarly, countries in the South Caucasus and Central Asia have been investing in renewable energy sources and exploring avenues to export green energy to Europe.

Similarly, countries in the South Caucasus and Central Asia have been investing in renewable energy sources and exploring avenues to export green energy to Europe. This effort has seen the signing of several Memorandums of Understanding (MoU) between European and regional countries, as well as among the region's countries themselves. Noteworthy projects include the Black Sea Electricity Cable Project, the Green Hydrogen Project, and the Caspian Electricity Cable Project involving Azerbaijan, Kazakhstan, and Uzbekistan.

Furthermore, Azerbaijan is set to host the Conference of Parties 29 (COP29) in November 2024. In light of these developments, it can be argued that regional countries are investing in the Caspian Green Energy Corridor to make it a more viable reality. This article aims to explore the potential of the Caspian Green Energy Corridor, outline its main projects, and address potential challenges. More specifically, this article aims to answer the following questions: *What are the key projects currently underway in the Caspian Green Energy Corridor, and how do they aim to facilitate the export of green energy to Europe? What are the main challenges faced by the regional countries involved in the development of the Caspian Green Energy Corridor, and how are they being addressed?*

The Black Sea Submarine Cable Project

The Black Sea Submarine Cable Project, also known as the Caspian Sea–European Union Green Energy Corridor, is a significant initiative

to generate green energy from renewable sources in Azerbaijan and export the power to Europe via a subsea cable under the Black Sea.[1] The rationale for the project is that Azerbaijan has significant untapped potential for generating power from onshore and offshore wind farms along its Caspian Sea coast, as well as potential for solar generation.[2] Power generated could be transited across the Black Sea to countries in eastern and central Europe, which are heavily reliant on natural gas and coal.[3]

The concept has been under discussion for some years and was the subject of a World Bank methodology report in June 2020, which concluded that a subsea cable across the Black Sea would generate sufficient economic benefit to warrant further consideration.[4] In 2021, USAID and the United States Energy Association completed a technical assessment and concluded that, with minimal upgrades to the existing power transit grids of Georgia and Romania, the four countries are sufficiently robust to transfer up to 1,000 megawatts.[5]

The project took on a more formal structure on December 17, 2022, when Azerbaijan's President Ilham Aliyev, Georgia's Prime Minister Irakli Garibashvili, Romania's Prime Minister Nicolae Chuke, and Hungary's Prime Minister Viktor Orban signed a 'Strategic Partnership Agreement' committing them all to work together on the project.[6]The agreement was signed in the presence of Ursula von der Leyen, President

1 Staske, S. and Stubbe, R., "Prospects for the Black Sea Submarine Cable", *German Economic Team*, January-February 2024, Available at: https://www.german-economic-team.com/en/newsletter/prospects-for-the-black-sea-submarine-cable/ (Accessed: June 29, 2024).

2 Shah, R., "Bulgaria, Azerbaijan Announce Cable Project", *SubTel Forum*, March 4, 2024, Available at: https://subtelforum.com/bulgaria-azerbaijan-announce-cable-project/ (Accessed: June 29, 2024).

3 Kardaś, S., "Energising Eastern Europe: How the EU Can Enhance Energy Sovereignty Through Cooperation with Ukraine and Moldova", *European Council on Foreign Relations*, March 11, 2024, Available at: https://ecfr.eu/publication/energising-eastern-europe-how-the-eu-can-enhance-energy-sovereignty-through-cooperation-with-ukraine-and-moldova/ (Accessed: June 29, 2024).

4 O'Byrne, D., "Azerbaijan Positioning Itself as Green Energy Exporter", *Eurasianet*, August 9, 2023, Available at: https://eurasianet.org/azerbaijan-positioning-itself-as-green-energy-exporter (Accessed: June 29, 2024).

5 Euronews, *Von der Leyen Heads to Azerbaijan to Secure New Gas Import Deal*, July 18, 2022, Available at: https://www.euronews.com/my-europe/2022/07/18/von-der-leyen-heads-to-azerbaijan-to-secure-new-gas-import-deal (Accessed: June 29, 2024).

