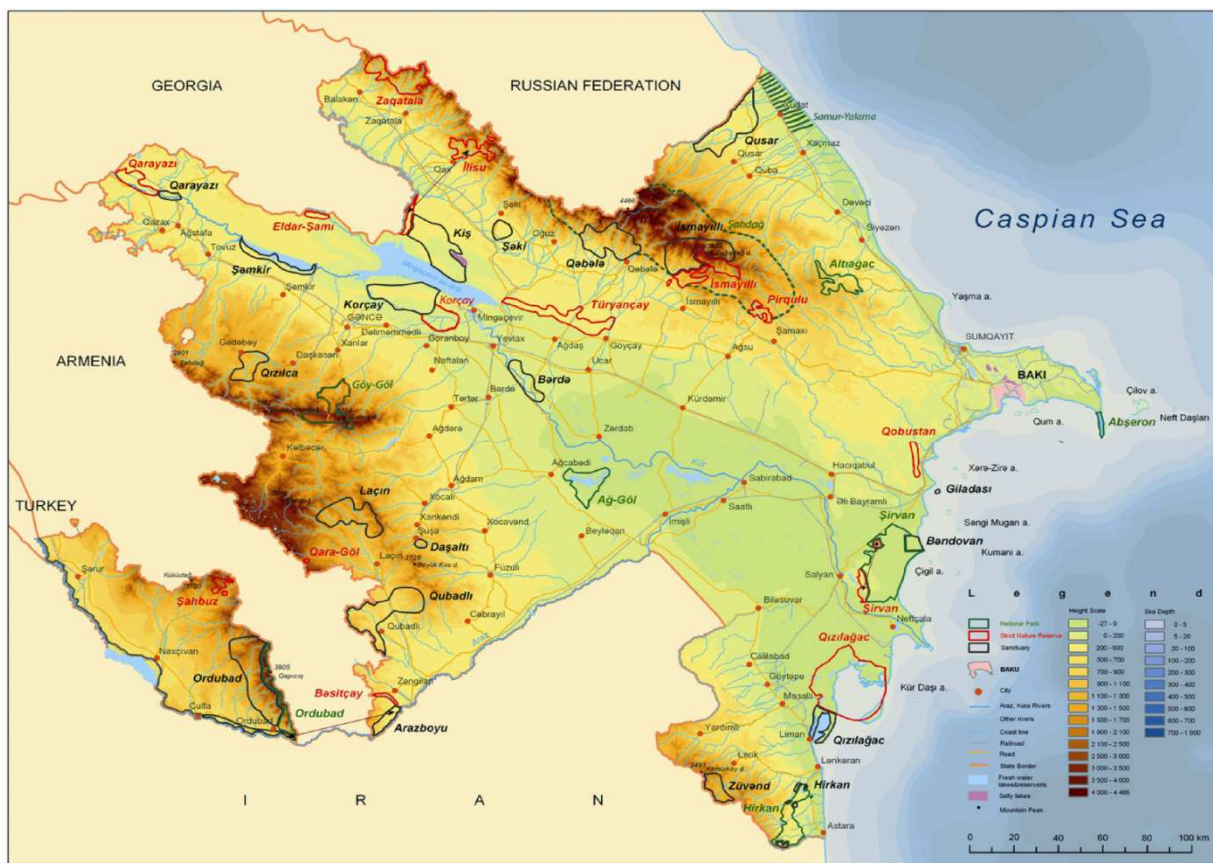


Action Plan for Implementing the Convention on Biological Diversity's Programme of Work on Protected Areas



AZERBAIJAN

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Lead implementing agency: Ministry of Ecology and Natural Resources
republic of azerbaijan

Multi-stakeholder committee: not information

Description of protected area system

National Targets and Vision for Protected Areas

(Insert national targets for protected areas/Target 11 of the Aichi Targets. Include rationale from protected area gap assessment, if completed, along with any additional information about the vision for the protected area system, including statements about the value of the protected area system to the country)

Azerbaijan enjoys extremely diverse nature. The natural and geographical conditions here have provided for the occurrence of diverse flora and fauna species. Of the 11 climate zones 9 are found in Azerbaijan. This has played an indispensable role in the formation of the country's rich biodiversity. 4500 higher plant species occur in Azerbaijan which accounts for 64% of the Caucasus species

composition. 240 of them are endemics and relicts. 140 rare and endangered species have been listed in the Red Data Book of Azerbaijan. The fauna of Azerbaijan is represented by 99 mammal, 360 bird, 54 reptiles, 9 amphibian, 14 thousand insect and 123 fish species. 108 of them are listed in the Red Data Book of Azerbaijan.

Until 2003 the overall area of specially protected sites was 478 thousand hectares constituting 5 % of the country's area. In the course of 2003 and 2011 the area of protected nature sites has been extended by almost 881 thousand hectares. The total area of 8 National Parks is 310,534 thousand hectare. At present there are 11 state nature reserves with a total area of 209 thousand hectares of the country's territory and 24 sanctuaries with a total area of 361,1 thousand hectares which encompass major ecosystems. In Azerbaijan for the first time, mud volcano state nature reserve was established in 2007.

The implementation of the creating of Samur-Yalama National Parks is ongoing now, the land use documents have been prepared and now these documents are in a study on confirming in the framework of our country. The draft documents created Marine Coastal National Park of GizilAghaj are ready and these documents have been submitted to the GEF 5 by our Ministry. Samur-Yalama National Park encompassing part of the Caspian Sea to the north of the country as well as and

creation of new National Parks are intended. Appropriation activities are being implemented to create Zagatala Balakan Biosphere Reservation.

Coverage

(Amount and % protected for terrestrial and marine; maps of protected area system)

- Shirvan and Absheron National Parks, Shirvan, Gizilaghaj State Nature Reserves, Gizilaghaj, Gil, Bandovan State Natural Sanctuary 119000 ha-13% protected for terrestrial and marine

Description and background

(Summary description) Shirvan National Park was established in July 2003 in area of 54 373, 5 hectares. It is part of specially protected site with an overall area of 65589 hectares on the south-eastern plain of the Kura-Araz lowland which also includes, Shirvan State Nature Reserve having an area of 6232 hectares and Bandovan State Natural Sanctuary with an area of 4930 hectares.

The National Park was created with a view to the conservation of foremost components of a semi-desert landscape, the protection of Goitred gazelles listed

In the Red Data Book of Azerbaijan and species of fauna that are typical to this territory. Its functions also envision the implementation of environmental monitoring, public environmental education as well as creating conditions for tourism and recreation.

The diversity of the terrain, vegetation and soil cover in the area of the national park makes it possible to distinguish a number of natural landscapes areas. A major

part of the park is occupied by saline semi-desert small hills and a saline semi-desert plain. In single areas distinct outlines of ancient coastal ridges and lagoons strike the eyes. A chain of hills is the main terrain that developed as a result of the wind's work and serves as an excellent refuge and shelter for gazelles.

Moderately warm in summer, a droghty semi-desert arid climate prevails in the area. There are no rivers and water springs here; the territory is surrounded by the Caspian Sea from the east and the General Shirvan Water Collector and

several other collectors as well as the Flamingo Lake from the north which fully supply gazelles with water. The most important for gazelles is the fact that water in the Caspian, channels and lake does not freeze in wintertime.

Despite its location in a semi-desert zone the national park is rich in animals. There are a large number of mammals, reptiles and amphibians here. Up to 65 bird species inhabit the shores of the Flamingo Lake and the Caspian. 12 fish species occur in the Flamingo Lake and channels. The national is a habitat for the following species of animals: Goitred, gazelle, wild boar, beaver, wildcat, hare, Caspian seal, wolf, jackal, fox, badger etc.

Of migratory and sedentary birds one can find here Black Francolin, Great Bustard, Little Bustard, Mute Swan, Graylag Goose, Greater Flamingo, Red-breasted Goose, Falcon, Gadwall, Common Coot, Great White Egret, Little Egret, Grey Heron, Squacco Heron.

Absheron National Park

Baku-Zira-70 km

Location area: south-west end of Absheron peninsular, Shah dili territory

Area: 783 hectare

Fauna: Caucasian tortoise, adder, silver sea gull, (fisildayan qu,) Caspian seal, gazelle

Landscape: semidesert

Absheron National Park was established in 8 February 2005 by the Decree of the President of Azerbaijan Republic in the administrative area of Azizbayov district, on the base of Absheron State Nature Sanctuary. Its area constitutes of 783 hectares. National Park is located in the South-East end of Absheron Peninsula, in the area of Shah Dili.

The main objective of establishment of the National Park is to ensure the protection of nature, conservation of endangered rare flora and fauna species (Caspian seal, gazelle, tufted duck, herring gull, mallard and etc.), implementation of environmental monitoring as well as public environmental education along with ecotourism and recreation.

Terrain core is not well-developed. The area is covered by seashore sands.

Semi desert and moderate warm climate type of dry steppes prevails in National Park.

Seashore sand plants, weed-reed and wedge meadows, annual salt-marsh weed are spread. Ephemeres grow in early spring.

Green toad, lake frog of amphibians, common tortoise, Caspian turtle, Transcaucasian agama, Schneiders gold skink, stepperunner, collard dwarf snake, water grass snake, Levantine viper and etc. of reptiles, herring gull, mute swan, tufted duck, mallard, great white egret, coot, marsh harrier, kentish plover and etc. of birds, gazelle, wolf, jackal, wild cat, raccoon, fox, badger, hare, seal of mammals and also different fish (in the Caspian Sea) occur in the National Park.

A lot of Caspian seals are spread in the Caspian sea area of Absheron National Park. The name of this species is included in records book of "Gyness" as the least seal in the World Ocean.

Creation of Absheron National Park will enable conservation and rehabilitation of rare nature complexes, gazelle and waterbirds.

