EUROPEAN NEIGHBORHOOD AND PARTNERSHIP INSTRUMENT EAST COUNTRIES FOREST LAW ENFORCEMENT AND GOVERNANCE II PROGRAM

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TEEB Scoping study for forestry sector of Azerbaijan

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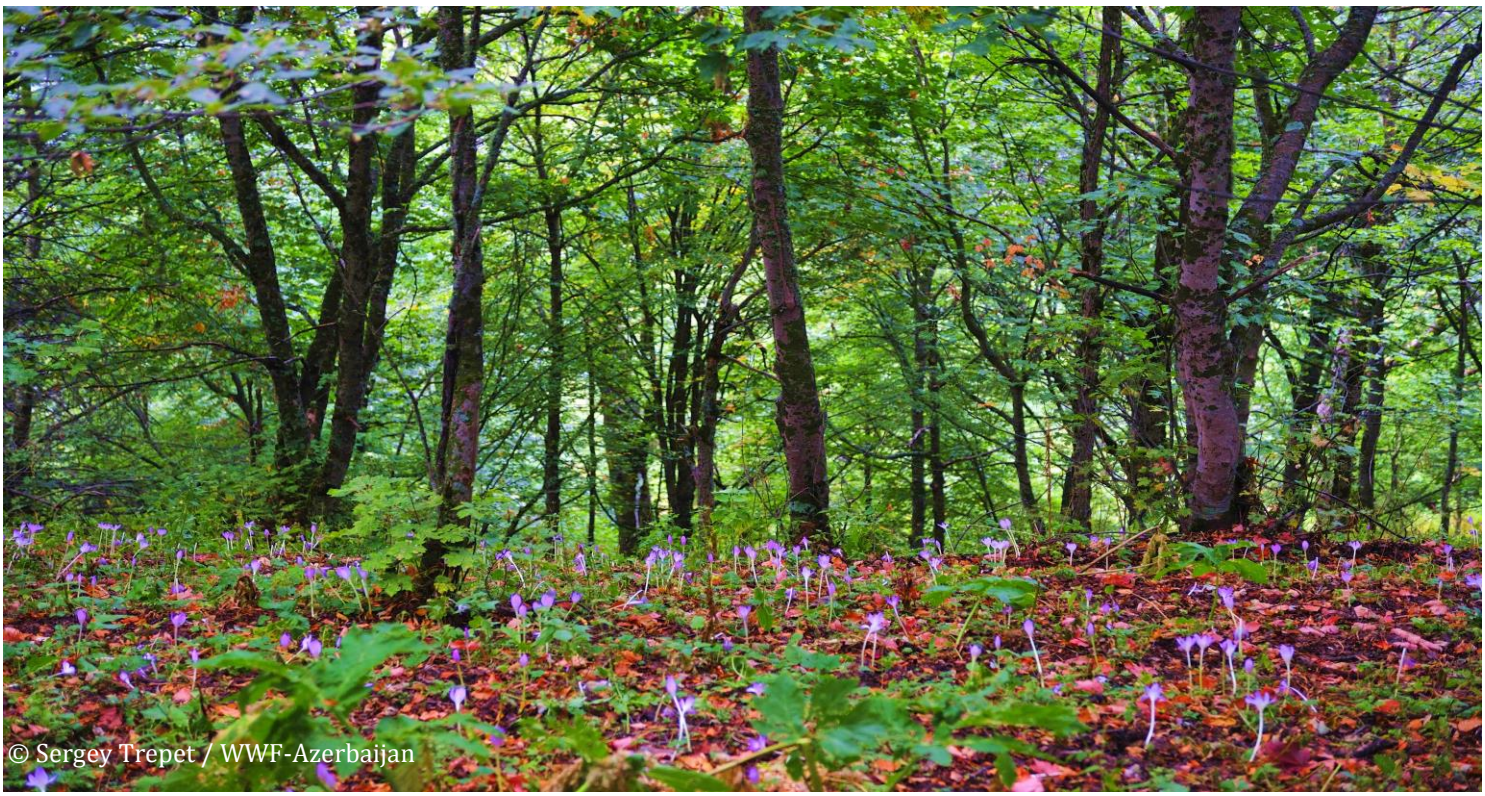

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CONTENTS

List of figures

List of tables

Acronyms

AZR	Azerbaijan Republic
BAU	Business As Usual
DBPNA	Department of Biodiversity and Protected Natural Areas
ESS	Ecosystem Services
FDD	Forestry Development Department
FLEG	Forest Law Enforcement and Governance program
MCT	Ministry of Culture and Tourism
MENR	Ministry of Ecology and Natural Resources
NFP	National Forestry Program
SEM	Sustainable Ecosystem Management
SFCS	State Fire Control Service
SLMC	State Land and Mapping Committee
TEEB	The Economics of Ecosystems and Biodiversity
UNDP	United Nations Development Program
UNEP	United Nations Environmental Program

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Executive Summary

The aim of the FLEG II Program is to promote sustainable forest governance, management, and protection of forests in the participating countries, including Azerbaijan. The program supports forest governance through enhancing forest policy, legislation and institutional arrangements, and implementing sustainable forest management models on a pilot basis. This TEEB scoping study, as a part of the FLEG II program, makes a preliminary analysis of the ecosystem services provided by forested areas in Azerbaijan.

Azerbaijanis consider forests to be one of the most valuable natural resources in their country. It is estimated that the total area of forests and scrublands in Azerbaijan is more than 860,000 ha, most of which are located in mountain areas. Riparian and plain forests in Azerbaijan only occupy areas, where the groundwater table is rather close to the surface that may permanently supply trees with water.

Forests in Azerbaijan provide a broad range of ecosystem services. In most of the rural areas, fuelwood is a major source of energy. Also, forested watersheds are the only source of drinking water for all of the population in Azerbaijan that live in mountain regions. In addition, forested mountain areas are the preferred recreational areas for tourists in Azerbaijan.

In order to analyze the ecosystem services of forests, "Business as Usual" (BAU) and "Sustainable Ecosystem Management" (SEM) analytical approaches have been used. Under BAU management, non-sustained use of natural resources is understood, that gives only short-term gains. In this type of management, some stakeholders may maximize their benefits for short-term periods, causing substantial damages to ecosystems and, in this way, negatively affecting financial and social conditions of other stakeholders. Under the SEM management, economic benefits are maximized through planned and integrated use of natural resources. While economic benefits of some stakeholders under the SEM may be minimized for short-term periods, over the long-term periods, economic gains for all types of stakeholders are increased and sustained. Evaluation of the current state of the forestry sector and its policy context enables us to understand existing challenges and perspectives (TEEB foundations, 2010).