6 O'Byrne, *op.cit.*

of the European Commission, representing the European Union, which in July 2022 signed an MoU with Azerbaijan to provide assistance with Azerbaijan's renewable energy plan in return for official Baku agreeing to double gas exports to Europe by 2027.[7]

Meeting in Romania's capital, Bucharest, on July 25, 2023, officials from the four countries signed an MoU to establish a joint venture between their national electricity grid operators to coordinate activities and push ahead with the project.[8] The meeting was also attended by representatives of Bulgaria and the European Commission, both of which have expressed support for the venture.[9] The project agreed between the four states envisages the laying of a 1,200-kilometre cable with a capacity to carry 1,000 megawatts across the Black Sea between Georgia and Romania, as well as expanding the onshore capacities of existing transmission cables in the four countries involved. A fibre-optic cable would be laid alongside to strengthen Internet connectivity between the Caucasus and the EU.[10]

The European Union has also been supportive of the project. As Ursula von der Leyen, President of the European Commission, said at the signing of an MoU in December 2022, "*The project holds a lot of promises. Now it is up to us to deliver on the security of energy supply and on decarbonising our economies*."[11]

On April 5, 2024, during a joint EU–US–Armenia high-level meeting in Brussels, Ursula von der Leyen mentioned that "*we will invest in key infrastructure projects. For example, in the Black Sea electricity cable that is a new transmission route full of opportunities. It can notably bring clean, renewable energy into Europe. We are ready to support it. In parallel, we will continue investing in Armenia's renewable energy production and in better interconnections with Georgia*."[12] This

7 Euronews, "Von der Leyen Heads to Azerbaijan…", *op.cit.*

8 Interfax, *Azerbaijan, Georgia, Romania and Hungary Begin Process of Creating Joint Venture for Black Sea Energy Project*, May 29, 2024, Available at: https://interfax.com/newsroom/top-stories/102758/ (Accessed: June 29, 2024).

9 O'Byrne, *op.cit.*

10 Interfax, "Azerbaijan, Georgia, Romania and Hungary Begin Process…", *op.cit.*

11 European Commission, "Joint EU-US-Armenia High-Level Meeting Supports Armenia's Resilience", *European Commission*, February 2, 2022, Available at: https://ec.europa.eu/commission/presscorner/detail/en/statement_22_7807 (Accessed: June 29, 2024).

12 European Commission, "Joint EU-US-Armenia High-Level Meeting to Support

indicates that Armenia might also join the Black Sea electricity project in the future.

There is a general consensus that the proposed cable would enhance European security and benefit the economies of Azerbaijan, Georgia, and several central and southeastern European nations through which new or expanded transit lines would run. Nonetheless, numerous substantial challenges lie ahead.

Firstly, the Russia–Ukraine war has not only intensified the EU's efforts to secure additional sources of oil, gas, and electricity but has also severely impacted the safety of shipping in the Black Sea due to threats like free-floating mines.[13] The cable itself would be an easy target for potential saboteurs.

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The planned route of the cable would place it less than 150 km from the southern tip of Crimea, which is currently under the control of the Russian Federation, making it easily accessible to the Russian navy from both Crimea and Novorossiysk.[14] The sabotage of the Nord Stream pipeline in September 2022 highlighted the vulnerability of such large-scale infrastructure projects. Analysts in the Baltic region claim that Russia has developed specialized vessels capable of threatening underwater cables.[15] This creates a significant challenge in insuring the project at a feasible rate, without which few credible investors would be willing to provide funding.

In addition to these geopolitical risks, there is the formidable task of constructing the Black Sea Submarine Cable Project. The average depth

Armenia's Resilience", European Commission, April 5, 2024, Available at: https://neighbourhood-enlargement.ec.europa.eu/news/joint-eu-us-armenia-high-level-meeting-support-armenias-resilience-2024-04-05_en (Accessed: June 29, 2024).

13 International Maritime Organization (IMO), "Maritime Security and Safety in the Black Sea and Sea of Azov", Available at: https://www.imo.org/en/MediaCentre/HotTopics/Pages/MaritimeSecurityandSafetyintheBlackSeaandSeaofAzov.aspx (Accessed: June 29, 2024).

14 Gutbrod, H., "The Black Sea Submarine Cable Project: Update from Tbilisi", *German Economic Team*, May-June 2023, Available at: https://www.german-economic-team.com/en/newsletter/the-black-sea-submarine-cable-project-update-from-tbilisi/ (Accessed: June 29, 2024).

