Integrated Biodiversity Management, South Caucasus

Rapid Assessment Report on Biodiversity and Ecosystem Services in Azerbaijan

REC Azerbaijan Limited

Report

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Executive summary

Azerbaijan's geographical location has provided a biological crossroad for animal and plant distribution from all directions over time. Changing climatic regimes, land masses and connections between the Caspian Sea, Black Sea and the Mediterranean Sea followed by isolation has also influenced the species composition that remains in this country today. In Azerbaijan now, European species like red deer (*Cervus elaphus),* brown bear (*Ursus arctos*) and lynx (*Lynx lynx*) coexist with Asian species like goitered gazelle (*Gazella subgutturosa*)and up until the last century, tigers (*Panthera tigris*). Due to its isolation from other bodies of water now, the Caspian Sea also contains a mix of endemic species including the Caspian seal and a number of economical valuable sturgeon species.
The Republic of Azerbaijan consists of six major ecological regions, with a variety of biomes contained in each. The main regions include:

- Greater and Lesser Caucasus Mountains
- Kur-Araz Valley andFloodplain
- Talish-LankaranZone
- AbsheronPeninsula
- Caspian Coastal Lowlands
- Nakhchivan Autonomous Republic

In accordance with the purpose of protection regime and country legislation, the protected areas in Azerbaijan have the following categories: State Nature Reserve, National Parks, Nature Park, State Nature Sanctuary, Nature Monuments and so on.

By 2001, there have been 14 State Nature Reserves and 20 State Nature Sanctuaries, with a total area of 478 000 hectares in the territory of our Republic. The area of specially protected natural areas was 4.5% of the territory of the country, and the total area of state nature reserves was only 2.2% of the territory of the country.

In order to conserve biodiversity and develop the PES, national programs and international programs/projects were implemented and are implemented in Azerbaijan. But these initiatives are not enough and sustainable.

Some direct threats to biodiversity and ecosystem have been singled out here as below:

- *Habitat loss and fragmentation;*

-*Unsustainable forest practices;*

-*Unsustainable livestock practices;*

-*Pollution of the Caspian Sea;*

- *Importation of exotic fish species for cultivation in natural and artificial ponds .*

There is a need to implement the awareness activities such as documentary movies, radio programs for prevention direct threats to biodiversity and ecosystems in Azerbaijan. Public awareness campaign on overgrazing, overstocking, pollution of waters, illegal fishing and other related topics should be carried out in Baku and regions of Azerbaijan and people will be informed people about importance and value of biodiversity & ecosystems and direct threats to them.

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List of Abbreviations

AR	Azerbaijan Republic
CBD	Convention on Biodiversity
CI	Conservation International
FAO	Food and Agriculture Organization of United Nations
GTZ	German Technical Corporation
MENR	Ministry of Ecology and Natural Resources
NGO	Non-Governmental Organization
NP	National Park
PES	Payment for Ecosystem Services
UNDP	United Nations Development Program
WB	World Bank
WWF	World Wide Fund for Nature

1. Introduction

Current assessment report has been prepared by REC Azerbaijan Limited in the context of the assignment “Support international consultant in the development of a concept for a public awareness campaign and the content for each of it elements”. The assignment is part of Integrated Biodiversity Management, South Caucasus (IBiS) programme, which is implementing by the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH on behalf of the German Federal Ministry of Economic Cooperation and Development (BMZ) with co-funding in Armenia and Georgia from the Austrian Development Cooperation (ADC).

The purpose of this report is to describe current situation on biodiversity and ecosystems in Azerbaijan in order to develop concept for public awareness.

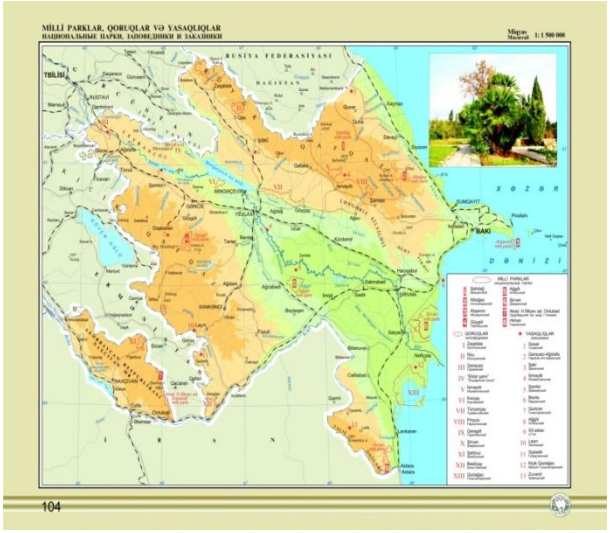
The report gives general information on biodiversity& ecosystems in Azerbaijan including species diversity, agro diversity, protected areas, forests, water resources (wetlands), agricultural lands, as well as threats to biodiversity &ecosystems and recommendation addressing these mentioned direct threats.

