Absheron Peninsula

In recent times, significant progress has been made in addressing environmental issues in our country. Azerbaijan is playing a role in combating climate change. Efforts are being made by the authorities to enhance the environment, restore and expand green spaces, and ensure the efficient utilization of water resources. Various projects and state programs aimed at environmental protection are being implemented, including the construction of forest belts and partial resolution of the drinking water problem. During a recent Cabinet of Ministers meeting discussing the results of the first nine months of 2018 and future tasks, President Ilham Aliyev highlighted ongoing efforts to improve the country's environmental situation: "Work is under way and analysis is being done to improve the environmental situation in our country. First of all, oil-polluted areas are being cleaned. The Ministry of Ecology and Natural Resources has received appropriate instruction and funds. Oil-polluted places on the Absheron Peninsula will be cleaned, parks and lakes will be created in these places and landscaping will be carried out. This work is under way and is planned for next year too. We are also working to create new sewage treatment plants on the Caspian coast."

The environmental issue is always in the centre of attention of the head of our state. Due to the concentration of about 40% of the population and 70% of industrial potential on the Absheron Peninsula, most environmental problems in the country are found in this area.

The main environmental problems are caused by the long-term pollution of the soil with oil and associated water from oil and gas production and drilling, the creation of polluted artificial lakes and reservoirs due to mismanagement of associated water, and the accumulation of waste from oil refining. Various pollutants such as oil products, suspended solids, sulphate compounds, chloride salts, surface active substances, phenols, and heavy metals are discharged into water bodies along with wastewater.

Soil contamination is a major issue on the Absheron Peninsula. Out of the total area of 222,000 hectares, 33,300 hectares of land remain unused, with 10,000 hectares being polluted by oil. The State Oil Company of the Azerbaijan Republic owns 7,500 hectares of oil-polluted lands, with 2,800 hectares being more heavily polluted. The level of soil contamination ranges from 12% to 30-40%, and the depth of contamination is 2 to 3 meters or more.

The Absheron economic district, located in the eastern part of the country, includes the administrative territories of Absheron, Khizi, and Sumgayit. Encompassing a total area of 381,776 hectares, which is 4.4% of the country's landmass, it is considered one of the most developed economic regions in the country. The district is bordered by Guba-Khachmaz economic district to the northwest, Mountainous Shirvan economic

district to the west, and Aran economic district to the southwest. It is surrounded by the Caspian Sea on the north, east, and south, enhancing its transport connectivity.

Another of the most serious environmental problems of Baku city and Absheron peninsula is related to solid waste utilization. Air pollution is a major concern in Baku, primarily due to the increasing number of vehicles and the lack of proper gas cleaning and dust collection devices. This results in harmful substances being emitted into the air, along with an increase in pollutants from waste incineration, which poses a significant threat to both the environment and human health. The Absheron peninsula is home to over 200 lakes, covering a total area of approximately 3,325 hectares. These lakes receive 41.5 million cubic meters of wastewater annually, leading to land degradation, salinization, and flooding of surrounding areas. Additionally, evaporation from these lakes releases hydrocarbons and other harmful substances into the atmosphere, causing damage to nearby settlements, businesses, and infrastructure. Some residential areas do not have proper sewerage systems, resulting in the discharge of domestic wastewater into the lakes and further worsening the environmental situation. The most oil and oil products polluted areas of Absheron are located in Garadagh, Binagadi, Sabunchu, Surakhani, Azizbeyov and Sabayil districts. Furthermore, there are 142,300 tonnes of oily sludge produced by oil and gas companies being stored within their facilities. The remaining districts of Absheron are considered to be ecologically favourable.

International Day of the Caspian Sea is an environmental date celebrated on August 12 by five Caspian states: Azerbaijan, Iran, Kazakhstan, Russia and Turkmenistan. The Framework Convention for the Protection of the Marine Environment of the Caspian Sea, also known as the “Tehran Convention”, was adopted in the city of Tehran in 2003. The main purpose of the “Caspian Day” is to implement measures to protect the marine environment of the Caspian Sea from pollution, to preserve, restore, sustainably and rationally use the sea's bioresources, and to educate the population in this direction.

In Azerbaijan, “Caspian Day” is commemorated with events, meetings, as well as efforts on cleaning and improvement of coastal areas. Local government employees, municipalities, NGOs, enterprises and organizations and Ministry of Ecology and Natural Resources entities participate in these events. Each year, initiatives are undertaken to clear the shoreline of plastic and other waste, which is then processed for recycling.