15 Kaushal, S., "Stalking the Seabed: How Russia Targets Critical Undersea Infrastructure", *Royal United Services Institute*, May 25, 2023, Available at: https://rusi.org/explore-our-research/publications/commentary/stalking-seabed-how-russia-targets-critical-undersea-infrastructure (Accessed: June 29, 2024).

of the Black Sea exceeds 1,000 metres, and recent incidents, such as the naval mine that washed ashore and exploded on a Georgian beach in February 2023[16] demonstrate the unpredictable dangers of the area. For approximately 700 km, the submarine cable would lie at around 2,000 meters below sea level, posing an extra challenge for any necessary repairs. Consequently, some experts believe that the project's cost could exceed the currently estimated €2.3 billion.[17]

Another major issue is whether the EU or other international funding bodies would be willing to finance or guarantee loans for the project.

Broader energy sector development is also a crucial factor. Will the region have enough energy to export by the early 2030s when the cable is expected to be completed? In Georgia, at least, there are doubts. The capacity of hydroelectric power plants (HPPs) in Georgia is up to 3,500 MW. In contrast, the total installed capacity of wind farms is only 21 MW, and solar power plants are not yet operational. Additionally, the construction of major reservoir HPPs, such as Khudoni, Nenskra, and Namakhvani, is currently suspended.[18] Furthermore, Kvaratskhelia and Mukhigulishvili argue that a significant portion of the Georgian population lives in energy poverty, meaning that they are unable to adequately heat their homes.[19] Domestic energy consumption is projected to grow faster than generation, and investors in the sector have faced numerous setbacks, including local resistance (mainly to HPP construction). For example, activists protested against the construction of the Namakhvani Hydropower Plant, leading to its suspension by the Georgian government. The protests highlighted significant environmental and social concerns, prompting the government to halt the project and engage in further discussions.[20] Although the government

16 The Maritime Executive, *Video: Floating Naval Mine Explodes on a Beach in Georgia*, February 14, 2023, Available at: https://maritime-executive.com/article/video-floating-naval-mine-explodes-on-a-beach-in-georgia (Accessed: June 29, 2024).

17 Gutbrod, *op.cit.*

18 Tutana Kvaratskhelia and Giorgi Mukhigulishvili, "Georgia's Energy Transition: Challenges and Opportunities," Heinrich Böll Foundation, March 2024, Available at: https://ge.boell.org/sites/default/files/2024-03/georgias_energy_transition_3.pdf (Accessed: June 29, 2024).

19 Kvaratskhelia, T., and Mukhigulishvili, G., "Georgia's Energy Transition: Challenges and Opportunities", *Heinrich Böll Foundation*, March 2024, Available at: https://ge.boell.org/sites/default/files/2024-03/georgias_energy_transition_3.pdf (Accessed: June 29, 2024).

20 Civil.ge, *Government Suspends Namakhvani HPP Construction Following Protests*,

has expressed eagerness for more energy generation, observers are still waiting for a significant acceleration in the sector.

The Caspian Sea Electricity Project

In line with the Black Sea Submarine Cable Project, another ambitious green energy initiative is the Caspian Sea Electricity Project involving Azerbaijan, Kazakhstan, and Uzbekistan. On May 2, 2024, the energy ministers of these three countries signed an MoU to explore their joint electricity export potential by harnessing primarily wind and solar power. The MoU that Azerbaijan signed with Kazakhstan and Uzbekistan builds on a 2023 agreement with the EU states, including Hungary and Romania, to export electrical power across the Black Sea via an underwater cable with a capacity of 1,000 megawatts.[21] According to Kazakhstan's Energy Minister Almassadam Satkaliyev, this agreement envisions the laying of a 'high-voltage cable' on the Caspian Sea's seabed, with technical specifications for the transmission line already developed.[22] Stkaliyev mentioned that the tripartite memo is a significant step towards interconnecting the energy grids of Azerbaijan, Kazakhstan, and Uzbekistan and linking their energy systems.[23] A proposed business model will be developed to establish international transmission corridors, addressing financing, revenue flow, ownership, and the sale of green energy to the European Union countries.[24]

The three countries have swiftly moved to advance this plan. Satkaliyev informed journalists that the EU has expressed an interest in purchasing clean electricity from the consortium.[25] A feasibility study is underway

June 9, 2021, Available at: https://civil.ge/archives/421830 (Accessed: June 29, 2024).

21 The Astana Times, *Kazakhstan, Azerbaijan, and Uzbekistan Sign Agreement on Energy Interconnection*, May 2, 2024, Available at: https://astanatimes.com/2024/05/kazakhstan-azerbaijan-and-uzbekistan-sign-agreement-on-energy-interconnection/ (Accessed: June 29, 2024).