Strict Nature Reserve Kizil Agac

The oldest and the biggest of all the nature reserves in Azerbaijan - in fact it was already holding an area of 180.000 ha when founded in 1926 as a Sanctuary. The reserve was re-established in 1929 to Strict Nature Reserve. From the old days up to the present the nature protection has not actually been much effective. Initially there weren't any qualified personnel to work at the reserve at all and later, too, the engagement with the reserve was rather insufficient. At times of the Soviet economic upswing, irrigation measures were carried out in the area of the Strict Nature Reserve. These included the building of dams, canals, and cultivating fields of cotton and fruits on a grand scale. In the years of 1931-32 alone, 78000 seabirds were officially killed in bird hunts even though they had been the reason for the founding of the nature reserve. After an eventful history, the size of the park has measured 88,360 ha for more than 40

years now. For migrating seabirds it is the most important area of the whole west coast of the Caspian Sea to gain food, rest and to spend the winters. Therefore, since 1975, it has been a wet biotope of international significance in accordance with the Ramsar Convention. It covers the whole bay of Kizil Agac, as well as the neighbouring steppes, semi-deserts, damp biotopes and includes parts of the island of Kura (formerly known as the sandshore of Kura).

A significant insight to the extensive human interference with nature during the last 50-100 years is provided by counts carried out during the last decades, of the seabirds spending the winter in the nature reserve on Kizil Agac:

In the winter of 1938/39 c. 3.5 – 4 millions of seabirds were counted; at the end of the 1950s 5-7 million birds were spending the winter at the reserve; but in the 1960s the numbers declined to only 1.2 millions already. Today, the number of seabirds is estimated to have further sunk to 750,000 birds.

In all probability, the 1930s data give evidence of mostly intact, natural conditions. When the Kura dam was completed in the mid 1950s, many inland wetland biotopes became dry as well as many flood areas were created near the coast. The huge seabird swarms from the north had to adjust to the new situation and shift their resting places to the bay of Kizil Agac as a necessary and, naturally, much smaller alternative to the whole Azerbaijani lowland. Of course the capacities were soon exhausted and the lack of resting areas resulted in a decline of the entire population of wintering seabirds (s. 1960 data). It is hardly surprising that to day, the population has further declined. 750,000 wintering seabirds, though, is still an impressive number that demands special attention.

Also, there are some worldwide-threatened species among the resting birds, for example:

Flamingo	up to 13,500 (occasionally also nesting)
White and Dalmatian pelican	some hundreds
Pygmy cormorant	very often nesting
Lesser white-fronted goose	2,000-3,000 (formerly up to 25,000)
Red-breasted goose	in the 1960s up to 24,000; in the 1970s 300-500; today only occasional appearance
Marbled duck	occasionally nesting and wintering
Black francolin	scarcely 1,000 breeding couples
Little bustard	maximum of 30,000

Kizil Agac is known for its big and varied bird colonies, including regularly breeding herons, spoonbills, Glossy ibis and Pygmy cormorant. In some years, the largest colony could number up to 60,000 breeding couples and thus would be the largest of its kind in Europe.

The nature reserve of Kizil Agac is probably the area of Azerbaijan where jackals can most easily be seen. They are extremely frequent and unusually tame because of the long period of hunting ban that this nature reserve has enjoyed. Wolves and Reed cat are other predators often to be found even if sightings are more difficult.

The landscape often changes quite dramatically depending on the variations of the sea level because the whole land lies very slightly above the current sea level. Relics of former vineyards, jutting out of the water in front of the beach, quite impressively demonstrate the principles of creation and transience at the coasts of the Caspian Sea.

Present plans of the Ministry of Ecology and Natural Resources aims at giving the whole region of Kizil Agac the status of a National Park, to enlarge its territory, to include areas of marine life and to decisively improve the protection

Kizil Agac, by the way, means “red tree” or “golden tree”, which, in this case, alludes to the alder tree. Alders are to be found only rarely in outlying districts, equally true of the lotus plant with its huge pink blossoms and its splendid floating carpet of leaves.

Name: Kichik Gizilagac State Nature Sanctuary

Size: 10 700 ha

Founded: February 1978

District: Lenkoran district

Restrictions: Hunting and fishery of protected fauna species

Conservation values: wetlands

Important species: Marbled teal, Great bustard, Black francolin, Reed cat, Badger, Wolf

Name: Gil adasi State Nature Sanctuary

Size: 400 ha

Founded: February, 1964

District: Garadag district

Restrictions: Hunting and fishery of protected fauna species

Conservation values: important bird species

Important species: Herring gull

Name: **Bendovan State Nature Sanctuary**

Size: 4930 ha

Founded: November 1961 (30 000 ha), in 2003 25 070 of the area was given to Shirvan National Park

District: Salyan and Garadag districts

Restrictions: Hunting and fishery of protected fauna species

Conservation values: Semi-desert area

Important species: Coot, Little bustard, Herons, Black francolin, Quail, Gazelle, Badger, Wolf

Governance types

The lands of National Parks and State Natural Reserves are under authority of the Ministry of Ecology and Natural Resources of Azerbaijan. The land of State Nature Sanctuary is property of juridical and physical persons.

(Summary matrix of governance types)

Samur-Yalama and Gizilaghaj marine National Parks, Zagatala-Balakan Biosphere reserves

Key threats

1.1.6. Key threats to biodiversity

1.1.6.1. Habitat loss and modification

Land Conversion

The major cause of biodiversity loss in Azerbaijan is the decrease in natural environments. This decrease has been due to human (anthropogenic) activities changing or destroying natural habitats. Industry and construction has had an extensive impact on natural habitats. For example, construction on the Absheron Peninsula has reduced the area of natural and unspoilt habitats, and as a result has caused a decrease in the biological diversity on the peninsula.

As a result of political events, about 250,000 people fled from Armenia to Azerbaijan, and more than 700,000 people were displaced from the land occupied by Armenia. These people were settled in towns, temporary camps, hostels and incomplete buildings. New settlements have been constructed in order to improve the way of life for these people, but not all people could be resettled. Lack of public amenities is causing both health and environmental problems in these areas.

Land degradation

A major ecological problem in Azerbaijan is the gradual degradation of agricultural land. At present 3.6 million ha of land are subject to erosion. The soil of large areas of land is also becoming salinated. At present 1.5 million ha of land has been salinated to the extent that it is no longer suitable for agriculture. Salination and erosion of soils tend to be a result of poor irrigation and drainage systems, ground water extraction and wood cutting. In addition, the location of refugee and displaced persons settlements near river-banks and canals can degrade the integrity of the channels.

Grazing by cattle has affected large areas of natural grassland habitats, and has contributed to soil erosion. Overgrazing by cattle reduces the amounts of plant matter available to other natural herbivores in the environment, thus decreasing their numbers and changing the dynamics of the community. Overgrazing can also cause the local extinction of plants in some areas.

Loss of forests is also contributing to soil erosion and land degradation. Forest cover provides a protective function to surrounding lands, without it the soils become exposed and erode, and flooding onto neighbouring lands contributes to further soil erosion.

Land is also affected by the uncontrolled use of fertilizers, herbicides, and pesticides on a large scale, and such habitat modification may reduce biodiversity. In recent years there has been an increase in uncontrolled import of these chemicals into the Republic. There is also little awareness among farmers on the correct use of these chemicals. Overuse can cause a number of negative effects in natural communities and can threaten key species, especially those at the top of food chains. Over recent years, due to the decentralisation and privatisation of companies, and an increase in prices, the level of fertilizer use has decreased. At present 90-95 % of fertilizers used are nitrogenous, as other types are too expensive.

Habitat Fragmentation

The fragmentation of ecosystems in Azerbaijan is prevalent in several ecosystems:

Forests. The unavailability of natural gas, and other fuels has meant that some communities are using wood as their major source of fuel. Wood is taken from surrounding forests, and as well as destabilising soil complexes this unsustainable cutting fragments the forest ecosystems. In other parts of the country forests are being fragmented as economically valuable timber species (such as nut and oak) are illegally harvested at an unsustainable level. However improvement of some remote habitats with gas provision, prohibition of any use of forest resources by the Ministry of Ecology and Natural Resources and propaganda on usage of alternative energy sources among the population led to a positive change in this sphere.

- **Grasslands.** Converting lowland grassy ecosystems into agricultural land, through ploughing and scrub removal is fragmenting the remaining area of natural steppes. This is also having a significant impact on the population of birds that rely on these unique ecosystems. Many of the steppe ecosystems are also fragmented by irrigation channels and associated constructions (particularly the Kura-Araz plain).
- **Rivers.** The construction of hydrological dams on the major rivers flowing into the Caspian Sea, has created obstacles that effectively fragment the riverine habitat for some species (for example, as a result of the construction of the Mingachevir and Bahramtapa reservoirs on the Kura and Araz rivers). This has reduced the breeding areas for sturgeons because they are unable to pass the dams to reach breeding areas upstream and has resulted in a decrease in their population.

The arid climate of the Nakhichevan Autonomous Republic, characterized by extreme temperatures and low rainfall, makes the land increasingly fragile with respect to anthropogenic impacts (from agricultural and industrial uses), and water management (including irrigation) has had particular impacts on the territory. Misuse of pastures, forests and agricultural lands has reduced their productivity.

Some areas of land have been significantly degraded, including wide areas of grassland habitat along the Araz River, water bodies, forests, scrub and pasturelands. Salination has affected large areas of grassland in Nakhichevan (up to 10,000 ha), particularly in the districts of Sadarak and Julfa. Little efforts have been made to restore these lands over recent years, and as a result these lands are no longer suitable for agriculture and are reverting to marshes. Modern irrigation techniques would need needed in order to recover these lands.