The traditional BAU practices in Azerbaijan include illegal logging, unsustainable tourism, overgrazing and other activities. In addition, the impacts of climate changes are considered as a BAU practice, since it has mostly been recognized as the human induced phenomena. SEM is taken as an alternative policy to the BAU. All-inclusive analyses of alternative policies (BAU vs. SEM), including their impacts on biodiversity and ecosystem services is given. These analyses describe advantages of SEM practices over the long-term periods.

This study also identifies key elements for a full TEEB study, including a roadmap of activities, and a list of important outputs to be delivered in such a study.

Introduction

The EU funded *"European Neighborhood and Partnership Instrument East Countries Forest Law Enforcement and Governance II Program"* (FLEG II) is aimed to support the participating countries strengthen forest governance through enhancing their forest policy, legislation and institutional arrangements. The implementation of sustainable forest management models on a pilot basis is also envisaged. The Program is implemented in seven countries: Armenia, Azerbaijan, Belarus, Georgia, Moldova, Ukraine, and the Russian Federation.

It builds on initiatives undertaken under the first phase of the EU funded FLEG Program and will be carried out over a four-year period, with end disbursement date of June 30, 2017. Implementation of the Program is led by the WB, working in partnership with the International Union for Conservation of Nature (IUCN) and the World Wide Fund for Nature (WWF).

Main Program activities implemented by WWF in Azerbaijan involve the evaluation of forest biodiversity and ecosystem functions (TEEB - scoping study level), exploration of the forest certification potential, promoting sustainable forest management planning and awareness raising of the stakeholders about the importance of sustainable forest management.

TEEB is one of the very important components of the FLEG II Program. In 2007, the TEEB was initiated by the German Government and European Commission. It is financially supported by the UNEP. As an international initiative, the TEEB promotes sustainable economies in which the values of biodiversity and ecosystem services are fully reflected in decision-making. The aim of the TEEB studies is to assess the economic value of ecosystem services. It identifies the most important ecosystem services and makes recommendations for new policies in a given sector.

In 2013, as a joint effort of the Government of Georgia, UNEP and WWF-Caucasus Programme Office, the document "TEEB Scoping Study for Georgia: Main Findings and Way Forward" was produced. The study assessed five sectors of the Georgian economy – energy, tourism, agriculture, mining and forestry, demonstrating that these sectors largely depend on natural ecosystems. The need for a full-scale TEEB study was also identified.

In the framework of the FLEG II Program, similar scoping study is conducted in Azerbaijan with particular focus on the forestry sector. This should lay a foundation for the subsequent full-fledged TEEB study for the forestry sector of the country, clearly demonstrating the advantages of sustainable forest management.

Objectives, scope and methodology of the study

This study aims to outline thematic and policy questions about the forestry sector in Azerbaijan that should be answered by a full TEEB. It will provide an implementation roadmap for undertaking that full TEEB study in the future. The objectives of the scoping study are:

- Understanding the policy context within which forest sector operates in Azerbaijan
- Understanding the degrees of impact of the forestry sector on natural ecosystems and the

dependence of the former on the latter
- Identification of alternative policy scenarios and their potential impacts on natural ecosystems
- Identification of the key thematic and policy areas and key questions on which the full TEEB study would focus
- A roadmap for and a list of outputs which would be delivered by the full TEEB study.

The scope of the study includes:
- Brief evaluation of the current state of the forestry sector, existing challenges and perspectives, and relevant policy context
- Assessment of governance – key stakeholders influencing the formulation and adoption of policies
- Analysis of the sector's impacts and dependencies on biodiversity and ecosystem services
- Description of alternative policies (i.e. Business As Usual versus Sustainable Ecosystem Management), including their impacts on biodiversity and ecosystem services
- Outlining the questions to be addressed by the full TEEB country study for the forestry sector, including a roadmap for such a study.
- The interdependence of the forestry and other relevant sectors (e.g. tourism, agriculture) is also assessed.

In order to analyze ecosystem services of forests, "Business as Usual" (BAU) and "Sustainable Ecosystem Management" (SEM) analytical approaches have been used. This approach has been firstly used by UNDP study to evaluate ecosystem services in Latin America and Caribbean (Bovarnik et al, 2010). Under BAU management, non-sustained use of natural resources is understood that gives only short-term gains. In this type of management, some stakeholders may maximize their benefits for short-term periods, causing financial and social damages to ecosystems, other stakeholders and themselves for long-term period. Under the SEM management, economic benefits are maximized through planned and integrated use of natural resources. While economic benefits of some stakeholders under SEM may be minimized for short-term periods, over the long-term periods, economic gains for all types of stakeholders are increased and sustained. SEM practices tend to support ecosystem sustainability as a practical and cost-effective way to realize long-run profits (Bovarnick et al, 2010).

Sector governance and problems

The Ministry of Ecology and Natural Resources of Azerbaijan (MENR) conducts Forest management in accordance with the Forest Code and the Law on Environmental Protection. The ministry is also a main policy making institution with respect to environmental issues. The Forestry Development Department (FDD) under the MENR is the main government agency responsible for management of the protected areas.

The State Land and Mapping Committee (SLMC) is the central executive body implementing land cadaster and monitoring. SLMC within its authority may monitor forested areas. State Fire Control Service (SFCS) of the Ministry of Emergency situations is an executive authority for fire combating activities. The establishment of fire prevention rules, reduction of fire risks, taking actions directed to fire prevention are implemented by the Fire Control Service.
Ministry of Culture and Tourism (MCT) is a main executive body implementing tourism policy. MCT conducts tourism management in accordance with the relevant legislation on tourism.

However, significant gaps exist in cooperation among the above-mentioned institutions; e.g. there is no effective cooperation between FDD and the DBPNA. Also, since the FDD and SFCS belong to different ministries, close cooperation between these institutions is often challenging. This kind of management creates obstacles for sustained governance of forests, and coordination among the aforementioned institutions are rather weak.

There is insufficient coordination between MENR and MCT. MENR is a government body that manages national parks and other categories of protected areas, while MCT is a body that implements tourism policy. Currently, MCT is not involved in management of national parks and has no direct power to improve tourism potential of the parks. This obstacle creates additional problems for effective management of national parks. For instance, the national parks with forested areas are not always open to tourists. Recreational activities in the area of parks are not organized well. The infrastructure and recreational design of the parks is rather weak and in most cases not user friendly. Design of national parks in the country is not influenced by the intended purpose and audience, as well as by the available land features.