Current report is based on desk study and have been prepared by studying the available information, conducted studies and issued expert reports on biodiversity and ecosystem services in Azerbaijan.

2. Biodiversity& Ecosystems in Azerbaijan

2.1 Biodiversity

Since establishment of the MENR, it has always implemented purposeful measures in the direction of biodiversity conservation, protection and learning of the genofund of rare plant and animal species, and attained certain consequences in this field in a short time. Specifically, specially protected territories have a necessity for creating unified management network due to the expansion of the areas, meanwhile, the number of them. The role of specially protected areas is great in conserving biodiversity, organizing protection of rare and endangered plant and animal species, maintaining nature as a whole.



In order to be appropriate for contemporary requirements (protection of all important ecosystems and main species, creation of corridors and conservation areas) of specially protected nature territories system that available in the Republic, a number of events have been carried out. It has become possible to conserve rare and endangered fauna and flora species, keep anthropogenic effects away from the areas with captivating aesthetic beauty, as a result of creation of specially protected nature territories in the country and organization of activities through defining their institutional authority precisely. The majority of specially protected nature territories established has dwelled with the fauna and flora species that Red Book includes and specially taken as one of the key factors.

Regards national policy on biodiversity, *"National Strategy and Action Plan of the Republic of Azerbaijan on Conservation and Sustainable Use of Biodiversity", a*pproved on 24th of March 2006 by Order 1368 of the President of the Republic of Azerbaijan, has provided an extensive perspectives for establishment of new specially protected nature areas in the country through the commitments that meant to conserve biodiversity and develop specially nature protected territories and to determine priority ecosystems.

"National Strategy and Action Plan on the Conservation and Sustainable use of Biodiversity in the Republic of Azerbaijan" has given a serious impetus to the activities on the directions of a number of commitments, including the protection of biodiversity and the development of specially protected natural areas, prioritization of ecosystems and elimination of desertification problems. In accordance with the Article 1.1.3. of the Order, Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and National Academy of Sciences have been assigned to organize the publication of "Red Book" of the Republic of Azerbaijan..

At present, "Red Book" of the Republic of Azerbaijan is carried out based on the Law of Republic of Azerbaijan No 675-IN of June 4, 1999 "On the Animal World" and the Law of the Republic of Azerbaijan No 678-IN, dated June 8, 1999, "On Environmental Protection". According to the current legislation, rare and endangered plant and animal species, living in natural conditions in the territory of the country, are specially protected, and included in the

“Red Book” of the Republic of Azerbaijan. the “Red Book” of the Republic of Azerbaijan, as an official document, contains information on the condition, spread and protection of animal and plant species (subspecies, populations) in the whole territory of the Republic of Azerbaijan, including the section of the Caspian Sea (Lake) belonging to the Republic of Azerbaijan.

“The National Strategy on Protection and Sustainable Use of Biodiversity in the Republic of Azerbaijan for 2017-2020” was approved by the Order of the President of the Republic of Azerbaijan, dated on 3 rd of October 2016. The Action Plan on Implementation of the Strategy has been approved to ensure the acceleration of the implementation of “The National Strategy on Protection and Sustainable Use of Biodiversity in the Republic of Azerbaijan for 2017-2020”.

Over the past period, information about activities carried out by relevant government agencies, as well as structural units of the Ministry on the “Action Plan”, has been collected periodically.

Implementation of activities in the direction of efficient use of genetic resources, biodiversity conservation and delivery to the next generations, poverty eradication, regulation of ecological balance, improvement of ecological situation and its sustainable development, transition to “green economy”, stimulation of environmental education, reduction of pressure on diversity of endemic flora and local fauna species are the main goals of the National Strategy and Action Plan, which will cover the period 2017-2020.

Within the implementation of the paragraph 1.4.2. of the Decree No.166 of the President of the Republic of Azerbaijan, dated May 15, 2014, “On the application of the Law of the Republic of Azerbaijan on April 4, 2014, No. 924-IN” on amendments to the Law of the Republic of Azerbaijan “On Specially Protected Nature Areas and Objects” , relevant works are being carried out in order to create sanitary protection of Shirvan, Goy-gol, Hirkan National Parks, Shirvan, Korchay, Eldar Pine, Turyanchay and Garayazi state nature reserves. The map of the land area to be included in sanitary-protection zones of Shirvan, Korchay and Eldar Pine state nature reserves and Shirvan National Park has already prepared and is in the stage of agreement with the relevant state authorities.