1.1.6.2. Over-use of biological and natural resources

Overgrazing of grasslands and pastures

During Soviet times, land was owned by the State, and as such, the people did not view the land as theirs to protect. This resulted in the overgrazing of grasslands and plains in many regions. Furthermore, due to the recent economic decline in the country, many people have attempted to increase their income from natural resources. This has been reflected by an increase in the area and intensity of land now grazed by cattle. The intensive use of pastures, such as in the Absheron and Gobustan area has accelerated the erosion of the soil, and the desertification of the land. Some refugee families and displaced persons have settled and now breed stock in several regions of the country. Unfortunately, because there is no summer pasture for their stock, they remain on the winter pasture all year, which leads to overgrazing to the extent that the pasture can no longer be used. Earth works and geobotanical survey were carried out in the years of 1949-1951 for the last time in natural fodder

fields which located in the territory of Azerbaijan Republic and being main forage reserve of livestock (especially sheep breeding). There existed 8203.4 thousand heads of sheeps and goats on all natures of household in the republic up to January 1, 2008. 3049.1 ha winter quarters and 1507.9 thousand ha summer pasture are required for provision of the sheeps and goats with winter quarters and summer pastures. As mentioned above, there exist 1395.1 thousand ha winter quarters for 2876.0 thousand heads and 563.9 thousand ha summer pastures (including areas under occupation) for 1939.4 thousand heads. Provision of the sheeps and goats with winter quarters totals to 35.1% and with summer pastures to 25.4% including pastures-grazing fields under occupation.

Over use of forest resources

In 1999-2000 there were many areas in the country where the local population did not have access to energy sources such as electricity, gas and coal, and imports of wood. The wood in the surrounding environment has therefore been cut for use as fuel. In many places wood has been cut at an unsustainable rate, and some of the forests that are being destroyed include those that are internationally important habitats. Forests in the occupied territories are also used unsustainably, and the volume of timber extracted from such forests by Armenians continues to increase.

More grievous problem faced by countrywide silviculture is existence of 261 thousand ha (or 25% of forest covered area) forest area and getting out of 10.2 thousand ha forest area from farming turnover as a result of Armenian aggression. The forests remained under the occupation are savagely cut and sacked. Cutting of valuable trees grown in these territories leads to critical limit of biodiversity protection. Intensified development of timber industry in Armenia is observed after occupation of territories of Azerbaijan Republic. So, although total volume of wood transportation equalled to 58 thousand m³ in Armenia in 1989 it reached to 206.6 thousand m³ by increasing as 3.5 times in 1993 and volume of manufacturing and transportation of used wood reached to 14.2 thousand m³ in 1993 from 7.2 thousand m³ in 1988 by increasing as 1.97 times. Nevertheless total area of Armenian forests is 3 times less than forest lands of Azerbaijan Republic.

Despite forest area of Azerbaijan Republic is 3 times larger than Armenian forest area, Armenia Republic takes first place in fabrication of furniture among countries joined the Commonwealth of Independent States on account of forests under occupation.

So that unanalogous endemic East plane forest covering small area (240 ha) at Basitchay basin in the territory of Zangilan region are savagely cut and sold to foreign countries for furniture making. Moreover, Araz oak having great umbrella and red oak disseminated on high mountain slopes in the territory of Lachin region can be exemplified. This specy being one of various species of high mountain oak is widely used in manufacturing of wine and brandy barrels and tuns because of wood redness. Ordinary nut in Lachin region and bear hazelnut, also beech, hornbeam trees and etc. are fallen incidentally without following forestry rules and handed over for furniture making. There cut off 163

walnut trees being under state forest fund and 507 walnut trees at areas not included in state forest fund in the years of 2002-2003. "Max Wood" society obtained 587 tons of wood stumps, 478 m³ used trees and 37 m³ manufacturing trees within 2001-2003.

Prevailing over hunting regulations

There occurred positive changes in this sphere within the past 6 years, it initially proceeds from adoption of necessary statutory acts (one Law and more than ten Decisions) in regulation of hunting and fishing activities in countrywide territory. At the same time, assigning of authorities on control over hunting activity and management of hunting areas to the Ministry of Ecology and Natural Resources as only state body led to effective control over the above sector. However noncompliance with quotas which assigned to regulate use of relevant biological resources - hunting fields and illegal hunting (fishing) adversely impact to number growth of several biodiversity species.

Furthermore, low-level ecological education and environmental consciousness result in killing of some dangerous animals, for example snakes (*in many cases the people kill amphibia and reptiles without distinction in venomous and unvenomous snakes*) and, in failure to adhere hunting rules and regulations.

Pet trade

Efforts of smuggling in rare and exotic species of rich flora and especially fauna of Azerbaijan Republic is regularly observed and recorded. For example, due to a need of species such as valuable falcons including falco cherrug and ordinary falcon (falco peregrinus) for hunting purposes in arabian countries and sold on sufficiently expensive price, there exist facts on immigration of citizens of foreign countries (Iran Islamic Republic, Syria, Lebanon and etc.) and illegal poaching in order to capture and smuggle them. At the same time, selling of spawn of sturgeons on most expensive price in foreign market causes to efforts towards poaching in countrywide territory and smuggling.

Water extraction

Azerbaijan is rich in natural resources, and industrial development provides many opportunities for the country. Nevertheless, ecological problems have occurred because of the unsystematic use of these natural resources, and because modern technologies are not always applied to prevent these problems. The extraction of water resources is a particular issue. Of the 35 milliard m³ of water resources in the country, 5 milliard m³ of is ground water, and 21,4 milliard m³ is in the 38 reservoirs, and 900 million m³ in 450 lakes. According to State sources, approximately 10 milliard m³ of water is used each year, and just under 3 milliard m³ of this water is lost due to poor transportation systems. Of the water used, 70% is from neighbouring countries, and there is an annual water deficiency of 4 milliard m³.

In Nakhichevan Autonomous Republic over-grazing has affected the productivity of pasturelands, and many areas are suffering from erosion and other indications of degradation. For example, grass is scarce and unproductive in the Araz plains, which act as the winter pastures. These lands would now sustainably support up to ten cows/ha, but densities of up to 300 cows/ha are still recorded. The most productive lands remain within Sharur district, and in some parts of Sadarak district. Nakhichevan's forests have also been over-used as a source of fuel, charcoal and construction materials.

Hunting is prevalent in Nakhichevan, and hunting quotas appear to be generally exceeded. Range of animal rare species is hunted. Fishing is popular for sport, recreation, subsistence and commerce. However, the fish catch exceeds official quotas, and in addition a range of illegal fishing methods are used and fish are illegally hunted during the spawning season. Fish populations are also affected by other factors such as: lack of regulation of water levels; lack of fish protection equipment in reservoirs; and pollution. Trade in a number of wild species is reported from Nakhichevan. These include wild boar, mouflon, mountain goat (bezoar), quail, venomous snakes, and wild plants such as tulips and orchids.

Water extraction is an important issue in Nakhichevan, given its abundance of water bodies and underground water sources. The breakdown, inefficiency and leakage from irrigation systems and reservoirs result in losses of up to 40% of water due to be used for irrigation.

Hunting is widely spread in Nakhichevan and violation of the assigned hunting and fishing quotas is allowed, plus a number of illegal hunting methods are broadly being used.

Taking off water from water basins and underground water layers is very important for Nakhichevan. The accidents and unregulated fetching of water from irrigation system and water reservoirs lead to loss of water to the extent of 40% for irrigation purposes.

1.1.6.3. Pollution

Water pollution

Challenges related to water resources serve as a background for problems on protection of environment in the region. Demand for countrywide water reserves and protection from pollution is put forward as a main strategic security action.

As 3/4 part of territories of the country located in lower relief of Kura river basin being the largest water through-passage, pollution of river in the territories of neighbouring states causes ecological burden. So that average 350 million m³ polluted waters are diverted to Kura river basin from Armenian territory, average 330 million m³ polluted waters from Georgia territory. Diversion of untreated sewages by neighbouring states to Kura river basin adversely impacts to its hydrochemical process and water quality. As a result of transboundary pollution, water basins underwent to pollution in any extent, self-regeneration process disrupted hereof and they became dangerous source while using. During recent studies there observed sufficiently high density of copper, molibdenum, zinc, phenol and petroleum derivatives (10 times more than allowable norm/tolerance pollution standard) in river waters resulted from transboundary pollution .

Usage of river waters which undergone to serious pollution, by 80% of the countrywide population in potable water supply and agriculture causes a danger for human health. Probability of infection of people with different diseases is built up due to use of poor potable waters.

It was determined as a result of recent observations carried out on transit river flows by proper authorities of the country that majority of incoming transit flows are polluted with ingredients could cause a number of complications. Phenols and copper compounds take particular place among such ingredients. So as a result of analyses it was determined that in boundary zones with Armenia quantity of phenols in Araz river is 8-10 times more than tolerance pollution standard, copper compounds are 6-8 times more and accordingly the above in Aghstafa river are 4-9 and 7-11 times more than tolerance pollution standard.

Aghstafa river as a right distributary of Kura river comes in countrywide territory in Gazakh region passing through territory of Armenia Republic. Main reason for pollution of this river is characterized in direct diversion of mill waters and household-sanitary sewages in big cities of Armenia without treatment and disinfection. Aghstafa storage pond was founded in 1971 and has water capacity of 120 million m³. Considering usage of waters of this storage pond in irrigation of areas in Gazakh and neighbouring regions, as well as in potable water supply of a part of Gazakh population, extent of ecological aggression can be imagined clearly.

Waste waters of copper-molibdenum enterprises and big cities of Armenia are directly discharged into Okhchu river without treatment. Density of copper, molibdenum and other heavy metals in river waters in Azerbaijan-Armenia border are observed to be 10 times more than tolerance because of overpollution of these waters. As a result, microflora and fauna in river waters devastated, self-purification process stopped and subsequently, river basin became "dead zone".

Also, Sarsang water storage basin located in the territory of Nagorno-Karabakh which occupied by Armenia, is used as a pressure medium. Waters of the storage basin at 560 million m³ capacity are diverted to villages and habitats comprised by Azerbaijani population without considering seasonal needs of the area in winter and as a consequence, sharp water lack appears in this area during summer season. Habitats, agricultural fields and communication lines are undergone water flooding in winter. But in summer the people suffer from water deficiency and as a result of desertification, soil degradation is observed. Thereby, it complicates poor living condition of the local population, especially of internally displaced people and refugees.