Local communities and municipalities are not involved in the management of forests. The former depend on forests for fuel to heat homes in cold weather. The present legislation creates conflicts between FDD, DBPNA and local communities.

Research on forestry issues in Azerbaijan is practically not carried out. The Forestry Research Institute of MENR needs resources, including qualified staff, to conduct such research. In order to improve forestry education in Azerbaijan, Forestry School under the Ganja State University was created in 1995. However, this educational program does not have qualified staff and other resources required to meet basic standards of quality education about forestry.

Relevant policy context

All forests of the country are publicly owned and managed by the state in accordance with the provisions of the Forest Code and the Law on Environmental Protection.

The current Forest Code, adopted in 1997, provides legal grounds for tending, protecting, restoring, and using the Azerbaijani forests and related resources. This code identifies the forest resources of Azerbaijan as a shared national wealth. The Forest Code constitutes the basis of the forest legislation and regulates the balance between the use and protection of forest resources. All the forests constitute the forest fund of the country. There is no opportunity for representatives of the private sector or local communities to participate in management of forests.

Law on Environmental Protection (adopted in 1990) establishes the legal, economic and social grounds for the protection of environment. One of the key goals of the law is to ensure an efficient use of natural resources (including forests).

- Article 3 of the law establishes the main principles including the efficient use and restoration of natural resources.
- Articles 4, 5, 6 and 7 establish the rights and responsibilities of the state, local self-governing bodies, citizens and public unions in the field of environmental protection.
- Article 10 envisages a relevant body with executive power to determine maximum limits on the use of natural resources, the deployment of harmful substances, the discharge of household and production of waste.
- According to the Regulation on the MENR, this Ministry is determined as the relevant executive body.

The current system provides little or no incentive for stakeholders to conserve forest resources and manage them sustainably. The Forest Code reduces options for public participation and private business in the forest management. More or less, the code tries to balance economic, social and environmental factors to ensure sustainable forestry. However, local forestry departments do not strictly follow the requirements of the code.

Most of the forested areas of Azerbaijan are located in protected areas, management of which is regulated by the Law on Specially Protected Areas. Articles 17 and 21 clearly distinguish state nature reserves and national parks. According to article 17, use of lands of state nature reserves, as well as of water, flora and fauna located within boundaries of such reserves for the purpose of economic activities is prohibited. Simultaneously, article 21 enables to use national parks for tourism and recreation.

In 2013, the National Forestry Program (NFP) of Azerbaijan was prepared for the period 2015-2030. According to this program, forest area of the country will be increased though the establishment of forest plantations on suitable lands. The draft of the program enables physical and legal persons to participate in the management of forest resources. However, the NFP also shows that all forest fund land is owned by the state in Azerbaijan, and public participation in forest management is not the issue of the public debate.

Forests in Azerbaijan

It is estimated that the total area of forests in Azerbaijan is more than 860,000 of ha. Much of this forest area is located in Greater and Lesser Caucasus and in Talish Mountains (Mammadov and Khalilov, 2002; see also Annex 1). Mountain forests are mainly located in high and middle mountain regions and occupy about 10% of the total land area of Azerbaijan.

The mountain forests consist of a broad range of tree species. Oriental beech *(Fagus orientalis)*, Georgian oak *(Quercus iberica)*, Chestnut oak *(Quercus castaneifolia)* and hornbeam *(Carpinus betulus)* are the main trees that comprise mountain forests of the country (Akhundzade and Huseynov, 1963).

Beech forests in Azerbaijan are spread in all of the mountainous regions, where the climate is relatively humid. These forests are often mixed with other tree species. Due to the intense deforestation and overgrazing, most of beech forested areas experience degradation. Georgian oak trees occupy middle and low attitudes of the Greater and Lesser Caucasus Mountains. The highest elevation in Azerbaijan, where Georgian oak grows, is 1,000-1,400 m, where relatively dry climate is observed. Chestnut oaks are located in plain and mountain areas of the Lenkoran region. In lower belts of the Talish mountains, chestnut oaks are often mixed with ironwood *(Parrotia persica)*, azat tree and silk acacia *(Albizia julibrissin)*. Hornbeam forests occupy all the mountain elevations, since they are relatively resilience to climatic variations in Azerbaijan. Therefore, hornbeam trees in Azerbaijan may occur at elevations from 200 to 1,500 meters (Salmanov, 2005).

Riparian and plain forests in Azerbaijan occupy areas, where groundwater table is rather close to the surface and may permanently supply trees with water. These areas include Lenkoran and Yalama areas and Qanıx-Haftaran valley. In addition, there are nearly 20,000 ha riparian forests in Azerbaijan, that mainly occupy banks of the Kura and Araz rivers. Riparian forests of Azerbaijan are locally called tugay forests. The areas, where tugay forests are spread are subject to regular inundation as well. Therefore, tugays are largely dependent on floods and groundwater rather than directly from rainfall (ANAS, 2004).

Close to rivers, where soil moisture levels are rather high, the forests are usually dominated by willow and poplar species. White poplar *(Populus alba)* and black poplar *(Populus nigra)* occupy areas, where groundwater table is very close to the surface. Rapid growth is characteristic of all these tree species.

There is strong historical evidence that the tugay forests used to occupy extensive areas along the Kura and Araz rivers. Recently, most of the tugay forests in Azerbaijan consist of poplar trees. These forests occupy nearly 8,000 ha, most of which experience extreme degradation. Due to intensive deforestation,

most of tugay forests are swept out or replaced by urbanized lands. Flow regulation in the Kura river has also affected tugay forests, reducing areas of floodplains.

A significant proportion of forests and scrublands is protected relatively well, being included in national parks and nature reserves.

Hirkan National Park occupies Southeast part of Azerbaijan, Lenkoran Lowland and the Talysh Mountains including the Azerbaijani part of the Caspian Hyrcanian mixed forests. The area of the park is entirely covered by forests. The park has various types of relict and endemic plants species of Tertiary period, such as Hirkan box tree *(Buxus hyrcana),* iron tree *(Parrotia),* silk acacia *(Albizia julibrissin),* alder-tree, *(Alnus subcordata)* and Hirkan pear-tree *(Pyrus communis subsp. Caucasica).* The park also shelters several valuable animal species like leopard *(Panthera pardus saxicolor),* lynx *(Lynx lynx)* and brown bear *(Ursus arctos)*. Hirkan National Park is also famous by its rare natural monuments. There are more than one hundred natural and cultural monuments in the park's area. The site is going to be included into UNESCO's World Heritage Site list of cultural and natural heritage and Biosphere Reserves.