2.1.1 Agrobiodiversity

Agriculture in Azerbaijan has a long history. For thousands of years, local farmers have been cultivating domestic crops such as wheat, barley, oat, rye ,and grain legumes(pea, chickpea, lentil, fava beans).

Indeed, Azerbaijan has a rich flora of crop plants, both in terms of number of crop species as well as in terms of intraspecific variability. There are numerous endemic cultivated taxa. The variability within crop species is significant and well documented for some indigenous varieties (Triticum spp., Vitisvinifera.) as well as for introduced species (Phaseolus vulgaris, Glycine max, Zea mays). Wild relatives of crop species are also important in Azerbaijan. A wild cultivar of beetroot (Betta) was recently discovered.

However, Azerbaijan's rich agrobiodiversity is threatened by the introduction of cultivars of a few popular species, and by the erosion of traditional knowledge and practices for conserving agrobiodiversity.

2.2 Ecosystems

The Republic of Azerbaijan consists of six major ecological regions, with a variety of biomes contained in each. The main regions include:

- Greater and Lesser Caucasus Mountains
- Kur-Araz Valley andFloodplain
- Talish-LankaranZone
- AbsheronPeninsula
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Greater and Lesser Caucasus Mountains

Although these two mountain ranges are geographically separated, they contain similar soil types, climate, and flora and fauna and are considered together. In Azerbaijan, these mountains vary from 300 to more than 4400 meters high with different vegetative types typical of different altitudes. About 80 % of Azerbaijan mountain forests consist of Oriental beech (*Fagusorientalis*) with some maples (*Acer trautvetteri*) mixed in. Many other forest types exist, depending on altitude, exposure and other environmental conditions. Lower altitude slopes, if intact, are generally covered with deciduous hornbeam (*Carpinusorientalis)*, sweet chestnut (*Castanea sativa*), ash *(Fraxinus excelsior*) and others. A variety of higher plant species, many of which are endemic to the Caucasus mountains, are found within these forests. At higher altitudes trees are replaced with rhododendron (*Rhododendron caucasicum*) shrubs and grassy meadows that often provide summer pastures for domestic sheep and goat herds. A number of Caucasian endemic species including Caucasian turs (*Capra cylindricornis)*, Caucasian black grouse *(Tetraomlokosiewiczi)* and many plants are found in these mountains. At lower altitudes, mountain steppes cover the landscape. Non-grazed areas are often covered with dry scrub forests of juniper, and wild pistachio (*Pistachiamutica*), almond (*Amygdalusfenzlianum*), Caucasian pear (*Pyruscaucasicum*), Oriental apple (*Malusorientalis*) and other trees that are distant relatives of cultivated species. Much of the lower altitude steppe land is used for pastureland, fruit orchards and other crops.

Kur-Araz Valley and Floodplain

The Kur River flows across central Azerbaijan from the mountains bordering Georgia, and this river is joined by the Araz River that flows along the Iran border, forming a broad floodplain as the water flows to the Caspian Sea. A few areas of remnant riparian forests (here, called tugay) that have not been cut or flooded due to anthropogenic water regimes

line the river banks, with characteristic wing nut (*Pterocaryapterocarpa)*, oak (*Quercuslongipes*) and white poplar (*Populus alba*) trees. Most of the floodplain area consists of dry steppes with semi-desert vegetation dominated by grass, thorny shrubs and wormwood (*Artemisia fragrans*). Irrigation has opened this dry land to agriculture and grain crops and sheep winter pastures dominate the scene. Part of the Araz floodplain is in Nakhchivan Autonomous Republic with similar species composition.

A number of large reservoirs and smaller natural lakes along the Kur River and surrounding seasonally inundated areas form significant wetland habitat for migratory and breeding bird populations. The largest reservoirs, including Mingachevir (60,500 ha), Araz (14,500 ha), Shamkir (11,500 ha), Yenikend (2,300 ha), Varvara (2,200 ha) and some others have water up to 158 meters in depth, but natural lakes (Sarisu, Aggol, Makhmudchala, Hajigabul, Ajinohur etc.) and ponds are very shallow (2-6 m) with maximal size up to 11,000 ha (Sarisu). Wetland plant communities are dominated by reeds (*Phragmitescommunis*), cattails (*Typhaangustifolia*) and underwater plants with large biomass providing food for hundreds of thousands of ducks, swans, coots and other resident and migratory bird species. A number of the waterfowl using these wetlands are internationally threatened.