As 20% of the territories of Azerbaijan Republic was occupied by Armenian forces, severely exploitation of our natural resources and overpollution of water resources are observed resulted from isolation of these areas from ecological control and hereof, obtaining of exact information on pollution of Kura river basin became difficult to the last extent.

Forest cover plays a specific role in solution of problems related to water resources. So, being sparsely forested country, totally 11% of Azerbaijan territory is covered with forest. Besides, 25% of overall forest cover is under occupation as a consequence of Armenian aggression. Thus, insufficiency of forest resources can lead to exhaustion of natural water reserves gradually.

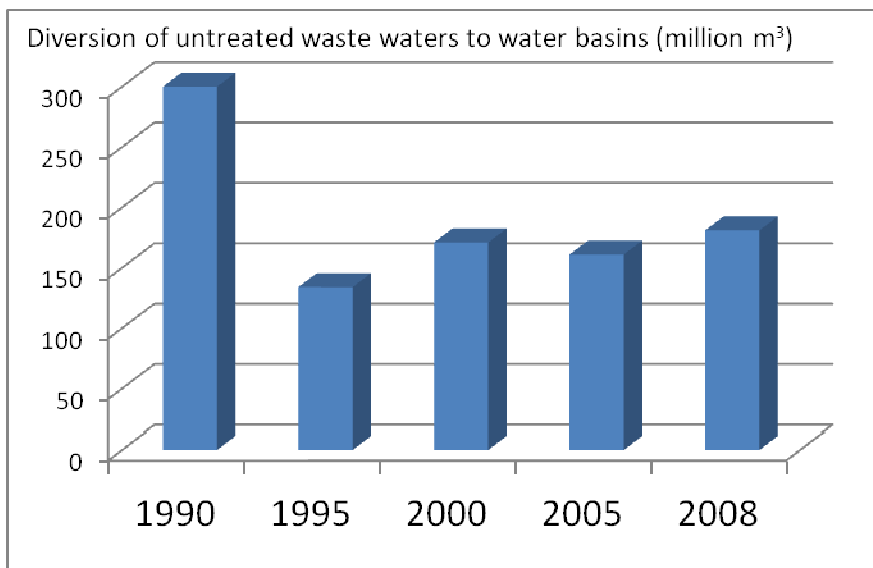
At the present, all transit rivers of Azerbaijan undergo strong pollutant effect in upstreams and upcurrents. It can be characterized in very dangerous ecological tendency.

At the same time, use of water factor by Armenian Republic as a scare gives rise to anxiety. In this standpoint, necessity of strictly addressing ecological safety factors must be taken into account as one of most significant challenges while establishing international safety systems. Practical actions should be carried out by regional states for prevention of transboundary pollution of water reserves in South Caucasus and specific steps should be taken for solution of current problems.

Azerbaijan Republic has ratified Helsinki convention "On protection and use of boundary water flows and international lakes" in order to solve problems of interfrontier water basins within the framework of international norms in regional level, but neighbouring states have not joined this convention.

Main reason for inefficient use of countrywide water resources and occurrence of water basins pollution is characterized in insufficient provision of republic city and region centres and other dwelling places with sewerage system as well as enterprises with water treatment facilities and unsuitability of operated units and facilities. Untreated industrial and household waste waters of large cities in the country play a major role in pollution of water basins.

22 mechanical and biological treatment facilities are functioning for purification of sanitary-waste waters in territory of the republic. It should be noted that nonoperation of the existing facilities in compliance with the regulations causes to pollution of water basins.



Diversion of industrial and household sewages without complete purification to water sources, including to the Caspian sea causes to generation of other ecological problems. Encountering of biological resources in the sea is related to enhancement of adverse effects of anthropogenous factors.

There exist more than 200 lakes with total area of 3325 ha in Absheron peninsula. Long-term use of old and obsolete technologies in oil mines caused to pollution of soil with oil and produced waters. These areas play a major role in pollution of the Caspian sea. The lakes lead to degradation and salinization of soil by impacting upon the environment and to underflooding of additional lands resulted from ground water rise and to emission of hydrocarbons and other repugnant substances resulted from evaporation and to underflooding of habitats, roads and communication lines.

Fluctuation of level, pollution of sea waters and aggravation of ecological situation hereof, are main ecological problems of the Caspian sea.

Key pollution sources of the Caspian sea consist of sewage waters of cities and industrial facilities located on its coasts and various pollutants coming from sea transport and oil mines.

Sewage waters diverted to the Caspian sea which coming from coastal cities are considered to be major pollutants. Moreover operation of offshore oil fields and delivery of petroleum derivatives as well as sea transport pollute the Caspian waters more and more.

At the present, the Government of Azerbaijan carries out relevant actions in protection of the Caspian sea from pollution. Azerbaijan is an only country among the Caspian states that takes part in maintenance of environmental balance in the Caspian sea through large-scale projects.

“Integrated Actions Plan on improvement of ecological situation in Azerbaijan Republic for the years 2006-2010” stimulated greatly to works carried out in protection of countrywide environment.

Allocation of funds for implementation of measures provided by the Integrated Actions Plan realizes timely solution of these problems.

Different projects are executed on account of countrywide budget funds and under support of international financial institutions. Projects on water supply and treatment of waste sewages are implemented in small cities. There established “Azersu” Joint Stock Company in order to promote management in this sphere and to provide management of problems solution related to water supply and waste waters by an integrated body. This step which taken in solution of current problems in the country serves to reconstruction and enhancement of water supply and sewerage systems.

Construction and reconstruction of water reservoirs, water pipelines, water supply and treatment facilities are performed by proper authorities under credit of the World Bank, Asia Development Bank and other financial institutions, including on account of the budget funds in order to improve quality of potable water.

Thereby purification of water in compliance with requirements of relevant statutory documents in water treatment stations and supply of water consumers with uninterrupted and safe potable water are provided in phases.

Presently, actions are ongoing in supply of villages of countrywide different regions with module water treatment facilities and installations which functioning in off-line/autonomous mode. There set and commissioned module type water treatment facilities in 122 habitats of 12 regions with 224 thousand people overall by the Government according to Decrees of the President of Azerbaijan Republic concerning improvement of ecologically pure water supply of the population who used waters of Kura and Araz rivers. In general, as a result of execution of the Presidential Decrees water delivered for 800 thousand rural peoples will be purified in conformity with norms and regulations of the World Health Organization through installation of module type water treatment facilities in more than 500 thousand villages which limited in qualitative water opportunities.

Soil pollution

One of the existing key ecological challenges is undergoing of soil to erosion and degradation. Main reasons of the problem are natural climate condition, absence of farming continued for a long time, exceeding of livestock number as compared to ecological capacity of the lands and unregular grazing of the livestock, unexecution of cropping/cultivation rules, declining of forests, woodlands and greenery, deteriorated state of collector-drainage systems and other human-caused factors. Approximate 3 million ha area has undergone to salting, erosion and corrosion in the republic. Zones surrounding Plain Garabagh, Upstream Shirvan, Central Mughan, Mughan-Salyan collectors was undergone to salting and soil erosion mostly.

As a consequence of long-term incidental exploitation of natural resources, nonapplicability of new technologies, expansion of unlawful interventions in nature and other intensive anthropogenous impacts, major part of soil in Absheron peninsula was polluted with petroleum derivatives and processing, sanitary and etc. wastes and subsequently, there appeared a number of serious ecological problems in the region.

Total area of lands degraded as a result of anthropogenous impacts in Absheron peninsula is 33.3 thousand ha, including oil pollution areas 10.6 thousand ha. Lands mostly polluted with oil and petroleum derivatives are situated in the territories of Garadagh, Binagadi, Sabunchu, Surakhany, Azizbayov and Sabayil districts.

Management of solid domestic wastes (urban ore)

There exist serious problems related to management of solid domestic wastes in the country, especially in large cities of the republic. Absence of compliance with rules on sorting, transportation and disposal of wastes and refuse according to standards and nonutilization of them became danger source for public health alongside with pollution of the environment.

125 illegal dump sites exist in Absheron peninsula together with 5 solid waste landfills. Current landfills do not meet ecological norms and standards. On the other hand, no any technologies are applied in utilization and treatment of plastic and polyethylene packing materials. 63587 thousand plastic packing materials were manufactured and removed after usage in the country in 2008.

Management of hazardous wastes

Overall quantity of hazardous process wastes totalled to 1650 thousand tons remained at areas of countrywide manufacturing enterprises for the end of 2008. Storage condition of the wastes do not satisfy ecological norms and standards in many cases and causes to source of danger for the environment and human health.

No any technologies are applied in utilization and treatment of many hazardous wastes (scavenge fuel-lubricative materials, mercury lamps, accumulators and rubber tires). There accrued 47585 tons of fuel-lubricative materials, 0.8 tons of used mercury lamps, 313.3 thousand accumulators and 693.6 thousand rubber tires in the country in 2008.

Pollution of atmosphere

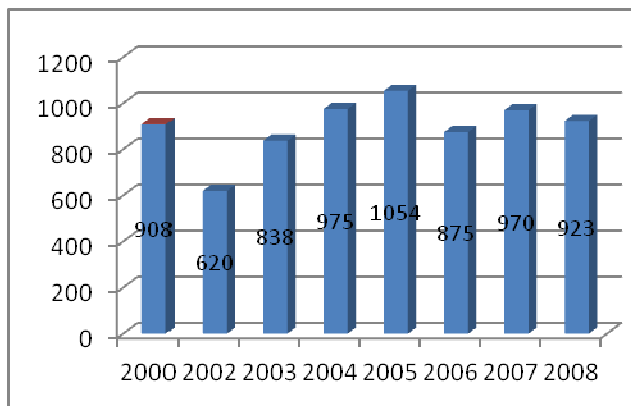
Quantity of overall emissions from stationary and mobile pollution sources decreased due to declining of industrial activity in the country territory since 1990 year. Level of air pollution was in most serious state at processing units of oil-gas production and oil refinery and chemistry industry in large-scale cities

such as Baku and Sumgayit. Emissions from mobile pollution sources increased considerably as a result of growth of vehicles number within the past period.