Shahdag National Park is located in the northern part of the country in the Greater Caucasus Mountains. It is the largest national park in Azerbaijan, the area of which is more than 130.000 ha. The forested part of the site includes Caucasian oak *(Quercus macranthera)*, Caucasian ash *(Fraxinus angustifolia subsp. oxycarpa)*, European hornbeam *(Carpinus betulus),* oriental hornbeam *(Carpinus orientalis),* oriental beech *(Fagus orientalis)* etc. The park shelters several valuable mammal animal species such as East Caucasian tur *(Capra cylindricornis),* Caucasian chamois *(Rupicapra rupicapra subsp. caucasica),* Bezoar ibex *(Capra aegagrus)* and domestic goat *(Capra aegagrus hircus)*. The area of the park includes many social and cultural attractions as well.

Göygöl National Park is located in the northwest part of Azerbaijan. Forests of the park include many types of valuable tree species, such as chestnut-leaved oak *(Quercus castaneifolia),* Caucasian oak *(Quercus macranthera),* Caucasian ash *(Fraxinus angustifolia subsp. oxycarpa),* European ash *(Fraxinus excelsior),* European hornbeam *(Carpinus betulus),* oriental hornbeam *(Carpinus orientalis),*oriental beech *(Fagus orientalis)* etc. The site include many famous natural lakes like Goygol and Maralgol that considerably increase economic value of the area. The fauna of the park include Caucasian red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus)*, brown bear *(Ursus arctos),* billy goat *(Capra aegagrus)*, badger *(Meles meles)*, forest cat *(Felis silvestris silvestris)* etc.

Altyaghach National Park is located in the Greater Caucasus region of Azerbaijan and very close to the central city of Baku. The area of the park is mostly covered by temperate deciduous broadleaved forests. The major types of trees are Persian ironwood *(Parrotia persica),* Caucasian oak *(Quercus macranthera),* Caucasian ash *(Fraxinus angustifolia subsp. oxycarpa),* European hornbeam *(Carpinus betulus),* oriental hornbeam *(Carpinus orientalis),* oriental beech *(Fagus orientalis),* silver birch, etc. The park is home to East Caucasian tur *(Capra cylindricornis),* lynx *(Lynx lynx),* brown bear *(Ursus arctos),* wild boar *(Sus scrofa),* etc. Closest to the most populated areas of Azerbaijan makes the park very attractive to the residents of the Central Baku area.

Qarayazi State Reserve is the only protected area that includes riparian forests along the Kura river. The forested area includes willow and poplar species. White poplar *(Populus alba)* and black poplar *(Populus nigra)*, oak, alder-tree and white acacia are the main tree species in the area. Fauna of the area include wild boar and deer, pheasant, thrush, dove, etc. The reserve was established in 1978, however, over a long period, the protection of forests and animals species was not well organized.

Basut-Chay State Reserve is located in Southeast of Azerbaijan. The area of the park is completely covered by oriental plane trees *(Platanus orientalis)*. The oriental planes can be found in riverine areas, together with such trees as alder, willow and poplar. However, planes are rather resilient to long dry

period and can survive long periods of droughts. Recently, the area of reserve is under military control due to conflict with Armenia and not accessible.

The Eldar Pine State Reserve area is about 17 km². The site is located in the Samukh Administrative District, North-West of Azerbaijan. The reserve is established to preserve and protect valuable endemic Eldar pine *(Pinus eldarica)* species.

Ecosystem services provided by forests of Azerbaijan

Forests cover a notable part of the world (about one third of the total land area), except those areas that are mainly rainless or have lower temperatures year-round. In Azerbaijan, forests cover 11% of the total area, and exist mainly in mountain regions of the country.

Many essential goods can be derived from natural ecosystems (Daily et al., 1997). The ecosystems are the only providers of natural resources, which are very important to human wellbeing and survival (Costanza et al., 1997; Pearce and Atkinson, 1993; Flores and Adeishvili, 2011).

Forests provide a broad palette of ecosystem services. They effectively regulate climate, purify water (Ayilward et al.,2010) and reduce flood and drought risks in mountain areas (Douglas, 2001). Forests also provide a reliable shelter for many living organisms and are essential for biodiversity protection. Recreation, soil protection and cultural peculiarities are among the most important ecosystem services provided by forests (Costanza et al., 2007).

The Millennium Ecosystem Assessment (2005) classifies ecosystem services as provisioning, regulating, cultural and supporting (Table 1).

Provisioning services linked to forests refer to the human use of forest products. Forests provide wooden construction materials, fuel, food, mushrooms and animals. Trees may provide raw materials for silk production. Many medicines, biocides, spices are derived from forests.

Recently, in most of the rural areas of Azerbaijan fuel wood is a major source of energy. Wood is used to bake bread, prepare meals and heat houses during the winter. During the Soviet period, most of the villages in Azerbaijan used coal from the Ukraine, the price of which was relatively cheap. Several studies confirm that average household wood use is nearly 12-15 m^3 (Noack and Hidayatov, 2007).

Livestock rearing is very important for all forested regions of the country. Livestock and dairy products are important farm products produced in the country. Villagers in most regions of Azerbaijan confirm that livestock production contributes an average of 30-40 percent of the total income. During the summer, most of Azerbaijan forests are used as the primary grazing areas. Cattle, sheep, water buffalo, goats, horses are the most important domestic animals in Azerbaijan.

Forests have a vital role in maintaining ***regulatory ecosystem services***. Forest vegetation makes soil more porous so that forest soils may store large amounts of water. It is recognized that forests increase infiltration and interception, storing a considerably larger proportion of incoming precipitation in the basin. In other words, forests are the natural regulators of stream flow and considerably reduce flow peaks that may result in flash floods.

Table 1: Ecosystem services provided by forests (Millennium Assessment)

Provisioning Services	*Regulatory Services*	*Cultural Services*	*Supporting Services*
Construction materials	*Maintenance of water quality (natural filtration and water treatment)*	*Recreation and tourism*	*Role in nutrient cycling (role in maintenance of floodplain fertility), primary production*
Plants and animals for food and medicines	*Buffering of floods erosion control through water and land interactions and flood control infrastructure*	*Existence values*	*Predator/prey relationships and ecosystem resilience*
Non-timber forest products (mushrooms, plants)	*Natural regulation of stream flows*	*Option values*	
	Prevention of droughts		

Almost in all forested regions of Azerbaijan, forests are the major sources of water that is naturally purified and filtered. It is very important to note that almost all the forested regions of the country have no water treatment plants and human populations directly use natural water supplies from the forests. This circumstance enables the provision of low-cost sources of water supply. These costs would otherwise include all the aspects of water supply, including the construction of water treatment facilities and related operational and maintenance costs. Rough estimations confirm that nearly 2,100,000 people in Azerbaijan use non-treated clean water that is supplied from forested watersheds.