Talish-Lenkeran Zone

The southeast corner of Azerbaijan, bordering the Caspian Sea and Iran, is a unique mixed landscape, including the Talish Mountains which rise above 2000 meters adjacent Lenkeran lowlands and wetlands and a climate unusual for Azerbaijan, with dry summers and heavy precipitation the rest of the year. Relict forests in this zone include species that originated in the Tertiary period, including many endemic species of trees, otherhigherplantsandinsects.Forestshereincludechestnutleafoak(*Quercuscastanifolia)*,Caucasianelm (*Zelkovacarpinifolia)*, Caucasian persimmon (*Diospyros lotus),* Lenkeran acacia (*Akaciajulibrissina*) and a number of endemic species of plants. Large animal species in these forests include bear, lynx, American raccoon (*Procyonlotor*), and red deer *(Cervuselaphus*). Much of the land has been modified for agriculture, including grapes, citrus and other tropical fruits and for cattle grazing.

Absheron Peninsula

The Absheron Peninsula is dominated by the city of Baku which is increasingly stretching its boundaries and swallowing the arid lowlands that until recently hosted large numbers of grazing sheep and goats and irrigated cropland. Oil operations are widely evident on the peninsula. Natural lakes, small hills and mud volcanoes provide geographic relief. Waters on the northern side of the peninsula are said to be cleaner than those on the southern shore where the residuals from a number of oil platforms sometimes contaminate the shoreline. Caspian seals (*Pusacaspica*) sometimes haul out on beaches at the tip of the peninsula and it forms a breeding ground for many gull and tern species.

Caspian Coastal Lowlands

Azerbaijan has 800 km of coastline along the world's largest inland body of water, the Caspian Sea. Due to its long isolation from other water bodies, a number of endemic

species have proliferated in this brackish water lake, accounting for about 40% of the species living here. The Caspian seal (*Pusacaspica*) and a number of species of economically important sturgeon fish are notable Caspian residents. Changing salinity due to influxes of water from surrounding rivers provide harsh living conditions that few species can adapt to, resulting in a low amount of biodiversity, aside from the endemics. Wetlands surrounding the Caspian Sea are important wintering, breeding and migratory areas for many globally threatened waterfowl species. Periodic flooding of the lowlands near the Caspian Sea has resulted in salinifisation of much of the land, deterring its use for agriculture and much of the habitat remains as semi- desert with some use for sheep grazing.

Nakhchivan Autonomous Republic

The Nakhchivan Autonomous Republic is a part of Azerbaijan, separated from the main part of the country by Armenia. In biodiversity and terrain it is more similar to adjacent land in Armenia, Iran and Turkey than it is to the rest of the country. The land is very dry and ranges in altitude from 600 m to about 3500 m. Due to the arid climate, desert steppe rises higher up the mountains than in other parts of Azerbaijan, and trees, mainly mountain oaks (*Quercusmochzantera*) begin at about 2000 m, where more moisture is available. Most plants are similar to those in neighboring countries, and in much of the rest of Azerbaijan. Leopards roam the mountain steppes and slopes and bezoar goat *(Capra aegragus)* and mouflon sheep (*Ovisarie*) are found here but are rare elsewhere in Azerbaijan.

2.3 Protected areas

In accordance with the purpose, protection regime and country legislation, the protected areas in Azerbaijan have the following categories: State Nature Reserve, National Parks, Nature Park, State Nature Sanctuary, Nature Monuments and so on.

By 2001, there have been 14 State Nature Reserves and 20 State Nature Sanctuaries, with a total area of 478 000 hectares in the territory of our Republic. The area of specially protected natural areas was 4.5% of the territory of the country, and the total area of state nature reserves was only 2.2% of the territory of the country.

As a result of the work carried out in 2003-2013, the total area of protected area in our country has reached 892546.49 ha, including 9 national parks, 11 state natural reserves and 24 state nature sanctuaries. In general, specially protected nature areas constitute 10.3% of the territory of the country, including national parks – 3.7%.

The current legislation of the Republic of Azerbaijan defines broad perspectives for both local and international businessmen by identifying the organization of tourism and recreational activities in the territory of National Parks, unlike other specially protected nature areas.

Thus, different types of nature usage are permitted in tourism and recreational zones definied in the territories of National Parks for tourism and recreation purposes, in accordance with the Law of the President of the Republic of Azerbaijan of March 24, 2000 “On Specially Protected Nature Areas and Objects”, the “General regulations of National Parks of the Republic of Azerbaijan” approved by the Decree of the President of the Republic of Azerbaijan and the Decision No 114 of 21 April 2015, On the Procedure of use, payments

and the amount of payments for scientific, cultural, educational, tourism and recreational, limited economic purposes from specially protected nature areas and objects".

