

Ecological-geographical zoning of Azerbaijan

The Azerbaijan Republic's environment is characterized by a variety of topography, soils, and vegetation. The Republic experiences diverse climatic conditions, especially in terms of microclimates that do not need large uniform areas. Diversity of orography, soils and vegetation are characteristics of the environment of the Azerbaijan Republic. The climatic conditions of the Republic are diverse in particular the microclimates which do not require large homogeneous areas.

According to the character of orography, vegetation and topsoil, Azerbaijan is roughly divided into 5 climatic zones: the Greater Caucasus, the Lesser Caucasus, Nakhchivan, Lankaran and Kura-Araks; each



of these zones is characterized by different natural conditions, which serve as a basis for identifying the physical geographic districts. There are 19 physical-geographic districts. The territory of Azerbaijan belongs to 2 physical-geographic countries: the Caucasus and the Front-Asian plateau. The Caucasus includes 4 regions: the south-eastern part of the Greater Caucasus, Lesser Caucasus, the Kura intermountain

hollow, the Lankaran zone. The Front-Asian plateau covers the Middle Araks zone.

From the geological history of the Caucasus, it is known that all the steppe area of Azerbaijan approximately till the second part of the Tertiary period was under the waters of a large sea. The Greater and Lesser Caucasus, along with the Talish Mountains, emerged from the sea and were covered in subtropical vegetation, remnants of which can still be found in certain areas like the Talish region. These remnants serve as proof of the mild, warm, and humid climate that prevailed during that time. As the sea receded, more and more land surfaces appeared in the Caucasus region. These areas eventually formed the current climatic conditions of the central steppe region and the Nakhchivan region.

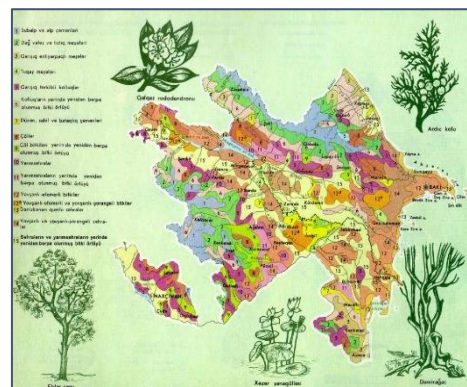
When examining the current conditions of climatic regions, it is important to consider that human activities have a significant impact on the development of micro-climates, local topography, and plant life. Understanding the level and duration of population influence is essential for defining ecological regions.

During the study of the state of the environment in Azerbaijan about 500 problematic situations have been revealed. According to their priority they may be classified as follows: 64 ecological problems caused by contamination of water resources; 48 – by air contamination and trans-boundary transmission of contaminants; 281– by contamination and destruction of topsoil including those caused by big cattle-breeding complexes and mineral mining; 30 – by the critical impact of the anthropogenic activity on flora and fauna; 71 – by urban planning and motor transportation.

Proceeding from the seriousness of the ecological consequences, the problematic situations have been classified into 4 categories: ecologically highly stressed and vulnerable areas, ecologically stressed and vulnerable areas, ecologically average and weak stressed and vulnerable areas. Such a classification

has enabled an understanding of the priorities of the ecological problems, and has also outlined the ecological districts. According to the state of the ecological situation and the character of the landscape and climate, the territory of the Republic may be classified into the following categories:

- with the most acute ecological situation (the Absheron Peninsula with Baku, Sumgait cities, the Kura River with Ganja, Mingachevir, Ali-Bayramli cities), where more than 70 % of the Republic's population lives;
- with a serious ecological and town-planning situation (Nakhchivan and practically all of the Kura-Araks lowland) with a total population of 315 thousand people;
- with individual ecological problems – the remainder of the Republic's territory.



The main sources of contamination and degradation of the natural environmental components are:

- water resources – industry, agriculture, municipal domestic sector, energy, heating, recreation;
- air basin – industry, mainly petrochemistry, motor transport, municipal-domestic sector;
- land resources – agriculture, industry, water supply system, town planning activity, transport, engineering infrastructure, recreation;
- flora and fauna – agriculture, recreation, transport, engineering infrastructure and industry.

Ecologically highly stressed and vulnerable areas

Absheron District:

Semi-desert landscape; seismicity up to VII points on XII point scale (Mashtaga, Nardaran and Bilgah); abrasion processes; wind – Khazri (nord) up to 15 m/sec; absolute maximum air temperature –



43°C; number of wind days – 30; evaporation deficit per year – 900-1000 mm; average annual relative humidity – 20%; minimum annual runoff – 0; highly polluted atmosphere; highly mineralized lakes polluted with oil and domestic wastes; soil cover highly polluted with oil and industrial wastes; close groundwater level; waterlogged and saline soils; probability of accident and fire at oil fields, warehouses and

chemical plants; occurrence of allergic, skin and gastrointestinal diseases in people.

Aran Region:

Semi-desert landscape; seismicity up to VII points; increased and repeated soil salinization; absolute maximum air temperature – 43°C; number of wind days – 50; evaporation deficit per year – 900 mm; average annual relative humidity – 20%; evaporation deficit per year – 1,200 mm; minimum annual runoff – 0-0.5 l/sec/km²; presence of various epidemics and malaria; dangerous floods; intensive pollution of soil

and water with pesticides, fertilizers and household waste; probability of gastrointestinal diseases; diseases caused by the use of large quantities of pesticides, chemical fertilizers in agriculture; intensive destruction of forest cover.