Forests filter sediments from water, thereby considerably reducing power generation costs by increasing effectiveness of work of the hydropower dams. It is believed that correct watershed management can avoid expenses related to the water treatment. Sediment filtering also contributes to improving fish habitats (Costanza et. Al., 1997).

Erosion and mudflow prevention is one of the most important peculiarities of forests in Azerbaijan. Slopes in mountain regions of Azerbaijan are very steep that make areas very vulnerable to erosion. Studies confirm that erosion rates and mudflow frequencies in forested areas are notably lower than in non-forested regions. For instance, in Nakhichevan region of Azerbaijan, where forests do not exist, the turbidity of streams is much higher than in forested regions.

Trees also contribute to cooler air and warmer winter temperatures reducing difference between winter and summer temperatures and making areas more attractive with respect to tourism and agriculture. This effect may considerably reduce energy expenses for heating during winter and cooling during summer times. In Nakhichevan region of Azerbaijan, where forests do not exist, annual temperature amplitude is nearly 35-40 ^{0}C. Cold and longer winters increase heating and cooling expenses in this region.

Forests also contribute to improved quality of air. The studies confirm that trees have a very important role in regulating air temperature, removing airborne pollutants and carbon dioxide.

During photosynthesis, forests remove carbon from the atmosphere and return oxygen back into the atmosphere. Therefore, trees can be recognized as carbon sinks since they play a key role in removing carbons. According to the Second National Communication of Azerbaijan to the United Nations Framework Convention on Climate Change (2010), the volume of carbon removal by woodlands was more than 3,800 Gt in 2005. This amount makes 7% of the country's total CO2 emissions (SNC, 2010).

Cultural services are one of the most important services provided by forests in Azerbaijan. Generally, forests have very important functions that support tourism and recreation. By providing recreational opportunities, forests encourage people to live healthy, active lifestyles. Hiking in mountain areas, hunting and gathering forest foods are the most important peculiarities that forested areas provide.

Cultural services are becoming increasingly important in Azerbaijan as incomes and leisure time off increase for people. These opportunities are non-material benefits that people may obtain from the forests. According to the Statistical Committee of Azerbaijan, the number of tourists visiting forested sites is notably higher than the areas with no forests (www.stat.gov.az)

Biodiversity of forests may provide certain valuable species. People started to assign more importance to existence of valuable forest species. For example, leopards have returned to Hyrcan National Park of Azerbaijan were previous estimates found none in existence. Leopards and other species add value to the forest as a wild habitat and as place for related tourism. Existence value is a willingness to pay for only the existence of environmental resources. For example, donation of people for protection of local leopards can be considered as the existence value of these species.

Supporting services of forested areas include forest roles in nutrient cycling, predator-prey relationships and ecosystem resilience. Forests of Azerbaijan shelter valuable animal and bird species. East Caucasian tur *(Capra cylindricornis)*, Caucasian chamois *(Rupicapra rupicapra subsp. caucasica)*, Bezoar ibex *(Capra aegagrus aegagrus)*, lynx *(Lynx lynx)*, brown bear *(Ursus arctos)*, wild boar *(Sus scrofa)*, golden jackal *(Canis aureus)*, Leopard are the most valuable species that are being sheltered by woodlands of Azerbaijan.

BAU practices in a forestry sector of Azerbaijan

Deforestation and overgrazing: Deforestation is considered to be one of the factors that seriously threaten the ecosystems of rivers and streams in Azerbaijan. The mass removal of forests makes slopes more vulnerable to erosion and increase turbidity in water, adversely changing water quality. Increased turbidity considerably reduces water quality in freshwater ecosystems thereby adversely changing healthy environment. Increasing the capacity of total suspended solids along the rivers supports their intensive accumulation in the mouth area. Sediment accumulation in the riverbed over a long period of time may lead to the reduction of channel capacities and reduce quality of life in the ecosystem.

Intensive deforestation increases turbidity of water in rivers and streams. Since suspended solids absorb more heat, water temperatures in high turbid waters are usually high, which in turn reduce concentration of dissolved oxygen. Higher turbidity also seriously reduces the amount of light penetrating the water that negatively affect photosynthesis and the production of dissolved oxygen. Also, suspended substances can plug fish gills, reducing resistance to disease in fish, lowering growth rates, and affecting egg and larval development.

Deforestation in Azerbaijan may have many reasons. Most of these reasons are directly linked to agricultural activities. Forests are cut down for clearing areas to plant crops. Road development may also cause considerable deforestation. Roads in forests increase opportunities for further infrastructure development.

Illegal logging is one of the main income sources for local population. Studies have found out that there are direct relationships between illegal logging and poverty (e.g. Noack and Hidayatov, 2007). Recently, the volume of illegal logging have significantly dropped. However, it still remains at high levels. The high profitability and lack of alternative income sources make illegal logging very attractive for local residents.

Overgrazing is one of the main drivers of deforestation. If forested areas are exposed to intensive grazing, young trees will not be able to grow and replace old trees. In other words, forest recovery processes will be less intensive or completely stopped. This pattern will reduce density and productivity of forests gradually increasing the vulnerability of the land. Overgrazing usually occurs in poorly managed agricultural applications, where livestock populations exceed maximum rates.

It is widely recognized that the mass removal of vegetation decreases infiltration and evapotranspiration. This makes steep slopes much more susceptible to sheet erosion. There are evidences that increased frequency of landslides in Azerbaijan is directly associated with logging.

Deforestation and the mass removal of vegetation in the Kura basin increased the rate of denudation, which subsequently affected rates of sheet and rill erosion via surface runoff. Consequently, this increases the speed and intensity of soil erosion in the catchment areas of small rivers belonging to the Kura basin (Abbasov and Kondratyev, 2006).

Climate change: The diversity and distribution of forests in the Greater Caucasus, depends on climate, land, elevation and other factors. The recent observations show that oak trees in low altitudes are drying out, which can be associated with both decrease of groundwater resources and rise in temperature. Naturally, this factor increases the flood risks in medium and low mountain areas. Simultaneously, oak forests have moved upwards on altitudinal zones gradually replacing beech and hornbeam trees in many places. Same tendency can be observed not only in natural mountain trees, but also in the vertical distribution of agricultural plants grown (SNC, 2010). These developments prove the impact of climate changes to the distribution of plants in the area, which signals serious problems in the mountain communities in the future and necessitates immediate adaptation measures.