2.4 Forests of Azerbaijan

Forests are considered as one of the most valuable and also vulnerable natural resources in Azerbaijan. Forests of Azerbaijan are state-owned, and fulfilling protection functions and they are included in the first group forests. Small part of forests are owned and managed by local municipalities.

There are 450 species of trees and shrubs in the Azerbaijani forests. The difference of this biological classification is connected with the diversity of natural conditions of Azerbaijan. Despite of the variety of forests, the main forest-forming species are broad-leaved forests. They are mainly consisted of beech, oak and hornbeam.

FAO studies has divided the various ecosystems of Azerbaijan into 5 ecological zones:

- temperate mountain;
- temperate continental forest;
- temperate desert;
- subtropical mountain and
- humid subtropical forests.

The total area of Azerbaijani forests is 1021.0 thousand ha which is 11.8 % of the country area. 49% of the forest reserve of the country falls to the share of the region of Caucasus Major, 34% to the region of Caucasus Minor, 15% to the Talysh zone, 2% to the Aran (lowland) zone (including Nakhichevan AR). The forest area per capita is 0.12 in Azerbaijan. Currently, 261 thousand ha forest fund is under occupation of Armenia.

95% of the forests of Azerbaijan are located in the mountains and foothills, while 5% in the low-lying areas. The forests perform mostly the functions of soil protection, water storage, climate control, microclimate creation, biodviversity shelter, carbon sinks and etc.

It is obvious that forecasted climate change will have significant impact to forest ecosystems. These impacts could be listed as below:

- Climate change will result in ecosystem shifts and conversions that will also affect forest ecosystems;
- Climate change will result with "heat stresses" and many tree species will have insufficient resistance to cope with climate change;
- Climate change impacts on forests will impair the ability of many forested watersheds to produce reliable supplies of clean water;
- Climate change will result in a widespread decline in carbon storage in forest ecosystems;
- Climate change will amplify many existing stressors to forest ecosystems, such as invasive species, insect pests and pathogens;
- Increased temperatures will increase risk of forest fires.

Local forests of Azerbaijan play first of all environment-forming and nature-protecting roles. Because of the expected climate change this role of forests will increase. Climate change impact to local forests of Azerbaijan may be elaborated as following:

- Increasing temperatures will results with “heat stresses”, especially in summer season, that will negatively impact some tree and bush species leading to “shock” cases in growing period (such cases mostly forecasted in realization of GISS və GFDL-3 scenario models);
- Increase of temperature will result in changes in vegetation period and could be also lead to some positive results;
- As a result of changes in hydrologic cycles will lead to heavy rainfall and increase in flood caseses that will result with erosion and land degradation at mountain-forest ecosystems. In some cases it will positively impact the floodplain forest areas;
- As a result of glacier melting and reduce in the snow level will negatively impact flora and fauna in forest ecosystems;
- Increased aridity due to climate change combined with anthropogenic impact (overgrazing) will make highly negative impact to forest ecosystems;
- Extreme high temperatures, increased number of days with high temperatures and increased evaporation will lead to increased forest fire cases;
- Increased number of “heat stresses” will lead to increase of plant diseases, mainly in floodplain forests;
- Loss in biodiversity and biotic risks will increase;
- On the other hand, when having sufficient humidity increased carbon concentration in ambient air will positively affect growing of some tree species and increase carbon removal.

2.5 Direct threats to biodiversity

Habitat loss and fragmentation. Although significant areas of natural habitat remain, recent declines in available habitat threaten the persistence of some of Azerbaijan’s most distinctive biodiversity. Deforestation and habitat fragmentation is a growing problem throughout the Caucasus. Easily accessible forests, such as those occurring mountain river valley sand riparian forests, have been the hardest it. Riparian forests, dominated by *Quercuslongipes*and *Ulmuscarpinifolia*with a mixture of *Celtiscaucasicum*, have suffered significant destruction and degradation.

In addition, wetland habitats have suffered from drainage for agricultural and urban development, as well as oil exploration, peat extraction, and gravel mining. In addition to their unique plant and animal communities, wetlands provide critical habitat for migratory and wintering birds.

Caves that support large colonies of up to several thousand bats, including Red Data Book species, are being used as ammunition depots in the disputed area of the country, with consequent declines in bat populations.