The Caspian Sea is the largest enclosed body of water on Earth, collecting up to 45 percent of the water from lakes worldwide and being isolated from the world ocean. The water supply of the Caspian Sea is primarily from the Volga River (80 percent), followed by the Kura River (6 percent), the Ural River (5 percent), and other smaller rivers like the Terek, Sulag, Samur, and those flowing in from Iran.

Amidst the intense oil and gas activities in the Caspian Sea, there are various geo-ecological threats such as fluctuations in sea level, geological risks from seabed deformations, and pollution-related environmental issues. Preserving the diverse biological resources in the Caspian Sea is a pressing issue that needs to be addressed comprehensively. It is believed that a scientific solution to these challenges relies on collaborative research among the Caspian littoral states, according to experts.

According to Academician Fakhraddin Gadirov, the Caspian region has experienced numerous geodynamic processes and interactions between lithospheric plates throughout its geological development. Previous studies have demonstrated significant fluctuations in the sea level of the Caspian Sea. Research has revealed that a century ago, the Caspian Sea's level was two meters higher than it is now, with a 1.5-meter drop in the 1930s followed by a 2.7-meter rise between 1978 and 1995. Since 2005, the sea level has been decreasing by 10 centimeters annually. If this trend continues for the next 25-30 years, the northeastern part of the Caspian Sea could face a fate similar to that of the Aral Sea. Despite certain time intervals showing trends in sea level changes, fluctuations are still observed.

The level regime of the Caspian Sea is greatly influenced by its geographical location and the rivers, precipitation, and evaporation that impact its water balance due to its lack of connection to the oceans. Over time, these factors contribute to changes in the sea's water balance.

Experts anticipate that the primary concern in the environmental and socio-economic agenda for the Caspian region in the future will be the ongoing decrease in the Caspian Sea's water level. The natural cycle of water level fluctuation, typical of the Caspian Sea, has been significantly impacted by both global climate change and human activities.

Azerbaijan is the only country among the Caspian littoral states that is actively taking steps to clean up the sea and its surrounding areas from pollution. It is expected that these ongoing efforts will result in a cleaner Caspian Sea and potentially remove the Absheron Peninsula from the list of pollution sources. The Ministry of Ecology and Natural Resources developed a project called "Improving the ecological condition of lakes and other bodies of water on the Absheron Peninsula" to address environmental issues in the region.

Significant progress has been made in creating new forest zones and clearing land in Absheron in recent years. The President has announced plans to plant millions of new trees in Baku and the Absheron Peninsula. He has also emphasized the importance of promoting olive cultivation and has instructed for the planting of new olive groves, providing irrigation and organizing olive oil production.

The continuous planting and care of seedlings indicate a promising future for olive cultivation in Azerbaijan. The country is now planting three times more olive trees compared to Soviet times. Agro-gardens with olive, almond, pomegranate, and mulberry trees have been planted on 35 hectares of land in Azerbaijan. In recent years, these activities have undergone further development and acquired a more systematic character.

In July 2022, an international conference dedicated to fluctuations in the level of the Caspian Sea under conditions of climate change was held in the city of Baku. Within the framework of the conference, issues related to the adaptation of coastal territories and the development of coordinated regional measures were discussed.

During 2023-2024, efforts to remediate oil-contaminated territories on the Absheron Peninsula continued, including sites previously withdrawn from economic use. At the same time, projects aimed at land reclamation and the restoration of natural landscapes were implemented.

In 2024, as part of environmental initiatives dedicated to Caspian Sea Day, large-scale coastal clean-up campaigns were conducted with the participation of governmental institutions, public organizations, and volunteers. Particular attention was devoted to the collection of plastic waste and its subsequent recycling.

Furthermore, in recent years, increasing attention has been directed toward the ecological condition of the Baku Bay. As a result of the declining water level of the Caspian Sea, previously submerged territories have become exposed, revealing metal structures, remnants of hydraulic engineering facilities, and areas contaminated with petroleum products. This has necessitated additional assessments and the development of comprehensive measures for their remediation and safe dismantling.

In 2025, during a meeting of the Cabinet of Ministers of the Republic of Azerbaijan, the “Comprehensive Action Plan for 2025-2030” aimed at improving the ecological condition of the Caspian Sea and adjacent coastal territories was approved. The document provides for the elimination and isolation of unsafe hydraulic engineering facilities, the dismantling of obsolete oil infrastructure, the recovery of sunken and partially submerged vessels, as well as the cleaning of the water area from oil pollution and household waste.