Pathological changes occurring in the forests reduce the soil layer's durability against erosion. The drying of the roots of trees reduces the stickiness of soil. As a result, dried and physically eroded land becomes weaker against washout. The strong washout of soil layer causes collapse of forest soils and mudflows.

Unsustainable tourism: Due to increasing interest on nature-based tourism, pressure on forested regions of the country also increases. The problem is aggravated by low educational level of the tourists and people involved in tourism business.
According to official statistics, the number of tourists coming to Azerbaijan has considerably increased over the last seven years. In 2006, the number of served foreign tourists was 218,982 person-days, while in 2012 this rate has reached 674,435. Investments in the tourism sector mainly include government expenditures that involve large-scale constructions.

SEM as an alternative policy option

Under the BAU approach landowners and companies maximize their financial benefits over the short-term periods. In contrast, under the SEM, natural resources are used to increase benefits for all stakeholders and involve not only physical capital, but also effective ecosystem management (TEEB Georgia, 2013; Aylward et. al., 2010). Recently, forestry management in Azerbaijan applies the BAU approach that gives rather high financial benefits to several stakeholders. For example, illegal logging may result in high incomes, simultaneously reducing the recreational service quality and making tourist areas less attractive. Also, it reduces habitat and game quality, creating conflicts between predators and livestock, increasing the levels of soil erosion and reducing the area of pastures (TEEB Georgia, 2013).

The SEM approach ensures stable and sustained gains for all types of stakeholder, increasing quality of ecosystem services. While economic benefits of some stakeholders under the SEM may be minimized for short-term periods, over the long-term periods, economic gains for all types of stakeholders are increasing and remain sustained (TEEB Georgia, 2013). Under the SEM management, economic benefits

are maximized through planned and integrated use of natural resources. The SEM approach in the forestry sector uses only principles of sustainable development and has long-term social, economic and environmental goals.

There is a broad range of international documents that support sustainable forest management. Policy priorities, principles and criteria for sustainable forest management have been outlined in a number of international agreements and processes (TEEB Georgia, 2013). The Earth Summit Forest Principles (1992) recognize forests as essential to economic development and the maintenance of all forms of life.

Development Concept: "Azerbaijan-2020: outlook for the future" and "National Program on Sustainable Socio-Economic development" stipulate that socio-economic development must be environmentally sustainable. According to the development concept, further measures will be taken to preserve biodiversity, restore green areas and effectively protect the available resources. These documents consider that the establishment and restoration of forest ecosystems should coincide with any development actions. Forest Code of Azerbaijani Republic and NFP also support sustainable management of forests.

Table 2 illustrates how the environment and ecosystem services are affected as a result of BAU approach and how shifting to SEM may change service quality in the long-term.

Following from the table above, shifting from BAU to SEM will reduce the impacts that cause deforestation and ensure long-term win-win strategies for future ecosystem management. Such shifting may positively affect the following:

- ✓ **Employment in the forestry sector** - this includes mainly people involved in tourism and local forest departments. Local people involved in service of tourists and working in local enterprises have also been included here. The SEM ensures long-term stability in this field.
- ✓ **Recreational value** of forests depends on the quality of recreational services and number of tourists. The SEM guarantees stability and sustainable tourist activities.
- ✓ **Avoided costs** include the costs which did not occur because of the retaining of forest cover. For example, forests naturally purify water and expenses related to the existence of water treatment stations and waterborne diseases can be looked as the avoided costs. Also, avoided costs include costs of airborne diseases since forests effectively purify air. Since the SEM guarantees long-term stability of these services, these avoided costs remain forever.
- ✓ **Costs related to carbon reduction** - as it has been noted, forests are very effective carbon sinks. Costs related to carbon removal are also looked at as avoided costs.
- ✓ **Property prices** - it is believed that the prices of property close to the forested areas are considerably higher than the prices in non-forested regions. The SEM guarantees gradual increase in property values for land and houses, since the value of these properties is strongly dependent on the quality of services provided by forests.

Table 2: Summary of potential ecosystem service change for the forestry sector of Azerbaijan (adopted from TEEB Georgia, 2013)

Main service types		Impact on ESS		Description
		BAU	**SEM**	
Provisioning	**Food**	↓	↑	**BAU↓:** (i) Deforestation reduces habitat and game quality (ii) More predator-livestock conflicts (iii) Deforestation decreases the area of pastures due to soil erosion **SEM↑:** (i) Sustainable forest management increases capacity for game (ii) Less predator-livestock conflicts due to existence of prays
	Water	↓	↑	**BAU↓:** (i) Deforestation reduces natural water regulation (ii) Less water available for irrigation and household water supply (iii) Longer droughts (iv) Deforestation reduces purifying and filtering ability of forests **SEM↑:** (i) More water available for irrigation and household water supply (ii) Lesser dry periods during summer times (iii) Higher water quality
	Raw materials	↓	↑	**BAU↓:** (i) Increased timber and fuel wood production in the short term (iii) Decreased timber production in the long-term **SEM↑:** (i) Sustainable management implies less deforestation, resources harvested sustainably
	Genetic resources	↓	↑	**BAU↓:** Unsustainable forest management reduces genetic resources **SEM↑:** Sustainable forest management increases genetic resources
Regulatory	**Carbon sink**	↓	↑	**BAU↓:** (i) Deforestation reduces ability of forests to sink carbon **SEM↑:** (i) Sustainable forest management increases capacity of forests to sink more carbon
	Watershed management	↓	↑	**BAU↓:** (i) Deforestation increases frequency of floods, debris flows, erosion and landslides **SEM↑:** (i) Sustainable forest management reduces frequency of floods, debris flows, erosion and landslides
	Water purification	↓	↑	**BAU↓:** (i) Deforestation increases sediment concentration in water sources reducing quality of water (ii) Deforestation reduces ability of forests to purify water naturally **SEM↑:** (iii) Sustainable forest management increases capacity of forests to purify waters naturally
	Climate regulation	↓	↑	**BAU↓:** (i) Deforestation increases summer temperatures and decreases winter temperatures, making less comfort for people **SEM↑:** (ii) Sustainable forest management increases capacity of forests to regulate climate more effectively
Cul-tural	**Tourism**	↓	↑	**BAU↓:** (i) Unsustainable tourism increases gains only for short term periods, reducing all types of service values **SEM↑:** (i) Sustainable forest management reduces gains for short term periods, ensuring sustained gains for long-term period
Sup-porting	**Agriculture and ecosystem protection**	↓	↑	**BAU↓:** (i) Deforestation reduces role in maintenance of floodplain fertility (ii) Deforestation affects predator-prey relations, reducing shelters of species **SEM↑:** (i) Sustainable forest management increases capacity of forests in terms of floodplain fertility (ii) Sustainable forest management increases capacity of forests in terms of predator-prey relationships.