22 Kucera, J., "Azerbaijan, Kazakhstan, and Uzbekistan Press Ahead with Ambitious Electricity Export Plan", *Eurasianet*, May 14, 2024, Available at: https://eurasianet.org/azerbaijan-kazakhstan-and-uzbekistan-press-ahead-with-ambitious-electricity-export-plan (Accessed: June 29, 2024).

23 The Astana Times, "Kazakhstan, Azerbaijan, and Uzbekistan Sign Agreement…", *op.cit.*

24 Kucera, *op.cit.*

25 The Astana Times, "Kazakhstan, Azerbaijan, and Uzbekistan Sign Agreement…", *op.cit.*

to detail construction and financing aspects, with preliminary estimates expected by the end of the year. However, it is still too early to determine the project's cost or the exact volume of power exports involved.[26]

The objective of exporting electricity to the EU aligns with the renewable energy expansion plans of Azerbaijan, Kazakhstan, and Uzbekistan. These countries aim to leverage their vast renewable energy resources, such as wind and solar, to generate clean electricity. For example, Azerbaijan is actively developing its renewable energy production to export green energy and increase gas supplies to Europe. Azerbaijan's President Ilham Aliyev highlighted that his country aims to produce more renewable energy than it needs domestically. The primary goal is to export this surplus while maximizing the use of renewables for electricity production. This strategy would allow Azerbaijan to save natural gas for export, particularly to European countries that currently have high demand for energy resources.[27] Uzbekistan, in particular, aims to generate an additional 20 gigawatts (GW) of renewable energy by 2030, raising the country's total renewable capacity to 27 GW. In April 2024, the government signed agreements with several international energy companies to develop wind and solar facilities projected to produce 12 GW and, in May, it entered contracts for another 6 GW.[28]

The objective of exporting electricity to the EU aligns with the renewable energy expansion plans of Azerbaijan, Kazakhstan, and Uzbekistan. These countries aim to leverage their vast renewable energy resources, such as wind and solar, to generate clean electricity.

The EU's previous experience with electricity trade agreements, such as that with Norway, provides a relevant model that could be applied to both the Caspian Sea and Black Sea regions. The existing electricity projects in operation illustrate the potential for similar initiatives to succeed in these new contexts.

For instance, several notable projects connecting Norway with other European countries are already in operation. The NorNed cable, with a

26 Kucera, *op.cit.*

27 Interfax, *Azerbaijan Developing Renewable Energy Production for Export to Europe*, June 24, 2023, Available at: https://interfax.com/newsroom/top-stories/103638/ (Accessed: June 29, 2024).

28 Gazeta.uz, *Uzbekistan podpisal kontrakty na stroitelstvo solnechnykh i vetrovykh elektrostantsiy na 12 GVt*, May 6, 2024, Available at: https://www.gazeta.uz/ru/2024/05/06/investments/ (Accessed: June 29, 2024).

capacity of 700 MW, links Norway to the Netherlands. The NordLink cable connects Norway to Germany and boasts a capacity of 1,400 MW, while the North Sea Link (NSL), also with a capacity of 1,400 MW, connects Norway to Great Britain.[29] All these projects use direct current (DC) technology and are currently operational.

Kazakhstan and Azerbaijan are poised to play a facilitating role in the power export arrangement. Kazakhstan's renewable goals are relatively modest compared to Uzbekistan's. Kazakhstan currently generates about 2.9 GW of power from renewable sources and aims to add at least another 5 GW by 2030, according to Energy Minister Almassadam Satkaliyev.[30] Much of this capacity may be needed domestically, as Kazakhstan faced a power deficit in 2023 that turned it into a net importer of electricity.[31]

Azerbaijan, while having high potential for renewable energy sources, does not yet fully employ its renewable potential in domestic energy production or consumption. Azerbaijan's technical potential for onshore renewable energy is 135 GW, and its offshore potential is 157 GW. The economic potential is estimated at 27 GW, including 3,000 MW of wind energy, 23,000 MW of solar energy, 380 MW of bioenergy, and 520 MW from mountain rivers.[32] To diversify its energy consumption and exports, Azerbaijan targets generating 5 GW of solar and wind power by 2030. Relevant laws and normative legal acts have been adopted to develop the renewable energy sector, including the law on renewable energy sources approved in 2021. In 2023, renewable energy accounted for 7% of Azerbaijan's total electricity production.[33] In other words, Azerbaijan remains significantly dependent on natural gas, which provides over 90% of its electricity.