Unsustainable forest practices*.* In the Soviet era, forests were managed principally for protection and recreation, with timber and timber products being imported from Russia. Since independence in 1991, Azerbaijan's forests have been particularly hard hit due to poor management, with widespread, the latter driven by the acute energy crisis during the winter months.

Illegal logging leads to decline in species composition, forest degradation and overall habitat loss, impacting a number of plant and animal species. Fuel wood harvesting and consumption lead to forest degradation and disappearance of certain species and contribute to forest fires and global warming. .

Unsustainable livestock practices*.*The rangelands (alpine meadows and lowland steppe communities) of the Eastern Caucasus have been overgrazed by sheep. Unsustainable range management, mainly by overstocking, has been intensified by the repopulation of high mountain villages,starting in the late 1980s. In subalpine meadows, overgrazing and associated disturbance is contributing to declines in wild goats (*Capra spp.*) and chamois (*Rupicaprarupicapra*). In the low land grasslands, where the same domestic sheep move to winter pasture, severe overgrazing is significantly impacting the endemic flora and fauna of steppe communities. Such competition for grazing has contributed to the decline of Persian gazelle (*Gazellasubgutturosa*) and, indirectly, the striped hyaena(*Hyaenahyaena*).

Traditionally, sheep were grazed on alpine meadows, with subalpine meadows reserved for fodder production and used during the winter months. Currently, traditional grazing grounds in the north Caucasus (Dagestan, Georgia) are no longer accessible, and livestock is kept nearer to villages all year round, resulting in overgrazing of the subalpine meadows as well as degradation of fragile subalpine woodland ecosystems.

Pollution of the Caspian Sea*.*Oil exploration and production have dominated Azerbaijan's economy since the early 19th century. As onshore deposits were exploited, infrastructure for production, refinement, and transport significantly effected the littoral ecology of Azerbaijan's Caspian shoreline, particularly around Baku. Today, the legacy of decades-old inefficient production systems and crumbling infrastructure can be seen in the effects of widespread and severe oil pollution. In the post-Soviet era, western oil companies have invested primarily offshore (at least 50 km) and have adopted modern environmental control and monitoring procedures. However, oil spills from state-owned oil companies are depressingly regular since the withdrawal of Soviet support. Public awareness of this situation was raised in the late 1980s by the plight of the Sumgait terminal area, which was declared a "dead zone." Efforts to mitigate environmental pollution in Sumgait, Baku, and elsewhere have increased in recent years, but the magnitude of the problem remains severe and the costs of rehabilitation are dauntingly high. In addition to oil pollution in the Caspian Sea itself, high levels of nutrients from agricultural runoff and indiscriminate industrial and municipal discharges into those rivers (notably the Kura river) that empty into the Caspian Sea also contribute to increased pollution levels in the Sea.

The Caspian Sea Monitoring Station is responsible for monitoring the quality of water and subs oils of the Caspian Sea, as well as control and enforcement of environmental licensing. The

Hydrometeorogical Committee also operates monitoring stations, checking sediments for dissolved oxygen, oil, phenols, and heavy metals (notably mercury). Explicit monitoring of biodiversity has begun only recently with the arrival of western oil companies, and has focused on their own off shore stations. Baseline data do not exist. However, recent declines in the Caspian Sea sturgeon fishery have been linked to the decline in the benthic (bottom-feeding) biota of open waters.

Exotic species*.* The importation of exotic fish species over the past decades for cultivation in natural and artificial ponds has threatened the diversity and abundance of native fish species. In Azerbaijan today most inland lakes, many of the rivers and the Caspian Sea itself have lost most of the native fish species. In the Caspian Sea the invasive jellyfish species *Mnemiopsisleidyi* has also become widely established leading to a decline in plankton and fish larvae. One botany professor states that there are about 1000 invasive plants in Azerbaijan. Some exotic invasive plants are said to be a problem in Azerbaijan, such as *Atraphaxisspinosus* that has taken over much of the semi-desert lands used for sheep grazing. These plants are thorny and inedible and their seeds foul the coats of sheep, reducing the quality of the wool.

3. Ecosystem services practice in Azerbaijan

The concept of ecosystem services is not fully adopted in Azerbaijan. At the Ministerial level, there was no initiative to initiate this concept. Initiatives are only limited by the internationally supported projects which are not sustainable at all. There is a need for significant awareness raising activities in order to create the capacity on this topic.

At a basic level, the development of Payment for Ecosystem Services (PES)-related legislation should focus on solving the existing challenges of PES deals. When introducing new or revised legislative text, policy-makers need to balance the goals of guiding PES development and implementation on the one hand, and making only a minimum of interventions/changes in the legislation – especially in those with an already well-developed and often complicated legislation in place – on the other hand. If policy-makers and legislators do not find the right balance, they run the risk of either creating overregulation and bureaucracy which could hinder the success of PES, or missing an opportunity to develop regulated and trustworthy markets.