A roadmap for the full TEEB study

This scoping study is a preliminary step and provides a roadmap for the full TEEB study focused on the forestry sector. The latter will fully assess the ecosystem service values of forests. The full TEEB study will develop a comprehensive analysis of use and non-use values in Azerbaijan, with a vision of what sustainable forest management means. It will aim to assist the government of Azerbaijan in the formulation of sustainable forest management strategy, by addressing several important forest policy issues.

In order to assess the services provided by forests, it is very important to collect following data and information:

- Exact area of forests in Azerbaijan
- Recreational activities in forested regions, including number of tourists, their expenditures
- Planned touristic activities in forested regions
- Rates of timber production and use, illegal and legal logging
- Production volumes of non-timber forest products: wild fruit, berry, mushroom etc.
- Cattle-breeding in the target regions
- Agricultural and domestic water use.

The full TEEB study on the forestry sector would assess the following ecosystem services:

Provisioning Services: Construction materials, wood, non-timber forest products. Direct available information regarding aforementioned values will be used. If no direct information will be available, indirect methods could be used to estimate values of these services.

Regulatory services include natural water supply and treatment. Due to these types of ecosystem services, the costs related to water management are avoided. As noted, if the water is naturally clean, the costs related to water treatment will be avoided. The regulatory value of forests may be assessed using a cost avoidance method.

Cost avoidance method estimates the cost of replacing environmental assets or the cost of providing substitute services if the regulatory services of forests were lost or diminished. In particular, three different cost avoidance methods can be distinguished: the Damage Avoidance Method, the Replacement Cost Method and the Substitute Cost Method (Ecosystem Evaluation, 2014). Under the Damage Avoidance Method, estimates are sought of costs avoided by preserving the forests as a natural resource. This implies estimation of potential damages, and then calculation of either corresponding costs or cost avoidance. For example, preservation of natural watersheds (including forests) in the forested regions of Azerbaijan, avoids the construction of water treatment plants, so this implies that the forests in Azerbaijan worth to the capital and operation costs of the treatment plants (Scandizzo and Abbasov, 2012). Other example is erosion in deforested areas. Erosion protection functions of forests may be estimated as the damages avoided if the erosion does not occur or by the expenditures property owners make to protect their property from erosion. In this case, the erosion protection services of a forest might be replaced by terracing.

Cultural services: Assessment of cultural services will require a broad range of activities. The available methods to assess cultural services include a need for detailed surveys. Travel cost method (TCM) is used to estimate economic use values of environmental goods and services that are used for recreation. However, it is often difficult to estimate recreational value of forest resources because generally no prices exist for them to estimate demand functions. The main idea of the TCM is that the travel expenses represent the "price" of access to the site. Thus, numbers of trips enable to estimate peoples' willingness to pay since these trips may have different travel costs. These variations in travel costs and number of trips allow constructing demand function to reflect relationships between travel costs and number of visits that

can be used to estimate value of the site. A direct expenditure method can also be used to estimate recreational value of the forested areas. However, in this case detailed information regarding the expenses of tourists would be needed.

Cultural services include existence and option values as well. As already noted, existence of various types of animals increases the value of forests. Existence and option values can be assessed through estimating willingness to pay of certain resources. This would require a special survey among population living in Azerbaijan. The survey includes a questionnaire that helps asses the willingness to pay.

Forest proximity is one of the main factors that positively drive land prices. The price variations in forested and non-forested lands may be a preliminary view of this picture. However, positive impact of forest proximity on land and property prices should be assessed through detailed surveys. Hedonic Pricing Method may be one of the effective ways to estimate impacts of forest proximity on land and property prices. Hedonic price method is based on the idea that prices of goods are related to its characteristics. "Hedonic" characteristics are especially attractive to explain the demand of complex goods, such as residential housing or land; e.g. the price of the land reflects the characteristics - closest to environmental attractions, forests, rivers or lakes.

In case of forests, application of hedonic pricing method for the evaluation of forest stands can be organized by collecting data on residential property sales in the forested and non-forested regions. The difference between the prices of these two types of regions may roughly demonstrate economic value of forests. The data required include selling prices and locations of residential properties and other property characteristics that affect selling prices.

Supporting services assessments require methods that are used in assessment of provisioning and regulatory services. For instance, role of forests in predator-pray relationships can be assessed as a willingness to pay for existence value. Role in maintenance of floodplain fertility can be assessed as the substitute costs using Replacement and Substitute Cost Methods (Ecosystem Evaluation, 2014).

Forests of Azerbaijan shelter valuable animal and bird species. Due to these types of ecosystem services, the costs related to water management are avoided. As noted, if the water is naturally clean, the costs related to water treatment will be avoided. The regulatory value of forests may be assessed using a cost avoidance method.

Role in nutrient cycling (role in maintenance of floodplain fertility), primary production
Predator/prey relationships and ecosystem resilience
The full TEEB study would select indicators based on available data and resources. A tentative implementation plan is presented below:

Table 3. Implementation plan for the full TEEB study

Activity	Activity details	Outputs	T=0 (month)	T=1	T=2	T=3	T=4	T=6	T=8	T=10	T=12	T=15	T=18	T=20	T=24
Launch of the full TEEB study	Conduct high level launch event	Press release													
Appointment of the head expert and interviewees	Selection of the experts	Head Expert													
Data collection	Collection of electronic and hard data from possible sources	Data													
Questionnaire compiling	Making questionnaire	Questionnaire													
Interview process	Interview of tourists and local stakeholders	Interview spreadsheets													
Preparation of the first draft of the document	Writing of the text of document	First draft													
Stakeholder input	Meeting with stakeholders	Stakeholder comments													
Peer review	Review of the draft	Reviewed draft													
Final work over the report	Final work	Final version of the study													

Conclusions and recommendations

Forests of Azerbaijan have significant ecosystem services. These services may play a key role in supplying sustained sources of long-term gains, if SEM approaches will be applied. These SEM approaches may ensure not only sustained gains, but also protection of forest resources. However, many problems exist that prevent shifting from BAU to SEM in the forestry sector of Azerbaijan. These problems include both institutional and legal aspects.

Institutional problems are related to low enforcement of forests regulation by local forestry departments, forest users and timber producers. Illegal timber production, unsustainable tourism and overgrazing are the major threats to sustainable forestry. These factors notably reduce quality of ecosystem services provided by forests.