29 TenneT, *NorNed*, Available at: https://www.tennet.eu/projects/norned (Accessed: June 29, 2024).

30 Prime Minister of the Republic of Kazakhstan, *Ministry of Energy works out measures plan for electric power industry development. 26 GW of new generating capacities to be commissioned*, January 16, 2024, Available at: https://primeminister.kz/en/news/ministry-of-energy-works-out-measures-plan-for-electric-power-industry-development-26-gw-of-new-generating-capacities-to-be-commissioned-26978 (Accessed: June 29, 2024).

31 Kucera, *op.cit.*

32 Ministry of Energy of Azerbaijan, *The Use of Renewable Energy Resources in Azerbaijan*, March 6, 2024, Available at: https://minenergy.gov.az/en/alternativ-ve-berpa-olunan-enerji/azerbaycanda-berpa-olunan-enerji-menbelerinden-istifade (Accessed: June 29, 2024).

33 Ministry of Energy of Azerbaijan, "The Use of Renewable Energy…", *op.cit.*

Similarly, Kazakhstan aims to generate 15% of its electricity from renewable energy sources by 2030, excluding large hydropower.

However, several challenges need to be addressed. Customer preference for renewable energy over fossil fuels should be increased in Azerbaijan, Kazakhstan, and Uzbekistan. This can be achieved by providing tax incentives or subsidy measures to make renewable energy more attractive to the public. Public awareness of the benefits of transitioning away from fossil fuels needs to be enhanced to expand the deployment of renewables. Additionally, both Azerbaijan and Kazakhstan have significant fossil fuel subsidy systems that make renewable energy investments less attractive by keeping fossil fuel prices artificially low.[34] According to a World Bank report, from 2016–2021, explicit energy subsidies averaged US$2.3 billion, or 5.1 per cent of GDP, in Azerbaijan.[35] On the other hand, Kazakhstan's fossil fuel subsidies amounted to approximately 6% of its 2021 GDP, placing it among the top 25 countries in terms of the magnitude of such subsidies.[36]

Kazakhstan plans to invest 50 billion tenge ($110.7 million) in renewable energy in 2024.[37] This includes nine billion tenge ($19.9 million) for wind power stations, 13 billion tenge ($28.7 million) for solar power stations, and 28 billion tenge ($62 million) for hydroelectric power stations.[38] Renewable energy capacity in Kazakhstan has shown steady growth, increasing over 16 times from 178 MW in 2014 to 2,868 MW in 2023.[39] In 2023, renewable energy facilities generated 6.675 billion kilowatt-hours (KWh) of electricity, accounting for 5.92% of total electricity

34 International Energy Agency, "Energy Efficiency Policy in Azerbaijan: A Roadmap", 2023, Available at: https://origin.iea.org/reports/energy-efficiency-policy-in-azerbaijan-a-roadmap/setting-the-scene-energy-efficiency-in-azerbaijan (Accessed: June 29, 2024).

35 World Bank, "Project Information Document (PID): Concept Stage - P179048", 2023, Available at: https://documents1.worldbank.org/curated/en/099112723161524095/pdf/P17904806938f5083093a707fa0352e87a5.pdf (Accessed: June 29, 2024).

36 World Bank, "Empowering the Future of Kazakhstan's Energy Sector", January 5, 2024, Available at: https://www.worldbank.org/en/news/feature/2024/01/05/empowering-the-future-of-kazakhstans-energy-sector (Accessed: June 29, 2024).

37 Nakispekova, A., "Kazakhstan to Allocate Over $110 Million Investment in Renewable Energy in 2024", *Astana Times,* February 26, 2024, Available at: https://astanatimes.com/2024/02/kazakhstan-to-allocate-over-110-million-investment-in-renewable-energy-in-2024 (Accessed: June 29, 2024).

38 Nakispekova, *op.cit.*

39 *Ibid.*

production.[40] When large hydroelectric power stations are included, this figure reached 13.7%. To achieve a 15% share of renewable energy by 2030 and 50% by 2050, Kazakhstan plans to conduct annual auctions and implement large-scale projects with strategic investors.