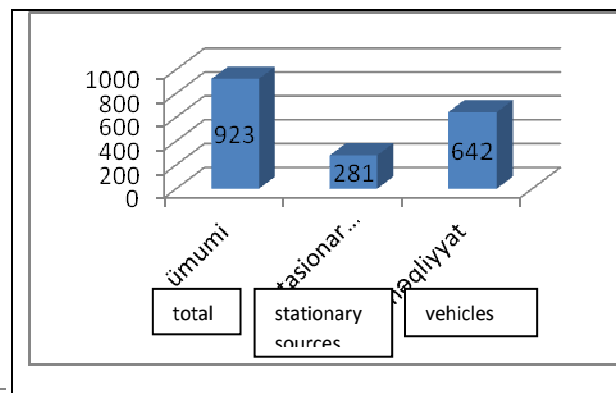
Large cities in Azerbaijan suffered from pollution level of atmosphere precedently that it was deemed to be hazardous for public health. Declining of industrial production improved air quality considerably, but the situation can be varied towards deterioration due to gradually accruing vehicles. At the present, key sectors mostly polluting the atmosphere are comprised by transport, industry and energetics. Wastes from stationary pollution sources were less as 80%, emissions from mobile sources were higher as 34% in 2008 as compared to 1991.

Nevertheless total quantity of emissions from stationary sources equalled to 515 million tons 2000, this figure totalled to 281 thousand tons in 2008. But intensive growth of vehicles number in the republic, especially in Baku city enhanced volume of deleterious gas emissions from mobile pollution sources within the last years. Harmful emissions from mobile sources equalled to 69.5% of overall wastes in 2008.

Data about quantity of overall emissions on the country since 2000 and emissions on sources in 2008 are shown in the following diagrams:



Quantity of emissions on the country,
thousand ton (2000-2008 years)



Quantity of emissions on sources in 2008
(thousand ton)

As evident from outcomes of the monitoring, the atmosphere in large cities of the republic is undergone to pollution in various extent depending on lines of business working for countrywide large industrial cities. Volume of specific air pollutants such as dust, carbon monoxide, nitrided 4-oxide, fume and furfurool exceeds tolerance in several days in Baku city. Specific air pollutants such as chlorine, nitrided 4-oxide, hydrogen fluoride and others are referred to Sumgayit city. Out of repugnant substances only

volume of hydrogen fluoride exceeds tolerance in Ganja city. Pollution of the atmosphere with nitrided 4-oxide is more peculiar in Shirvan city. It was observed that the atmosphere in Nakhichevan, Shaki, Mingachevir and Lankaran cities did not undergo to pollution.

The Autonomous Republic of Nakhichevan faces a particular threat from water and soil pollution. At present the area lacks any modern facilities to clean water, and each day 2.4 million m³ of polluted water from Nakhichevan city is released into the Nakhichevan River, which in turn flows into the Araz River. This contributed to the increasing pollution levels in this river, which also receives 4-5 million m³ of untreated water from Armenia every day, from both residential and industrial sources (including chemical factories). Sediment loads in the river have increased dramatically, heavy metals may be as much a five times greater than recommended safe levels, and nitrates are particularly high. Salination of land and associated pollution, as a result of poor irrigation practices, is also a major problem in Nakhichevan.

Air pollution is less of a problem in Nakhichevan than in some of the larger cities of Azerbaijan, however concerns are increasing over the impact of vehicle emissions in the territory, particularly from trucks transporting goods over the mountain passes to Iran and Turkey. Lime and cement works in Nakhichevan may also contribute to air pollution. There is an increasing problem in relation to waste disposal from residential, industrial, market and office sources.

1.1.6.4. Introduced and invasive species

There are several notable species that are considered to be invasive in Azerbaijan. One of the most notable is the comb jelly *Mnemiopsis leidyi* - an introduced species that invaded the Caspian through the Volga Don channel. Its population has now multiplied to the extent that the biomass of the population has exceeded the general productive biomass of the sea. There are no predators for this jelly in the Caspian, and climatic conditions favour its growth and reproduction. It feeds on animal plankton, including the planktonic larvae of fish, and as such, it is capable of seriously undermining economically and biologically important fish populations. This could also impact the rest of the food chain, as top predators, such as the Caspian seal and sturgeon species, are reliant on healthy fish populations.

Of the 21 introduced samples of the invasive species American racoon (*Procyon lotor*), ten males and eleven females were released in the Ismayilli region in 1941 from where they have spread to other regions of the Republic. They are now widely spread throughout the forest ecosystems of Azerbaijan, and hunting of this species is encouraged throughout the year.

Regarding plants adventitious weedery such as ambrosia artemisiifolia L, cuscuts L., acroptilon repens DC., solanium rostratum Dun spreaded out in countrywide flora and squeeze out the local species seriously. Plant ambrosia artemisiifolia L is widely spread in North Caucasus. Local people who had been aware of this plant as a quarantine weed since ancient times clean it throughout all areas massively in spring months of every year. Pollens of this plant lead to death of children under 10 age by splashing into their throats and cause illness of adults by infection.

One of adventitious species which causes huge damage to greenery of nature and agrobiocenoses in Azerbaijan, is American white butterfly. Dissemination of this species becomes more hazardous year by year in enduring all preventive control actions.

1.1.6.5. Natural pathogens

In Azerbaijan there are many natural pathogenic viruses and bacteria that affect livestock and other animals. Their impact on the animal can be varied, however a high load of parasites weakens an animal and can reduce its immune response. Some of these pathogens are naturally occurring (such as rabies, a highly infectious virus that damages the central nervous system of animals). Viruses and parasitic fungi can affect plants, and many have a damaging effect on crop plants. Pathogenic parasitic protozoa are not great in number. However some are present that infect animal species.

A great number of parasitic worms have been recorded in Azerbaijan, including over 4,000 species of Platyhelminthes (flatworms) and 789 Nematelminthes (nematodes) (of the 24 species to animals and 318 species to plants cause diseases). Diseases caused by parasitic nematodes include a disease in foxes (particularly worrying because of the close links between the habitations of humans and foxes), a fatal disease found in populations of wild and domestic pigs, and other diseases that are found in domestic and wild animal populations. The impact of such disease on populations of wild animals is not fully understood.

There observed and recorded H1N1 and H1N5 pathology virus diseases appeared in wildlife and occurred with human infection within the last years, namely since 2005. For the purpose of prevention and prophylactics of the diseases, State Commission was established attached to the Cabinet of Ministers in presence of high officials of proper authorities.

Introduced pests (such as the Colorado beetle) have affected a number of agricultural systems in the Nakhichevan Autonomous Republic, as a result of lack of quarantine controls on imports. An agreement of trade and plant quarantine restrictions was reached between Azerbaijan and Iran in 2002, allowing for new regulations on transfer of seeds and other agricultural products, and avoids accidental transfer of key species likely to pose a threat to agriculture (including bacteria, fungi, nematodes, insect pests and weeds).

1.1.6.6. Climate changes and natural disasters

Climate change is an ecological problem on a global scale that poses a recognized threat to all ecosystems and associated biodiversity. Predictions suggest that climate change is likely to have a negative impact on ecosystems in Azerbaijan and may result in increased flooding and desertification, fragmentation of habitats, and species extinction. Over the last century the air temperature in Azerbaijan has increased on average by around half a degree Celsius, with the highest changes in temperature recorded from the Greater Caucasus and the Kura-Araz lowland (0.5 - 0.6°C) and lowest changes recorded in Minor Caucasus and along Caspian shoreline.

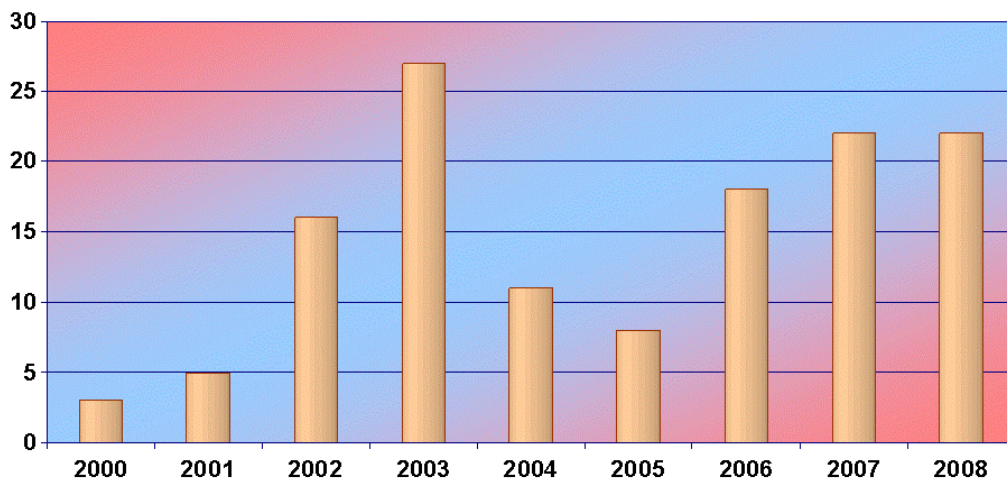
Based on global models of climate change, experts estimate that average temperatures in Azerbaijan could increase by as much as 2°C. Associated with this it is expected the incidence of

temperature extremes will increase, as will extreme weather events. Particularly important, is a predicted decrease in humidity for much of Azerbaijan.