As it was mentioned above, at present, there is n intention from the government to initiate PES application for ecosystem resources in Azerbaijan. There are some reasons underlining the emerging situation:

- Very low knowledge on concept of PES of decision-makers and administrators responsible for biodiversity resource management;
- Current financial system of biodiversity management structure does not promote PES application;
- Legislative framework also does not promote PES application;
- Government bodies responsible for biodiversity conservation mostly focused on protection rather than to explore additional financial resources

There is a need for detailed assessment on PES opportunities of ecosystems in Azerbaijan. The assessment should also focus on gaps in legislative framework and urgent capacity/training needs. Of course, initial step in this direction should be targeted public awareness activities.

4. Implemented and on-going projects related to biodiversity conservation/ecosystem services in Azerbaijan

There are two related national programs, the National Programme for Ecologically Sustainable Social-Economic Development in Azerbaijan Republic and the National Programme for Restoration and Extension of Forests. In total, up to 40 international programs were implemented by MENR including eight that at least indirectly concerned the protection of biodiversity. The few most relevant to biodiversity include a project for Creation of Samur-Yalama and Shahdagh National Parks, the construction of fish nurseries for sturgeons for wild release, announcement of Hirkan forest as a potential World Natural Heritage Site, preparation of an Action Plan for Nature Conservation, and analyzing the Ecosystem of Caspian Sea.

Donor	Description	Geographic Focus	Dates
WB	Preparation of National Environmental Action Plan	Azerbaijan	1996
UNDP	Preparation of State of the Environment Report	Azerbaijan	1997
EU-Tacis	Regional Environmental Awareness Raising Program	Caucasus	1999
CI	WWF Grant program for national and international NGOs to conserve Caucasus biodiversity	Caucasus	2005-2009
WB/GEF, Japan and Azerbaijan Government	Creation of Shahdag National Park	Azerbaijan	2006-2009
EU	Sustainable Land Management for Mitigating Land Degradation and Reducing Poverty in the South Caucasus Region		2008-2012
OSCE	Civic Action for Security and Environment (CASE) Programme for Azerbaijan	Azerbaijan	2009
EU	Fostering Community Forest Policy and Practice in Mountain Regions of the Caucasus		2009-2012
Germany (GTZ)	Sustainable Management of Biodiversity in South Caucasus	Caucasus	2009-2016
EU	Identification and implementation of adaptation response to Climate Change impact for Conservation and Sustainable use of agro-	Caucasus	2011-2013

	biodiversity in arid and semi-arid ecosystems of South Caucasus		
EU	Support Development of Biodiversity Conservation Policies and Practices in Mountain Regions of the South Caucasus	Caucasus	2012
Norwegian Embassy	Mainstreaming the Payment for Ecosystem Services for Green growth in South Caucasus" funded by Ministry of Infrastructure and Environment of the Netherland.	Caucasus	2014
Caucasus Nature Fund	Implementation of logistic services within Shirvan-Hirkan National Parks	Azerbaijan	2014-2015
TJS	TJS supported program on Financial Participatory Approach for Aggol and Shirvan National Parks 2017-on-going	Azerbaijan	2017-on-going
WWF	WWF regional project on Ecocorridors implemented at Shahdag NP	Azerbaijan	2017-on-going
WWF	WWF project on raising awareness on biodiversity conservation at local communities around Shrvan and Shahdag NP	Azerbaijan	2015-2016
WWF	WWF project on capacity building of staff of Shrvan and Shahdag NPs on ecosystem services and biodivesirty conservation	Azerbaijan	2015-2016

5. Public awareness measures on biodiversity/ecosystem services

In the Ministry of Ecology and Natural Recourses Ecological publicity department was established to provide public education and enlightenment on protection of environment. Within the department Public relations and publicity sector was established

Main duties of this department is to provide participation in publicity policy of the Ministry and to give proposals on education, publicity and agitation concerning protection of environment and nature, provide propagation of enlightenment, ecological education and humanist attitude to nature, to give proposals in making posters and booklets, to provide information exchange with NGOs concerning ecology and natural recourses.

The sector ensures enlightenment of the public on ecological matters, proper assistance is provided to Territorial Ecological and Natural Recourses department in ecological publicity issues, regular meetings and press conferences are organized to provide the public with information on activity of the Ministry.

Public awareness activities are conducted through media, TV, social media, web portals and different types of events (fairs, trainings, seminars).