Uzbekistan is also making significant strides in renewable energy. Uzbekistan's Minister of Energy, Zhurabek Mirzamakhmudov, announced plans to increase the share of renewable energy in power production at Energy Week (UEW 2024) in Tashkent on May 14, 2024.[41] The goal is to achieve an 18% share of renewable energy by the end of the year and 40% by 2030, primarily from solar and wind energy.[42] By 2030, Uzbekistan plans to operate 25 GW of solar and wind power plants. In 2023, new installed capacity enabled Uzbekistan to reach 18% solar and wind generation during the daytime. By the end of the year, the country aims to commission 2,000 MW of solar power plants, 600 MW of wind power stations, and 300 MW of energy storage systems.[43]

The next phase of Uzbekistan's energy reforms will focus on attracting private investors into the electricity distribution grid and doubling energy efficiency. Uzbekistan, along with Azerbaijan and Kazakhstan, plans to export green energy to Europe, including Hungary and Romania. Uzbekistan plans to increase the volume of its green energy production to 13 billion kWh by 2024, aiming for a 15% share in the country's overall energy balance.[44]

At a meeting in February, Uzbekistan's President Shavkat Mirziyoyev expressed dissatisfaction with the pace of alternative energy projects and ordered the expedited launch of 14 solar and wind power plants and the initiation of two pumped storage station projects.[45] This underscores the urgent need for reform and investment to meet the ambitious renewable energy targets set by Uzbekistan, Azerbaijan, and Kazakhstan.

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40 *Ibid.*

41 Tashkent Times, *Share of Uzbekistan Renewable Energy Sources Will Reach 18% by the End of 2024, Says Energy Minister*, June 25, 2024, Available at: https://tashkenttimes.uz/national/12987-share-of-uzbekistan-renewable-energy-sources-will-reach-18-by-the-end-of-2024-says-energy-minister (Accessed: June 29, 2024) .

42 Tashkent Times, *Share of Uzbekistan Renewable Energy Sources…*, *op.cit.*

43 *Ibid.*

44 *Ibid.*

45 Tashkent Times, *Share of Uzbekistan Renewable Energy Sources…*, *op.cit.*

The Case of Green Hydrogen

Finally, the third ambitious green megaproject is the hydrogen production initiative by Kazakhstan and Azerbaijan. Both are exploring the potential of green hydrogen as part of their broader efforts to diversify energy sources and meet global sustainability goals. By leveraging their abundant renewable energy resources, both countries aim to produce green hydrogen, which can be used domestically and exported to international markets.

Although Azerbaijan has mentioned its green hydrogen intention,[46] it has not announced any projects yet. Azerbaijan, Kazakhstan, and Uzbekistan are actively investigating the potential of green hydrogen within their strategic frameworks for energy diversification. This initiative is part of their commitment to enhancing energy security and aligning with global sustainability objectives. Nevertheless, Kazakhstan, a pivotal energy player in the region, is embarking on ambitious plans to emerge as a major exporter of hydrogen energy. In October 2022, in the presence of President of Kazakhstan Kassym-Jomart Tokayev and President of the European Council Charles Michel, representatives of SVEVIND Energy Group and the Government of Kazakhstan signed a green hydrogen deal in Astana.[47] The final investment decision for this project, worth around US$40–50 billion, will be made in 2026.[48] Subsequently, in November 2022, at COP27 in Egypt, the European Union signed an MoU with Kazakhstan on cooperation on green hydrogen and critical raw materials.[49]

Leveraging the country's abundant solar and wind resources, the Hyrasia project aims to produce 2 million tons of green hydrogen annually by 2032, capitalizing on Kazakhstan's extensive expertise in the energy

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46 COP29 Azerbaijan, *Green Hydrogen*, Available at: https://cop29.az/en/pages/green-hydrogen (Accessed: June 29, 2024).

47 Bayramov, A., "Kazakhstan Has to Balance Its Green Hydrogen Mega-Project with Domestic and Ecological Constraints", *Commonspace*, May 2024, Available at: https://www.commonspace.eu/analysis/analysis-kazakhstan-has-balance-its-green-hydrogen-mega-project-domestic-and-ecological (Accessed: June 29, 2024).

48 Hyrasia One, *Hyrasia One Press Release*, April 2024, Available at: https://hyrasia.one/wp-content/uploads/2024/04/221027_press-release_IA_HYRASIA-ONE.pdf (Accessed: June 29, 2024).