Such increases could affect the availability of water (particularly in arid regions), which could in turn impact on irrigation, drinking water, and power production. Biological systems would also be affected under this scenario, with predictions of changed ecosystem dynamics and degradation of forest zones. The predictions suggest that the area of deciduous forest will decrease by 20%, while coniferous woodland will increase by 12%, and scrub coverage could increase by as much as 70%. The area of oak forest could reduce by 2-3%, although areas of beech would increase by 15% and hornbeam by 19%.

The warmer climate could increase productivity for a number of plants, and this would favour increased agriculture (including vineyards, cotton and fodder production). However, the increase in evapo-transpiration from the soil could result in increased salination and erosion, ultimately leading to desertification.

Insufficiency of water resources and their irregular distribution on areas and seasons lead to problems in use of water in many cases. Only 5-20% of annual water flows of rivers fall on vegetation period depending on the region. On the other hand, nevertheless water deficiency is observed in low-water periods, but flooding and overflowing appear in abundant water seasons. Enhancement of such occurrences was observed within the last years (Picture 1.1).



Picture 1.1. Tendency of floods observed in the years of 1999-2008

Depending on surface fluctuation of the Caspian sea, rising of ground water level caused to overflow of surrounding areas at length of 200 km from outfall of Kura river during inundation period since 1993. Riverside villages of Salyan, Neftchala, Sabirabad regions and bank areas of Shirvan city which located on riverside of Kura undergo underflows as a consequence of floods and inundations. As a result, large-

scale facilities, farms, household plots, home grounds and dwelling houses in these areas seriously suffer hereof. (Picture 1.2).



Picture 1.2. Flooding observed in Kura river in the territory of Salyan region in 2003

There observed heavy floods and overflows in the rivers refulted from snowmelt on mountainous areas and showery rains because of a sharp rise in temperatures over mountainy areas of Great and Little Caucasus within 2003-2008.

2 persons died in Amirvar village of Dashkasan region caused by flood passing through Shamkir river in the evening on April 6, **2003** due to snowmelt in uplands of Little Caucasus because of a sharp rise in temperature and 3 persons underwent to drowning death caused by flood passing through Gilgil river in Davachi-Siyazan region on May 18, **2003**. Arable lands, houses and bridges were damaged as a result of short-term floodings in the rivers of Tala, Kurmuk, Kish, Shin, Dashaghil, Khalkhal, Alinja, Gala and Damiraparan in Balakan-Shaki and Oghuz-Gabala regions on May 22-23, at local time 22⁰⁰-05⁰⁰.

There occurred floods in the rivers of Balakan-Shaki-Gabala region on July 10, **2004** at local time 03⁵⁰-08³⁰. Thus floods and inundations were observed in the rivers of Kish, Shin, Kurmuk, Tala, Gara, Katekh, Balakan and Mazim. Pedestrian overpass/footbridge in Mahamalar village of Balakan region was

undergone overflows. Therefore potable water supply of Balakan and Shaki regions was disrupted. As a consequence of shower rains (hails, wind) in the evening on July 22, short-term overflows passed through Goshgar river across Dashkasan region and finally, 4 persons drowned in the river, electric piles were broken down, some houses were destructed and arable lands were damaged.

As a result of shower rains on July 29, **2006** floods and overflows passed through the rivers of Mazim, Balakan, Gara, Katekh, Tala, Kurmuk, Kish, Shin, Ayri, Dashaghilcha in Balakan-Shaki region. As a consequence of overflow passing through Kish, Shin and Dashaghilcha rivers surrounding villages were damaged considerably and arable lands, underground telephone lines, roads and intervillage footbridges underwent to flooding. Therefore potable water supply of Shaki region was disrupted and some houses remained under flows. A flood was observed in Saraturk river as a result of shower rain on September 27 at local time 19⁴⁵. Level of water rised as 95 cm, water consumption exceeded 15 m³/cm. Subsequently, 2 persons died in overflow while rescuing cows.

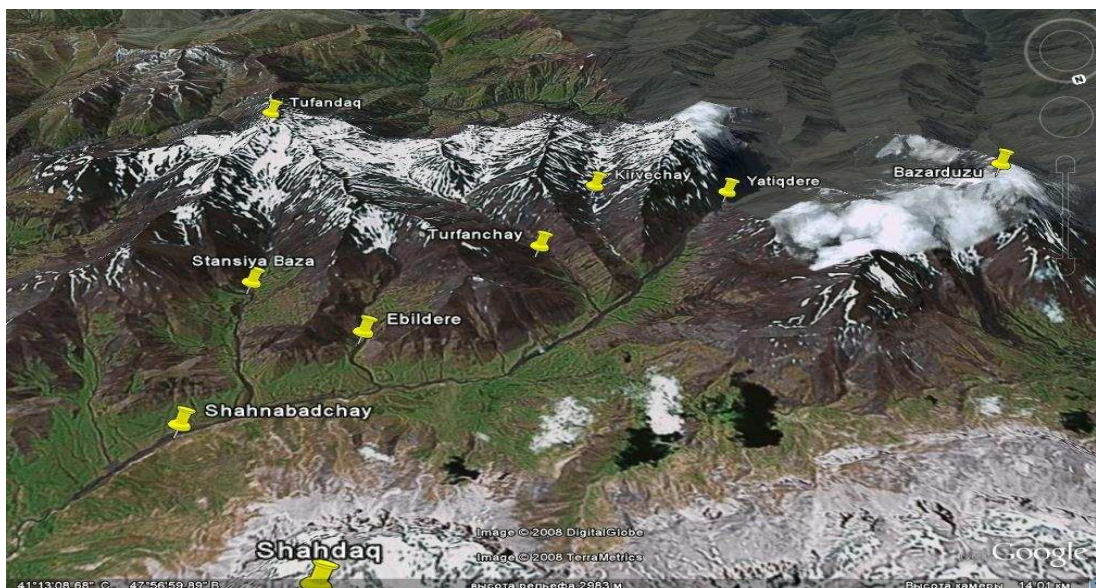
Araz water reservoir was completely filled up due to sharp rise in surface level of Araz river in first ten days of May **2007**. There emerged overflows in lower parts of Givrag and Araz water reservoir. As a result of shower rains (35 mm in five minutes) in mountainous area of Shahbuz region on May 27 at local time 21⁰⁰-23⁰⁰ a flood was observed in Bichanak and Garababa points of Nakhichevan river and subsequently, Yukhary Gishlag village was damaged considerably and 2 persons died in overflow. There emerged flooding and inundations in Asrik and Zayam rivers flowing through territory of Tovuz region as a result of shower rains on June 20 at local time 19⁰⁰, they resulted in damages to roads and bridges in up and middle reaches of the rivers and there appeared a flood in Chair river resulted from heavy rains in area of Slavyanka village of Gadabay region and as a consequence, 2 vehicles and newly constructed bridge remained under flooding and territory of the region were damaged considerably.

Due to shower rains (Guba 33mm, Khachmaz 23mm, Rustov 59mm, Gusar 38mm, Tangaalty 20mm, Kupchal 16mm) on July 8 **2008** at local time 20¹⁰, floods and overflows passed through the rivers of Gusar, Gudiyal, Valvala, Guru, Jaghajug, Gilgil. Level of water surface rised to 2 m. As a result, level meter units underwent to flooding, hydraulic works were damaged and some habitats, electric piles, roads and bridges suffered considerably, finally 1 person died in overflow. Due to shower rains (Dashkasan 24mm and Goygol 22mm) on July 8-9, floods and overflows passed through the rivers of Goshgar, Kurak, Dastafyurd and Ganja. As a result, level meter units underwent to flooding, hydraulic works were damaged, arable lands were out of use, telephone and electric piles were broken down, private cars turned over, roadways suffered and 1 military serviceman died in overflow while passing across the river. Level of water surface rised as 157 cm in Lankaran river, 105 cm in Sefidor river and 117 cm in Vasharu river due to shower rains (Dashdatuk 49.8 mm and Lankaran 25.6 mm) on October 2-3 (in the evening and at night). There emerged short-term floods in Pensar river flowing across territory of Astara region and subsequently 2 persons, i.e. mother and her child remained under floods while passing through footbridge. Horned livestock and bridges underwent to flooding in some villages.

Territory of Azerbaijan Republic is included in the list of areas, where floods and inundations are observed mostly along the world. Appearance of floods in Great and Little Caucasus mountain ranges which cover almost half of countrywide territory, occurs more intensively. Most floods and inundations happen in uplands of South slope of Great Caucasus and Nakhichevan AR. Countrywide economy suffers to the extent of 18-25 million USD because of floods occurred every year. The expected climate changes can cause serious difficulties in the future by increasing recurrence of floods and overflows.

Glaciers

Main glacier fields of Azerbaijan are situated in basin of Gusar river throughout Great Caucasus (Picture 1.3). It was determined as a result of studies carried out within the past 110 years that area of glaciers diminished to 2.4 km² from 4.9 km² in this period and at the present, their freezing level passes through average 3500m altitude elevation.



(Picture 1.3)

Underground waters

Underground waters constitute 24 million m³ in a day (8.8 km³ in a year) being formed in foothills of Great and Little Caucasus and plain areas, Nakhichevan and Talish ranges of the country. Presently, 5 million m³ or only 20% of overall resources are used in a day. It shows possibility of widely usability of underground water potential of the country in water deficiency period.

Hail

Most recurrence of hail precipitations is observed in uplands and foothills of Great and Little Caucasus. Agriculture plants mostly suffer from frequent hail-hits.

Strong wind

Orographic features of the area enable west winds to become stronger along Kura river basin and west coasts of the Caspian sea as well as east winds in the territory of Nakhichevan AR. An increase tendency of number of very strong windy days (more than 25 m/second) is observed in the republic within the last years according to statistic analyses carried out. So that within 2002-2008 maximum speed of wind in territory of the republic reached to 38-40 m/second in Baku and Absheron cities, Ganja-Shamakhy-Zardab-Zagatala regions (Alibay) in August 2005, in March 2006 and February, March, August, September 2007.