Within the framework of this plan, particular attention is devoted to Baku Bay and the territory of the Seaside Boulevard, where the retreat of the sea has exposed areas with high levels of pollution. Measures are planned for their remediation, land reclamation, and subsequent landscaping and improvement. In addition, measures are being developed and implemented to prevent the discharge of untreated wastewater into water bodies, modernize wastewater treatment facilities, and improve waste management systems.

Thus, in recent years, environmental policy on the Absheron Peninsula has been characterized by a transition from isolated local measures to a comprehensive approach aimed at addressing accumulated environmental problems, with the objective of achieving sustainable improvement in the region’s environmental condition.

Rehabilitation Project of Absheron Lakes

The inaugural European Games were hosted in Baku in 2015, marking one of the major global events of the year. Spectators and visitors to the Olympic Stadium, the primary venue for various competitions and the Games' opening and closing ceremonies, were impressed not only by the stadium itself, but also by the beauty of the surrounding areas. The area, previously considered to be an environmental disaster zone, now boasts a picturesque lake, boulevard, park, green spaces, inclusive sports facilities, and playgrounds.

This transformation was a result of the implementation of the "State Program for Socio-Economic Development of Baku City and its settlements in 2014-2016", which was endorsed by a Presidential Order in January 2014 along with a Decree focusing on enhancing the environmental condition, protection, and utilization of Lake Boyuk Shor.

The lake restoration project is divided into two stages. The initial phase took place in 2014-2015, during which around 300 hectares of land were restored, and a dam was constructed to separate and isolate the polluted northern part. This dam effectively splits the lake into two parts. On February 28, 2014, President, Ilham Aliyev, visited the site to oversee the ongoing efforts for a comprehensive ecological restoration of Lake Boyuk Shor and the surrounding areas.

Under the supervision of the Ministry of Economy and Industry, Tamiz Sheher OJSC completed the first phase of the project in May 2015. The boulevard and park built here were inaugurated by President Ilham Aliyev and First Lady Mehriban Aliyeva. Within a short period, Lake Boyuk Shor and its surroundings have been transformed from an environmental hazard zone to a recreational area. The achieved outcome meets half of the initial plan.

The restoration and improvement of Lake Boyuk Shor began in 2015 and lasted until 2020. A new road, the Balakhani-Binagadi road, was inaugurated in December 2018, running through the dam in the lake with a length of 1,570 metres.

The next phase of the project focuses on cleaning the other side of the lake. Large volumes of industrial and domestic wastewater and oil residues discharged into Lake Boyuk Shor since Soviet times have already been prevented. Thus, before the project implementation, industrial and domestic wastewater from 76 sources was discharged into the lake. In other parts of the lake, the number of sources has been reduced to 20, with a continuing decrease. The level of oil pollution in the cleaned areas of the lake bed has dropped from 121,000 mg/kg to 86, bringing it within ecological standards. A new sewage system has been installed along the southern shore of the project area, effectively preventing pollution in that area.

Improving water quality at the lake is achieved by preventing any discharge into it. The primary territory affected by oil pollution is situated on the side of the Balakhani settlement within the project area. In order to prevent contamination of this part of the lake by oil waste from the ancient Balakhani oil fields, a dam measuring 1850 meters long was built along the borders of the historic lake bed on the Balakhani settlement side. Concurrently, efforts are being made to eliminate and neutralize the accumulated dirty sediments at the lake bottom, which have been there for over a century. During the initial phase of the project, 2.8 million cubic meters of sediment were dredged from the lake bed and stored in a temporary isolated facility for proper disposal. Rigorous protective measures were implemented, such as establishing a lake protection zone, effectively preventing pollution of the lake and shoreline from household and construction waste.

A boulevard and a park have been constructed on the eastern and southern banks of the project area. The total construction area covers more than 15 hectares. Remediation of oil-contaminated soil in this vicinity has been successfully carried out. Additionally, a drainage system has been installed to prevent groundwater contaminated by metal plates on the eastern shore from seeping into the lake. The embankment along the shore stretches for 2.5 kilometers. Various amenities such as sports facilities, children's playgrounds, running and cycling paths, and bicycles for public use have been established, along with the planting of approximately 80 thousand trees and ornamental shrubs. The installed fountain complex not only delights visitors but also enhances the city's oxygen levels, thereby improving the lake water quality.

Overall, the recreation needs of both residents and tourists have been carefully considered and addressed in this area. Advanced solar-powered technology is employed to manage the lake, enhance water quality, and ensure effective monitoring. The next phase of the restoration project for Boyuk Shor Lake is returning the lake to its original historical path, regulating water levels, and restoring the ecosystem.

