14.3.3 - Does your university as a body work directly (research and/or engagement with industries) to maintain and extend existing ecosystems and their biodiversity, of both plants and animals, especially ecosystems under threat?

Azerbaijan State Oil and Industry University (ASOIU) actively contributes to the protection, restoration, and sustainable management of natural ecosystems through its research projects, academic collaborations, and environmental engagement initiatives.

As a national leader in sustainability education, ASOIU integrates climate resilience, water management, and ecosystem conservation into both its research portfolio and community partnerships, aligning with SDG 14 (Life Below Water) and SDG 15 (Life on Land).

1. Research for Ecosystem Conservation and Biodiversity Protection

ASOIU conducts scientific research focused on preserving aquatic and terrestrial ecosystems, addressing climate impacts and anthropogenic threats. Two key examples include:

a) Climate Change and Water Resource Management: Exploring Hybrid Modeling Approaches

Researchers at ASOIU (Abdullayeva M.Y., Mammadli G.R., 2025) developed hybrid AI/ML-based hydrological models to analyse how climate change affects water resources, precipitation, and river-basin ecosystems across arid and semi-arid regions. These models enhance groundwater prediction and sustainable management capabilities—supporting ecosystem balance and biodiversity conservation through better control of droughts, floods, and water scarcity.


Climate change and water resource management: exploring hybrid modeling approaches

E3S Web of Conferences • Conference Paper • *Open Access* • 2025 • DOI: 10.1051/e3sconf/202564600016

Abdullayeva M.Y. ✉ ; Mammadli G.R.

Azerbaijan State Oil and Industry University, Baku, Azerbaijan

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b) Study of the Landscape of the Hakari River in the Climatic Conditions of Azerbaijan

In collaboration with the Water and Reclamation Scientific Research Institute, ASOIU scientists (Mekhtiyeva B., Abdullayeva M., 2025) used Geographic Information System (GIS) and Normalized Difference Vegetation Index (NDVI) analysis to assess ecological changes in the Hakari River Basin of Karabakh. The study identified

deforestation, soil degradation, and vegetation loss resulting from human activities and proposed restoration strategies for the rehabilitation of threatened forest-river ecosystems and biodiversity in post-conflict regions.


Study of the landscape of the Hakari River in the climatic conditions of Azerbaijan

BIO Web of Conferences • Conference Paper • *Open Access* • 2025 • DOI: 10.1051/bioconf/202517303033

Mekhtiyeva, Banovsha [a]; Abdullayeva, Maya [b]

[a] Water and Reclamation Scientific Research Institute Public Legal Entity, I. Dadashov 324, Baku, AZ 1130, Azerbaijan

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2. Collaboration with Industry and Environmental Institutions

ASOIU maintains partnerships with national environmental agencies, industrial sectors, and research institutes to ensure that industrial development and ecological protection progress together.

- The Sustainable Development Center coordinates applied projects on water reuse, pollution monitoring, and river-basin management with industry stakeholders.
- Joint projects with SOCAR, BP Azerbaijan, and local water authorities support green infrastructure, low-impact industrial practices, and restoration of aquatic ecosystems affected by energy operations.
- Students and researchers participate in field campaigns assessing soil, vegetation, and water quality in at-risk ecosystems such as the Caspian coastal zones, inland reservoirs, and mountain river systems.