Temperature extremums

Temperature stresses adversely effects wildlife and vegetation. Exceedence of absolute maximums and minimums of air temperature were observed within past 15 years in the last century. Declining of minimum temperature in a considerable extent in winter led to damages for subtropic plants. Within 2002-2008 maximum air temperature in territory of the republic totalled to 40-43^o hot (July 2005, August 2007) in some Central Lowland regions, minimal temperature equalled to 14-17^o frost (February 2005, March 2006) in uplands. Minimum air temperature in Baku and Absheron peninsula was observed as 8.7^o frost in January 2008 that it is a record.

Fires

Deciduous/leaf bearing forests dominate mainly in Azerbaijan, therefore forest fires are not specific for the republic. But fires happened as a result of anthropogenous impacts can cause to extinction of various species of flora and fauna. Majority of fires occur due to burning of fields after corn reaping mainly in arid cycle. So that 7 forest fires happened in 2002 covered 46 ha area. But fire-fanging of hay, then trees appears in spring-summer seasons in Talish ranges. Six forest fires happened in 2007 covered 88.3 ha area, four forest fires in 2008 covered 25.3 ha area.

Surface fluctuation of the Caspian sea

Beginning from 1978 up to 1995 485 km² coast line of Azerbaijan remained under water at the result of the growth of sea level 2.5 m in the Caspian Sea. At the result of the growth of the level in the Caspian Sea the sea is re-polluted with the oil products. Biogenic elements, organic substance, and heavy metals amounts increase at the result of washing the areas under water or water pressure. Also there were changes in the estuary of the Kura; so in comparison with 1979 the thickness of the sludge grew 1.2-1.4 m. According to the modern research results high humidity will be kept in the Caspian Sea basin as the result of climate heating. If the level grows 150 centimeter, in the Caspian Sea 87,7 thousand ha will remain under water and it will occupy 1,6% of Azerbaijan area. At the result of expected growth at the Caspian Sea level is one of the important factors to influence the multiply of mine fish. The multiply of mine fish in the river will decrease; the quality of the water on the coastline will deteriorate and the places for spawning will get to worth in shallow coastal areas because of the growth in the sea level. Surface level of the sea equalled to -27,12 m Bsn in 2008. Surface level of the Caspian sea was remembered with large fluctuations within the history. Surface level fluctuations cause great damages to the economy of Azerbaijan Republic. According to opinions of some specialists, surface level of the Caspian can rise up as 1.2 m until 2020.

Barriers for effective implementation

1.2. Problem Analysis

1.2.1. Current status of biodiversity

Declining of countrywide biological diversity observed in the last years occurs due to human caused environmental impacts. In this standpoint, human impacts upon natural complexes can emerge in direct or indirect, open or closed, serious and nonsensitive way. Unsufficient use of soil and water resources impacts upon atmosphere and climate features and is related to overuse of them in many cases. Change in climate and atmosphere features effects upon function of ecosystem and subsequently, causes to decreasing of biodiversity.

At the present, very endangered and more sensitive ecosystems in Azerbaijan Republic are in Kura-Araz plains. Incorrect use of lands of these ecosystems resulted in erosion.

Semidesert areas of Absheron peninsula underwent upon more anthropogenous impact. Other ecosystems undergone strong human-caused impact are shared by mountainous ecosystems. Declining process of mountain forest lines accelerated considerably in the last decades. Cutting off forests, illegal and unefficient use of summer pastures led to intensification of erosion processes and multiple floods and slides. Azerbaijan is one of sparsely forested countries. Illegal use and loss of forestries cause to anxiety and trouble (for example, loss of tugai forests).

At the same time, construction of highways and pipelines in the areas enriched with biodiversity which resulted from countrywide economic development within the last years seriously impacts upon ecosystem by causing fragmentation, intensification of desertification and even local climate changes.

Intensive grazing of the pastures results in decreasing of vegetation and, stagnation and variation of plant species in ranges and subsequently, generation of poisonous and harmful grasses and enhancement of erosion processes and finally, degradation of proper ecosystem.

In addition, Azerbaijan's wetlands are significantly affected by anthropogenic impacts. Some natural lakes in Azerbaijan (such as Mehman, Garasu and Marso) have almost completed dried out as a result of over-extraction, and others have been severely impacted as a result of the construction of irrigation and drainage systems (such as Bozgobu and Sarisu lakes). Many of these lakes were once important breeding grounds for fish. Lowland lakes are generally fed from drainage channels (as the main rivers are regulated) and this increases their salinity, and dramatically impacts aquatic life, including fish. A number of these lakes are also polluted with outflows from industrial and domestic sources, and may be contaminated with oil from unsealed wells, the ecological situation of these wetlands is becoming acute.

The situation in the Caspian Sea is a matter of both national and international concern. As a closed system, this sea is particularly vulnerable to human impacts, and its biodiversity is at risk from a number of factors, including the recent accidental introduction of *Mnemiopsis leidyi*, pollution loads and over-fishing (particularly of valuable fish, such as sturgeon).

Disruption of balance in ecosystems leads to complete demolition of vegetation and animals being an integral part hereof. Areal of several valuable and economically important tree and plant species diminished considerably within the last 50 years caused by human activity. Besides, it is recommended to include 450 plant species and 220 animal species (total 670 species) to the Red Book of Azerbaijan which undergone to extinction. Disruption of natural habitats of animals lead to rapid extinction of a majority of them, especially invertebrates. Animals (such as striped hyena, namely *Hyaena hyaena*) from invertebrate ones accustomed to restricted areas undergo special danger. As a result of overmuch and unefficient use, wild vegetables and herbs, fruits and berries suffer, too. Particularly, en masse collection of herbs for sale encounter exhaustion of resources and some species for endangering.

Plant and animal species have also been affected by hunting and over-collection, and by the impacts of parasites and diseases.

1.2.2. Direct causes of biodiversity loss

Human activity underlies most of the causes of biodiversity losses in Azerbaijan, and humankind has significantly affected much of the land, through activities such as:

- **Land conversion**, predominantly for agriculture, but also for construction and industry, has reduced the area of natural habitat in Azerbaijan and results in fragmentation of the remaining landscape.
- **Land degradation**, resulting from overuse, erosion and fertilizer burdens reduces productivity and affects the likelihood of natural habitats reestablishing. It is estimated that 70% of pastures have undergone erosion, particularly the more fragile summer pastures.
- **Pesticide use**, particularly the legacy of high levels of application of toxic chemicals during the Soviet era, has resulted in long term pollution of some soils, and leaching into waterways. Pesticide use is currently under improved State control, however some illegal application of imported and unregistered pesticides is thought to occur.
- **Irrigation** has impacted much of the lowlands, and canals have fragmented much of the wider natural habitat, preventing free migration of animal species (especially as they lack appropriate bridges or escape paths for wildlife). Over recent years the collapse of these systems due to lack of repair has resulted in changes in the chemical composition of soil, increase in the ground-water level and gradual increases in salinity in some areas.
- **Water regulation**, including the construction of dams and management of water flows and extraction levels, has affected aquatic habitats significantly, particularly in the absence of adequate measures for protection of fisheries and other aquatic species
- **Pollution**, including the legacy from Soviet industry and agriculture, and ongoing pollution of waterways from domestic and industrial sources. In some cases older infrastructure relating to the oil industry is a source of pollution. The outflow of rivers into the Caspian Sea contributed to the pollution loads detected in the marine habitat.
- **Transport infrastructure** (including over 2,000 km of railway, 25,000 km of roads and 4,000 km of oil and gas pipelines) has caused habitat fragmentation, and represent barriers to the movement of wildlife, resulting in genetic isolation of sub-populations.
- **Over-use of biological resources** has been ongoing, with difficult economic conditions resulting in overexploitation of forests, medicinal plants and animals (including fish). Of particular note has been the decline in fisheries from both the Caspian Sea and inland waterways as a result of over-catch along with other factors such as water extraction and pollution. The sturgeon issue is one that requires international collaboration in order to prevent further over-fishing.
- **Invasive species**. Delivery of *Mnemiopsis leidyi* into the Caspian sea caused to extinction of tens of alevins and generally, feed provision of fishes.
Regarding plants adventitious weedery such as *ambrosia artemisiifolia* L., *cuscuta* L., *acrotilion repens* DC., *solanum rostratum* Dun spreaded out in countrywide flora and squeeze out the local species seriously.
- **Climate changes**. Global climate changes effect to countrywide biodiversity in any extent. As a result of overall climate warming, biodiversity more undergoes effect of stress factors by rising up of humidity index in some arid areas and by declining of cloudage and moisture

in other areas, at the same time climate changes result in serious change of hydrological regime of many rivers and lakes that it adversely impact upon water bioresources.

1.2.3. Underlying causes of biodiversity loss

A range of issues drive the ongoing decline of biodiversity in Azerbaijan, as in the rest of the world:

- **Economic development.** Over the last decade the Republic of Azerbaijan has seen major social and economic change, resulting from independence, economic downturn, and subsequent market reforms and recovery. The legacy of Soviet overuse of natural resources persists with regard to high pollution and pesticide burdens. In addition, the economic downturn affected the maintenance of infrastructure, including irrigation systems, leading to its deterioration and subsequent environmental impacts. The problems associated with market reforms, coupled with the costs of the Nagorno Karabakh conflict, resulted in reduced living standards for much of the population, and greater reliance on natural resource use.
- **Land use.** In order to feed the population and to support economic growth, significant areas of land have been converted from natural ecosystems to agricultural use. In addition, to this loss of natural habitat, other ecosystems are also affected by ongoing use – particularly with regard to grazing in lowland plains and mountain meadows. The lack of regulation of some grazing activities, and inappropriate use of meadow habitats, is contributing to soil erosion and changes in plant community compositions, which ultimately affect biodiversity.
- **Conflict.** The ongoing conflict with Armenia over Karabakh has contributed significantly to biodiversity declines. All terrestrial ecosystems have been affected – either directly or indirectly – by the conflict over Karabakh, which has resulted in destruction of extensive areas of woodland (mainly through fire) and ecological impacts to fauna and flora within the occupied territories. The occupation of territories by Armenian forces has resulted in a significant increase in refugees and internally displaced people (together representing around 1 million people or 12% of the population). The long-standing conflict has affected the country's economy and living conditions, resulting in greater exploitation of natural resources. Refugees and internally displaced people often live in temporary settlements, and rely on intensive grazing and use of fuel wood, resulting in local land degradation around these settlements. In addition, a number of the Strict Nature Reserves and significant forest reserves are located within the occupied territories.