Sharur-Ordubad District:

Semi-desert landscape; seismicity up to VII points; absolute maximum air temperature – 32°C; number of wind days in mid-summer – 70; annual evapotranspiration deficit – 1000 mm; average annual relative humidity – 20%; minimum annual runoff – 0-0.5 l/sec/km²; probability of various epidemics; catastrophic floods; waterlogging and soil salinization to a great degree.

Mountainous Shirvan District:

Mountain-forest and mountain-meadow landscapes; seismicity up to IX points; intensively active landslides; degraded soils; intensively used summer and winter pastures; destructive debris flows.

Baku Bay:

Heavily polluted sea by urban activities, especially chemical industry waste; bottom sediments intensively polluted with oil products; gradual destruction of living organisms in polluted bottom sediments.

Sumgayit Bay:

Sea polluted with household and industrial wastes; heavy pollution of surface water, soil and atmospheric air.

Ecologically stressed and vulnerable areas

Southern slope of the Greater Caucasus:

Mountain-forest, high alpine, subalpine meadow, rocky landscapes; seismicity up to VIII points; high selenosity; active landslide phenomena; active gravitational tectonic fractures; high mountain snowfalls; lack of fluoride in water contributes to population diseases with dental caries and lack of iodine – thyroid disease; degraded mountain meadows; reduction of the upper forest boundary by 200-500 m due to long-term intensive cattle grazing; intensive anthropogenic soil erosion and denudation due to human mismanagement; intensification of gravity-denudation and erosion-denudation processes.

Ganikh-Agrichay District:

Forest-meadow landscapes of intermountain depressions; seismicity up to VIII points; intensive settling of mudflow sediments on river beds and surrounding areas; great damage caused by mudflows to economy, population and nature; damage caused by hail during the year.

Goygol District:

Mountain-forest and mountain-meadow landscapes; seismicity up to VIII points; active landslide phenomena in some places; accumulation of waste after mining in river valleys and on mountain slopes.

Nakhchivan Region:

Mountain-meadow, mountain-steppe and rocky landscapes; seismicity up to VIII points (in eastern and northeastern parts up to IX points); intensive erosion and arid-denudation processes; hailfall up to 7 times a year in the highland part, up to 5 days a year in the mid-mountain part; number of wind days in the hot period from 30 (mid-mountain) to 50 (low-mountain) days; absolute minimum air temperature in a year – 28°C; zone with minimum river runoff – 1 l/sec/km².

Lachin District:

Mountain-forest, mountain-meadow landscapes; seismicity up to VIII points; active landslides; intensive destruction of mountain forests; degraded summer pastures.

Lerik District:

Mountain-meadow, mountain-forest, and mountain-steppe landscapes; seismicity up to VIII points; active landslides of medium extent; hailfall – 3 days per year; high annual precipitation in the southeastern part.

Oil Rocks and Sengi Mughan:

At times water pollution with petroleum products; potential for catastrophic fires in oil pipelines, fields and oil depots. Partially ecologically stressed areas.

Ecologically average and weak stressed and vulnerable areas

Northeast Azerbaijan:

Mountain-meadow and mountain-forest landscapes; seismicity up to VII points; intensive gravity-denudation processes; active landslide phenomena; mudflows and floods, possibility of snowfall in high mountains.

Gobustan District:

Semi-desert, steppe and dry-steppe landscapes; seismicity up to VII points; intensive arid-denudation processes; ground and surface water deficit; annual minimum runoff – 0.1 l/sec/km²; number of wind days from 30 (in the north) to 50 (in the south).

Khachmaz District:

Low-altitude mountain-meadow, forest, dry-steppe, partly semi-desert landscapes; seismicity up to VII points; maximum air temperature – 43°C; number of wind days – 30; annual minimum runoff – 0-0.5 l/sec/km².

Adzhinour region:

Semi-desert, dry-steppe landscapes; seismicity up to VII points; intensive ravine and gully network; soil salinization in intermountain depressions; absolute maximum air temperature – 43°C; annual minimum runoff – 0-0.5 l/sec/km².

Gadabay District:

Mountain-forest, mountain-meadow and rocky landscapes; seismicity up to VIII points; intensive arid-denudation-gravity processes (landslides); mudflows of medium degree; hailfall in highlands – 7 days, in lowlands – 5 days per year.

Kalbajar District:

Mountain-forest and mountain-meadow landscapes; seismicity up to VII points; snowfalls in the highlands; maximum air temperature – 30°C; hailfall in the highlands – 7 days per year; intensively degraded summer meadow pastures.

Lankaran District:

Low-altitude Forest and meadow landscapes; intensive abrasion processes; large amount of annual precipitation (1,600 mm and more); annual minimum runoff – 0-1 l/sec/km²; annual maximum runoff more than 25 l/sec/km².

Ganja-Aghdam-Aghsu Region:

Dry-steppe and semi-desert landscapes; seismicity up to VII points (in the Southwest VIII points); severe waterlogging; annual absolute maximum temperature – 43°C; number of wind days in midsummer – 30; annual minimum runoff - 0-1.5 l/sec/km²; active irrigation erosion.

Kura River estuary area:

Pollution of river waters and sea by pesticides, mineral fertilizers and industrial wastes, as well as pollution from rivers flowing into it.