Publicity Department of the Ministry is always open to collaboration with public, private and international stakeholders involved to environmental issues.

There are also public awareness activities implemented in collaboration with national and international non-governmental organizations. In this case, activities are mainly are project based. MENR still provides overall coordination of conducted public awareness activities.

6. Conclusions

1. Public awareness campaign on overgrazing, overstocking through radio programs (see: Annex F) and other awareness means (such as posters, short animation video clips and etc) should be carried out mainly in the regions of Azerbaijan and be informed people about importance and value of biodiversity & ecosystems and direct threats to them.

2. Concept of ecosystem services is not fully adopted in Azerbaijan and there was no initiative to initiate this concept at the Ministerial level. Initiatives are only limited by the internationally supported projects and there is a need for significant awareness raising activities in order to create the capacity on this topic.

3. Illegal commercial logging for furniture and building material needs to be addressed with strong measures such as control posts on road, strong penalties and information in mass media about each infraction.

4. More information is needed to effectively allocate and manage legal logging operations in Azerbaijan. Special projects are needed to identify the real number of harvested trees every year, especially in most vulnerable areas.

5. It needs to be prepared and broadcasted a documentary film concerning biodiversity & ecosystems conservation and above mentioned threats, including logging and fuel wood harvesting problem.

6. . Where the climate and growing conditions are suitable for forest regeneration or replanting, efforts should be made to increase forest cover.

7. Monitoring projects are needed to identify the real extent of the damage from illegal fishing and also to set better guidelines for commercial fishing operations.

8. A monitoring system for oil spills in the Caspian Sea along oil pipelines, and in terrestrial oil fields around wetlands that involves international and local experts is needed.

9. Water quality standards in Azerbaijan need strengthening and infractions should be punished. A monitoring system of rivers and the coastline involving NGOs, scientists, and the mass media is needed to identify problems and make people aware of them.

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8. Appendices

8.1 Consultations with Ministry of Ecology and Natural Resources

On October 12, 2017 REC Azerbaijan Limited staff, employees of GIZ and international consultant under the assignment "Support international consultant in the development of a concept for a public awareness campaign and the content for each of it elements" met with Department of Biodiversity and Environmental Awareness of the Ministry of Ecology and Natural Resources.

During the meeting Ministry of Ecology & Natural Recourses was informed about mentioned assignment and public awareness campaign, which will be carried out under this assignment.

At the meeting all planned public awareness activities was presented to Ministry of Ecology by international consultant Friederike Lemme through presentation.

Ministry of Ecology expressed its wish to cooperate with GIZ under this assignment and according to mutual consent Ministry would prioritize and present the list of priority activities willing to give organizational support during a week. After this meeting, as intermediary, REC liaised with Ministry of Ecology in order to submit above-mentioned list of priority activities to GIZ.

List of priority public awareness activities supporting by Ministry of Ecology:

1.Documentary movie

2.Short movies

3.Infographics

4.Interactive competitions

5. Radio programs

Slogan of all awareness campaign:

1. Azerbaijan-my home/your home and my nature/your nature
2. Azerbaijan-homeland and nature treasury
3. My nature-my treasury

Dissemination means of mentioned activities:

1.Documentary movie- through TV channels

2.Short movies- through social media (i.e. Facebook of MENR)

3.Infographics- through websites and social media (i.e. Facebook of MENR)

4.Interactive competitions- through websites and social media (i.e. Facebook of MENR)

5. Radio programs- through radio channels

8.2 Script for 5 radio programs

No:	Topics	Subtopics
1st radio program	Biodiversity	• General information about biodiversity • Current situation of biodiversity in Azerbaijan • Biodiversity conservation/how to prevent threats to biodiversity
2nd radio program	Ecosystems	• General information about ecosystems • Ecosystems diversity in Azerbaijan (Forest ecosystems; Grassland and desert ecosystems; Mountain ecosystems; Wetland ecosystems; Coastal and marine ecosystems) • Payment for Ecosystem Services (PES) • Ecosystem conservation/direct threats to ecosystems
3rd radio program	Forests	• Forest areas in Azerbaijan • Value of forests • Current situation of the forests/ Deforestation and habitat fragmentation
4th radio program	Lands (or pastures)	• Land areas in Azerbaijan and its use as pastures • Current situation of summer & winter pastures • Negative impacts of overgrazing to biodiversity • How to prevent overgrazing/mitigation measures
5th radio program	Water resources	• Water resources of Azerbaijan • Current situation of waters /Pollution problem • Pollution of Caspian Sea • Direct threat of pollution to people and fish species • How to prevent pollution

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