1.2.4 Key sectors affecting biodiversity

A number of economic sectors directly impact biodiversity in Azerbaijan.

- **Agriculture.** Reform of the agricultural sector over the last few years has reduced its impact on biodiversity. Previously under the Soviet system productivity was maintained by extensive use of pesticides and mineral fertilizers, and through the establishment of extensive monocultures. However, a significant portion of Azerbaijan's land remains under cultivation, and the associated biodiversity is still directly affected (for example, the regulations in place to protect wildlife during harvesting are not always observed, fields are burnt after harvest, unregistered pesticides and inappropriate fertilizers are used; pastures are intensively grazed, and irrigation systems affect soil and water bodies).

- **Forestry.** In general, the area of forest continues to decrease in Azerbaijan, and species composition and structure of woodland is changing. Lack of sources of fuel (such as gas) result in a reliance on wood for fuel, which is probably the greatest impact on forest resources. In addition, timber is cut illegally for construction, which results in the removal of older trees from the forests.
- **Industry.** Although pollution from industrial sources has decreased over the last decade as the economic status of the country changed, the legacy of pollution from previous years remains a problem, with poor decommissioning procedures leaving behind untreated industrial waste and obsolete equipment.
- **Transport.** The density of roads and growth in the transport infrastructure (including canal construction) has resulted in greater fragmentation of the habitat. In addition, there is now a growth in pollution from vehicle emission sources.
- **Construction.** In many cases new buildings are constructed without appropriate planning or impact assessment, based on local regulations, without effective State oversight. As a result some houses have been built in inappropriate areas (for example in pipeline buffer zones, and on the protected shores of lakes and the Caspian Sea).
- **Oil Industry.** Oil extraction and refining industries have had significant effects on biodiversity and on the general environment. For decades ground (soil) tanks and open canals have been used to collect oil flowing from onshore wells and to ensure flow of oil to processing centres. The lack of the necessary technologies, inappropriate drilling regimes, poor maintenance and disregard of environmental protection measures have contributed to impacts in both onshore and offshore ecosystems. On the Absheron Peninsula 7,400 ha has been badly contaminated, and the legacy of earlier oil extraction remains in polluted lakes, soil and ground water. The extent of oil extraction and processing has now decreased and new technological processes have been introduced. However the State oil company is still considered to be a major contributor to atmospheric pollution, and the issue of waste water discharge into the Caspian Sea remains a cause for concern
- **Mining.** The mining industry affects biodiversity in a number of ways, including direct destruction of natural habitats (such as destruction of pastures for quarrying), widespread erosion and pollution, increases in the transport network, extensive slag heaps covering surrounding areas, coupled with lack of appropriate restoration of the lands. Mining activities affect significant areas of mountain habitats in particular, and these have been related to increasing erosion in these areas. Many of the by-products of mining contain heavy metals contaminate surrounding soils and water courses.
- **Tourism.** If unregulated, tourism can significantly affect natural habitats and species. Unplanned and inappropriate construction in natural areas (for example in coastal, forest or green zones), coupled with increased transport and development of new paths in ecologically sensitive areas, increased collection of rare plants and increased litter are all problems.

1.2.5. Restrictions on protection process

Main factors impacting upon protection and rehabilitation of biological diversity:

- Deficiency of financial opportunities;
- Lack of information on proper management methods;
- Weak and incomplete execution mechanism of the adopted laws;
- Low-level environmental conscious and culture of the population;
- Weakness of ecological education and enlightenment;
- Underdevelopment or absence of regional cooperation;
- Dullness of economic encouragement in protection of biological diversity;
- Delay of the country adherence to a number of necessary international conventions (Bonn Convention on Conservation of Migratory Species of Wild Animals, Rotterdam Convention on prejustified reconciliation procedure on international trade for several dangerous chemicals and pesticides).

1.2.6. Opportunities for biodiversity conservation

A number of developments will support further efforts to improve biodiversity conservation in Azerbaijan.

The Constitution of the Republic of Azerbaijan outlines the core principles of environmental protection, and the legislative basis for this has been put in place, along with an improved environmental management structure has been developed. The Constitution, which was adopted after a national referendum in 1995, sets out the principles of environmental protection, ownership of natural resources and the regulation of this sector. Since then the Milli Mejlis (Parliament) has further developed the legislative basis for regulating environmental protection, and around 20 laws have been adopted to bring the country in line with international standards on environmental protection.

The Government of Azerbaijan Republic pays great attention to solution of ecological problems, including protection and management of biological diversity. In this regard, lines of priority importance have been defined.

According to Convention of Biological Diversity of the United Nations, there established State Commission in order to fulfill obligations and commitments undertaken by Azerbaijan Republic and to ensure implementation of integrated measures for prevention of extinction danger of genetic resources of plants, animals and microorganisms.

“National Programme on Ecologically Sustainable Social-Economic Development” which aimed at protection of current ecological systems and economic potential and efficient use of natural resources to provide needs of the existing and future generations of Azerbaijan Republic and “National Programme on forest renewal and enhancement in Azerbaijan Republic” aimed at renewal of forests through regionalized species and increasing of quality and productivity and, enhancement of countrywide vegetation by planting new forests and greeneries through additional land plots which approved by Decree №1152 dated February 18, 2003 of the President of Azerbaijan, create wide opportunities for protection and conservation of biological diversity.

“National Strategy on protection and sustainable use of biological diversity in Azerbaijan Republic and Action Plan” approved by Decree №1368 dated March 24, 2006 of the President of Azerbaijan Republic seriously stimulated and promoted definition and execution of priority commitments.

The Ministry of Ecology and Natural Resources established under Decree dated May 23, 2001 and organized its countrywide activity efficiently. As evident from one fact, only total area of protected areas reached to 10.1% by increasing from 4.5% in relation to the country territory in the course of the Ministry activity.

About 60 NGOs from more than 400 ones established in the republic work for ecology sector.

(See: Annexes 9.1 and 9.2)

1.2.7. Further phases

This document was prepared based on the requirements of Convention of Biological Diversity and involves current status of biological diversity in the territory of Azerbaijan Republic and factors impacted upon it.

The report has been drafted in the presence of all concerned parties in view of their opinions and proposals.

Status, priority and timeline for key actions of the Programme of Work on Protected Areas

Status of key actions of the Programme of Work on Protected Areas

Status of key actions of the Programme of Work on Protected Areas	Status
• Progress on assessing gaps in the protected area network (1.1)	3
• Progress in assessing protected area integration (1.2)	3
• Progress in establishing transboundary protected areas and regional networks (1.3)	4
• Progress in developing site-level management plans (1.4)	3
• Progress in assessing threats and opportunities for restoration (1.5)	4
• Progress in assessing equitable sharing of benefits (2.1)	4
• Progress in assessing protected area governance (2.1)	4
• Progress in assessing the participation of indigenous and local communities in key protected area decisions (2.2)	3
• Progress in assessing the policy environment for establishing and managing protected areas (3.1)	3
• Progress in assessing the values of protected areas (3.1)	3
• Progress in assessing protected area capacity needs (3.2)	4
• Progress in assessing the appropriate technology needs (3.3)	3
• Progress in assessing protected area sustainable finance needs (3.4)	4
• Progress in conducting public awareness campaigns (3.5)	4
• Progress in developing best practices and minimum standards (4.1)	3
• Progress in assessing management effectiveness (4.2)	4
• Progress in establishing an effective PA monitoring system (4.3)	3
• Progress in developing a research program for protected areas (4.4)	3
• Progress in assessing opportunities for marine protection	2
• Progress in incorporating climate change aspects into protected areas	2

Status: 0 = no work, 1 = just started, 2 = partially complete, 3 = nearly complete, 4 = complete

(Insert notes as appropriate)

Priority actions for fully implementing the Programme of Work on Protected Areas:

(Insert priority actions)

Timeline for completion of key actions

National Strategy and Action Plan on Conservation and Sustainable Use of Biodiversity in the Azerbaijan have been implemented according to the Order of the President of the Republic of Azerbaijan, dated 24 March, 2006. Financial support has been provided by GEF5 for implementing of 2nd Action Plan on National Strategy and Action Plan on Conservation and Sustainable Use of Biodiversity in the Azerbaijan in 2011-2020.

Action Plans for completing priority actions of the Programme of Work on Protected Areas

(Insert detailed action plans)

Action 1: (Describe action)

Key steps	Timeline	Responsible parties	Indicative budget
Stocktaking and national target setting	2012-2020	Ministry of Ecology and Natural Resources	38000

Action 2: (Describe action)

Key steps	Timeline	Responsible parties	Indicative budget
NBSAP update	2011-2020	Ministry of Ecology and Natural Resources	97400

Action 3: (Describe action)

Key steps	Timeline	Responsible parties	Indicative budget
National frameworks for NBSAP implementation, CDB reporting and exchange mechanisms	2011-2020	Ministry of Ecology and	74000

		Natural Resources	

(Insert more as needed)

Key assessment results

Ecological gap assessment (insert summary findings if available)

Management effectiveness assessment (Insert summary findings if available)

Sustainable finance assessment (Insert summary findings if available)

Capacity needs assessment (Insert summary findings if available)

Policy environment assessment (Insert summary findings if available)

Protected area integration and mainstreaming assessment (Insert summary findings if available)

Protected area valuation assessment (Insert summary findings if available)

Climate change resilience and adaptation assessment (Insert summary findings if available)

(Insert other assessment results if available)