49 European Commission, "Strategic Partnership between the European Union and Kazakhstan on Sustainable Raw Materials, Batteries and Renewable Hydrogen Value Chains", November 8, 2022, Available at: https://single-market-economy.ec.europa.eu/news/strategic-partnership-between-european-union-and-kazakhstan-sustainable-raw-materials-batteries-and-2022-11-08_en (Accessed: June 29, 2024)

sector.[50] However, transitioning to hydrogen energy in the Caspian Sea region presents several challenges. How can Kazakhstan bring green hydrogen to Europe? And what are the potential challenges?

The Hyrasia One Hydrogen Project

The Hyrasia One Hydrogen Project, to be located in Kazakhstan's Mangystau region, will use electricity from solar panels and wind turbines to produce 2 million tons of hydrogen annually by 2032, with production beginning in 2030.[51] Founded by Wolfgang Kropp and headquartered in Dresden, Germany, the project will install millions of solar panels and thousands of wind turbines in the vast steppes of southwestern Kazakhstan, generating about 40 gigawatts of renewable electricity.[52] This energy will be transported to a location near Kazakhstan's coastal city of Kuryk to produce green hydrogen via water electrolysis in a process known as power-to-gas. According to the SVEVIND Energy Group, hydrogen from the project can be used locally in Kazakhstan, for steel and aluminium production, or exported to European markets.[53]

However, several limitations hinder the deployment of hydrogen energy in Kazakhstan and Azerbaijan, including (1) the need for research and development (R&D) investment to decrease technology costs and build local capacity, (2) environmental issues, (3) lack of domestic demand, and (4) transport issues.

Domestic awareness

The lack of domestic demand for green hydrogen is a significant issue. Currently, Kazakhstan primarily uses unabated hydrogen in its three refineries (located in Atyrau, Pavlodar, and Shymkent) and as a feedstock for ammonia production in the fertilizer industry.[54] In this regard, local

50 Hyrasia One, *The Project*, accessed July 1, 2024, Available at: https://hyrasia.one/the-project (Accessed: June 29, 2024)

51 Hyrasia One, *The Project*, *op.cit.*

52 *Ibid.*

53 Energy Connects, "Svevind to Build World's Largest Green Hydrogen Plant in Kazakhstan", *Energy Connects*, June 27, 2021, Available at: https://www.energyconnects.com/news/renewables/2021/june/svevind-to-build-world-s-largest-green-hydrogen-plan-in-kazakhstan/ (Accessed: June 29, 2024).

54 Konrad Adenauer Stiftung (KAS), „EU-Kazakhstan Green Hydrogen Partnership", November 7, 2023, Available at: https://www.kas.de/documents/d/guest/eu-kazakhstan-

private actors' readiness to invest in green hydrogen technologies currently remains low.

Limited R&D

Although there are a limited number of small-scale ongoing demonstration projects, including the First Molecule project implemented by the Kazakh company Green Spark Limited, there is insufficient local R&D. Studies report that, at the domestic level, there is widespread unawareness in Kazakhstan regarding the transformative potential of green hydrogen or its practical applications that would benefit local communities.[55]

Water scarcity

In essence, initiating a green hydrogen economy in Kazakhstan will inevitably lead to an increase in water consumption, as water is the key component in green hydrogen production. However, water scarcity is a major concern in Kazakhstan, particularly in the southern and western regions, where the population heavily relies on irrigation for agriculture.[56] According to the UNEP, by 2040 the country may face significant shortfalls, amounting to 50 per cent of its needs.[57] Kazakhstan has eight water basins, seven of which lie in transboundary territories. More than 44 per cent of Kazakhstan's river flow originates on the territory of other countries, so the deficit will arise primarily due to intensive water use in neighbouring countries.[58]

Given the impending challenge of water scarcity in the country, careful analysis of the water balance must be carried out by clearly outlining how much water would be consumed by each sector. Developing hydrogen energy may be achieved at the cost of water security, which is an undesirable outcome.

Furthermore, the Aral Sea crisis, a significant ecological disaster that resulted from the diversion of rivers for irrigation purposes, had a severe

green-hydrogen-partnership (Accessed: June 29, 2024).

55 *Ibid.*

56 *Ibid.*

57 United Nations Development Programme (UNDP), "The Climate Change Impact on Water Resources in Kazakhstan", October 26, 2021, Available at: https://www.undp.org/kazakhstan/stories/climate-change-impact-water-resources-kazakhstan (Accessed: June 29, 2024).