The state programs for the socio-economic development of Baku city and its surrounding settlements, which were approved by President Ilham Aliyev, include plans for the restoration of Boyuk Shor Lake and 9 other lakes on the Absheron Peninsula (Boyukshor, Zigh, Khojahasan, Girmizi, Puta (Lokbatan), Gu, Binagadi, Zabrat, Bulbula) as part of efforts to improve the environmental situation in the country. To ensure the continuity of the restoration efforts on the Absheron lakes, there were carried out the restoration works of Lake Zykh in accordance with a decree issued by President Ilham Aliyev on October 15, 2014 titled "Measures to improve the ecological condition of Lake Zykh".

Balakhani solid waste landfill

The decision to construct the Municipal Solid Waste Incineration Plant was made as part of the "Plan of Complex Measures to Improve the Environmental Situation in the Republic of Azerbaijan for 2006-2010" endorsed by the President of the Republic of Azerbaijan on August 28, 2006. The contract for the design, construction, operation, and technical maintenance of the Baku Solid Waste Incineration Plant was awarded to French Company "Constructions Industrielles de la Méditerranée S.A. ("CNIM" S.A.) following a successful tender process, with the agreement being signed on December 15, 2008. This agreement was for a "turnkey" basis and carried out under a "Design, Build, Operate" framework.

Consequently, the design, construction, and operation of the plant were overseen entirely by CNIM S.A. Throughout the 20-year duration of the plant's operation, covering an area of 20 hectares with a processing capacity of 500 thousand tonnes of household waste and 10 thousand tonnes of medical waste annually, CNIM S.A. will continue to manage its operations. The total cost of the plant's design and construction amounted to 346 million euros.

The facility includes two production lines and a turbine that produces electricity. While in operation, the waste volume has decreased by 10 percent and its mass has been reduced by over three times. Through the process of utilizing waste, the plant is able to generate 231.5 million kilowatt hours of electricity annually as an alternative energy source. The plant's operations result in saving more than 60 million cubic meters of gas each year. The electricity produced is sufficient to power 100,000 residential units.

The President of the Republic of Azerbaijan Mr. Ilham Aliyev laid the foundation stone of the Solid Waste Incineration Plant on 3 November 2009 and attended its opening on 19 December 2012. This Solid Waste Incineration Plant is the largest facility of its kind in Eastern Europe and the CIS in terms of production capacity. It was established using advanced fourth generation 4G technology and meets the strictest environmental regulations of the European Union. Special filters are used to collect the ash produced during incineration, with the heavier bottom ash being able to be utilized in road construction. Daily monitoring of waste levels is conducted to ensure compliance with regulations. The plant adheres to ISO 14001 standards for environmental management. Furthermore, the plant's operations have resulted in the prevention of the release of heat-generating gases equivalent to around 100 thousand tonnes of carbon dioxide per year into the atmosphere.

Balakhani Industrial Park

A solid waste sorting plant was built to separate household waste and promote secondary businesses in the country. Balakhani Industrial Park was founded in 2017 by President Ilham Aliyev's directive. The

inauguration of Balakhani Industrial Park, attended by President Ilham Aliyev, occurred in September 2017. The industrial park, covering over 10 hectares and functioning on the principles of "green economy", prioritizes enterprises that follow recycling and zero waste practices.

When the industrial park first opened, there were five businesses operating within its boundaries. These resident companies were involved in processing used motor oil, recycling plastic bottles, producing printed materials from recycled paper, manufacturing products from recycled plastics, and processing wood. It was expected that these companies would collectively invest over AZN 22 million in the development of the industrial park.

The process of sorting divides paper, glass, plastic, non-ferrous metal, iron, and other recyclable materials, leading to a decrease in waste volume and the establishment of a market for inexpensive raw materials. It also forms a foundation for recycling within the country and helps conserve energy, while significantly decreasing the harmful effects of waste on the environment. Additionally, dangerous household items like batteries, accumulators, and electronic waste are segregated from the rest of the waste and taken to designated facilities for safe disposal.

The growth of the recycling sector will bring about the creation of new employment opportunities. At present, the industrial park has a workforce of over 1,000 individuals. It is anticipated that specialized landfills for solid household waste will be established in various regions of Azerbaijan in the coming years. The key benefits of the initiative include minimizing harm to the environment and human health, preserving natural resources and energy, creating a market for affordable recycled materials, promoting waste recycling, decreasing final waste output, and generating new jobs.