58 *Ibid.*

impact on the country's water resources. Rural areas face challenges in terms of accessing clean water and adequate sanitation facilities. In addition, the Ural River's levels have been decreasing since the 1970s.[59]

Agriculture is the largest consumer of water. Heavy irrigation is essential for crop cultivation because of the vast arid and semi-arid regions.

Moreover, the falling level of the Caspian Sea is a sign of a critical situation that requires immediate action. The rate at which the sea level is falling has accelerated in recent years. For example, the average rate of decline over the past three years is about 23.3 cm a year. In June 2023, the local Aktau authority declared a state of emergency over the critically low level of the sea.[60] A green hydrogen economy will exert further stress on water capacity, highlighting the need to prioritise water in Kazakhstan's environmental management policies.

Transport challenges

Because of its landlocked geography, Kazakhstan faces limited options for exporting green hydrogen or ammonia to Europe. One option is to construct hydrogen pipelines across the Caspian Sea, the Caucasus, and Türkiye to reach southern Europe. The marine transport industry is represented on the Caspian Sea by the ports of Aktau, Kuryk, and Bautino. Transit shipping in the Caspian Sea includes routes from Aktau to Baku (475 km), Turkmenbashi (550 km), and Bandar Anzeli (700 km).[61]

Recently, the volume of transportation along this corridor has increased by 86% to reach 2.8 million tons, up from 1.5 million tons in 2022. This is a substantial increase compared to just 586,000 tons in 2021.[62] Nevertheless, the transport capacity of Kazakhstan's ports is currently limited. Additionally, hydrogen transport via the Caspian Sea would not directly reach target export destinations, but only transit countries such as Azerbaijan, the Russian Federation, and Iran. Furthermore, it needs to be transported via terrestrial transportation modes such as pipeline, railway,

59 KAS, „EU-Kazakhstan Green Hydrogen Partnership", *op.cit.*

60 UNDP, "The Climate Change Impact on Water Resources in Kazakhstan", *op.cit.*

61 CAREC Institute, "Ports and Logistics Scoping Study in CAREC", Volume II, 2021, Available at: https://www.carecprogram.org/uploads/Ports-and-Logistics-Scoping-Study-in-CAREC-Vol-II_4th-proof.pdf (Accessed: June 29, 2024)

62 Nakispekova, A., "Kazakhstan to Allocate Over $110 Million Investment in Renewable Energy in 2024", *Astana Times,* February 26, 2024, Available at: https://astanatimes.com/2024/02/kazakhstan-to-allocate-over-110-million-investment-in-renewable-energy-in-2024 (Accessed: June 29, 2024).

or truck. Additionally, because of the Russian invasion of Ukraine, using Russia as a transit route to the EU is no longer feasible.

Conclusion

Despite significant investments and ambitious goals in renewable energy, Azerbaijan, Kazakhstan, and Uzbekistan face substantial challenges in their transition away from hydrocarbons. Azerbaijan remains heavily reliant on natural gas for over 90% of its electricity, which could hinder its renewable energy targets.[63] Kazakhstan, while advancing its renewable capacity, still grapples with a domestic power deficit and modest renewable goals compared to Uzbekistan. Uzbekistan has set ambitious targets, but achieving these will require overcoming significant financial and infrastructural hurdles. Despite this, considering the green megaprojects described, it can be argued that Azerbaijan, Kazakhstan, and Uzbekistan are exploring the potential of green hydrogen as part of their broader efforts to diversify energy sources and meet global sustainability goals.

Furthermore, there is a heavy reliance on international expertise and technology, which limits the development of domestic capabilities. Public awareness of and preference for renewable energy remain low, necessitating enhanced education and workforce development programmes. Financial and regulatory environments need to be improved to attract private investment and make renewable energy technologies more affordable and sustainable.

The focus on large-scale projects might also overlook the potential benefits of smaller, community-based initiatives. Moreover, while the exploration of green hydrogen is innovative, it remains in its nascent stages globally, presenting high costs and technological challenges.

Overall, while these nations are making strides towards integrating renewable energy, a more diversified approach, enhanced local expertise, improved public awareness, and a supportive investment climate are crucial for achieving a sustainable energy transition.

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63 Ministry of Energy of Azerbaijan, *The Use of Renewable Energy Resources in Azerbaijan*, March 6, 2024, Available at: https://minenergy.gov.az/en/alternativ-ve-berpa-olunan-enerji/azerbaycanda-berpa-olunan-enerji-menbelerinden-istifade (Accessed: June 29, 2024).

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