Financial problems are one of the major factors that create barriers to sustainable forestry. Allocation of financial resources is not sufficient and most of local forestry units have no adequate capacity to improve forest governance.

Current legislation has insufficient capacity to ensure public and community participation in the governance of forests. Communities located rather close to forested areas have no special rights in governance of forests. Municipalities are not involved in forest governance as well. Timber harvesting by local communities would be one of the options to be involved in forest management. Current Forest Code reduces options for public participation in the forest management. Although the code tries to balance economic, social and environmental factors to ensure sustainable forestry, local forestry departments do not strictly follow the relevant requirements due to the lack of capacity and qualified staff.

The analysis confirms that existing BAU scenario is leading to economic, social, cultural losses, making threats to future sustainable forestry. Shifting to SEM practices will require substantial changes in legal and institutional frameworks that will gradually result in increasing quality of ecosystem services and ensure long-term gains from sustainable forestry.

The full TEEB study will develop a comprehensive analysis of use and non-use values in Azerbaijan, with a vision of what sustainable forest management means. The study will also aim to provide assistance to the government of Azerbaijan in the formulation of a sustainable forest management policies and strategies.

Given the aforementioned issues related to sustainable forest management, this study recommends the following:

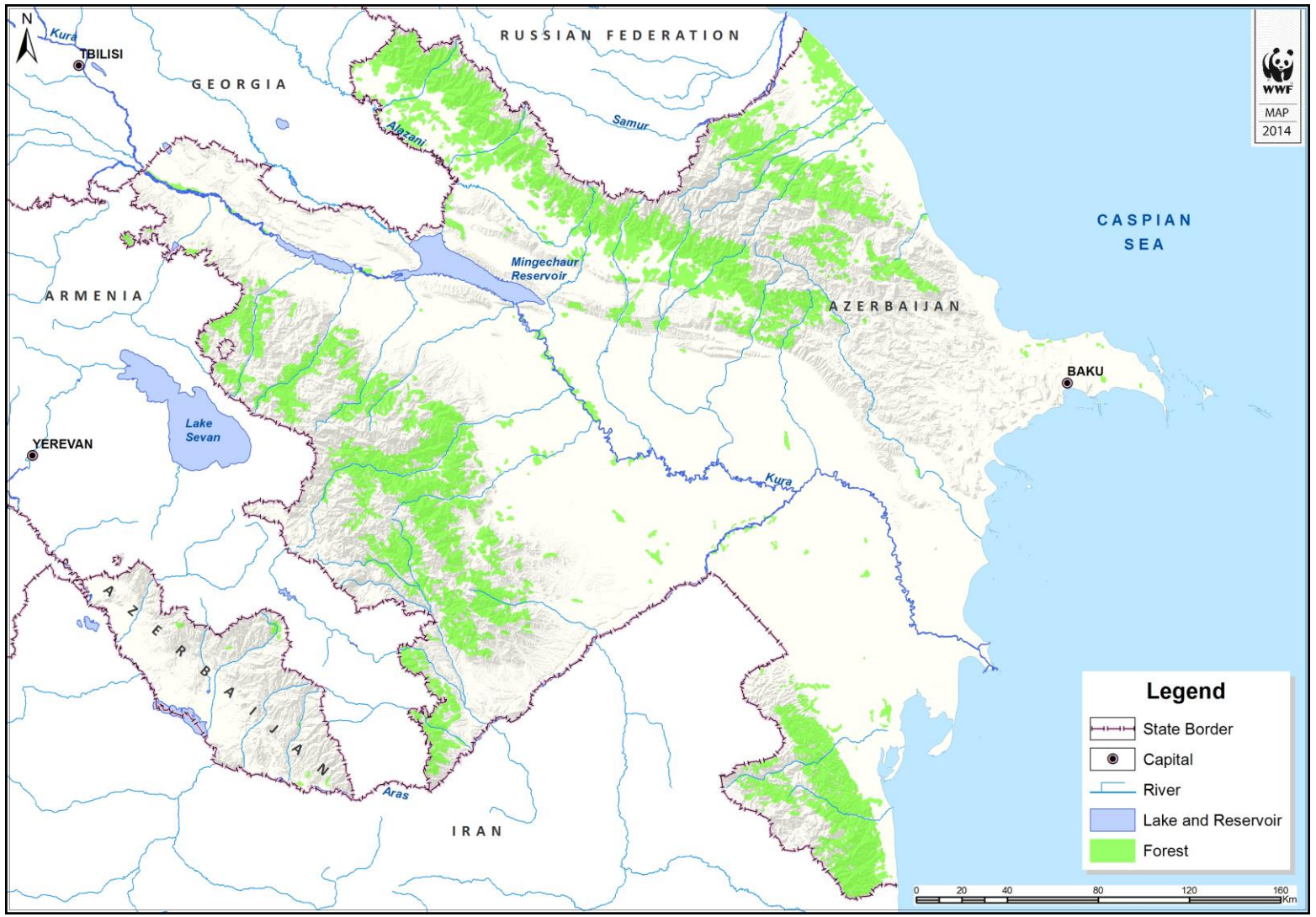
- ✓ The conducting of full TEEB study.
- ✓ The improvement of legal and institutional frameworks will significantly strengthen forest governance in Azerbaijan.
- ✓ Deep assessments of ecosystem services linked to forests. These assessments will require special surveys and methods (travel cost method, direct tourist expenditure method, cost avoidance method, etc.), which enable assessing ecosystem values correctly.
- ✓ The role of the private business in forestry management should be increased.
- ✓ The role of MCT in management of national parks should be increased.
- ✓ Private business should be involved in management of forested areas, though sustainable tourism activities.
- ✓ Design of national parks should be influenced by the intended purpose and audience, as well as by the available land features.
- ✓ Some sector governance rights should be transferred to local communities (ownership rights of some forests; hunting rights).
- ✓ Since the forests are main sources of water, ecosystem payments mechanism for upstream communities could be developed.

- ✓ Community awareness raising should be one of the most important activities in sustainable forestry.
- ✓ Increasing local job opportunities (in an environmentally sound way) would be one of the solutions to illegal logging.

References

1. Akhundzade J, Huseynov A. 1963 Forestry and nature protection in Azerbaijan. Baku (in Azeri)
2. ANAS (Azerbaijan National Academy of Sciences) 2004 Country Study on Biodiversity of the Republic of Azerbaijan: First National Report to the Convention on Biological Diversity. Azerbaijan National Academy of Sciences, Azerbaijan.
3. Aylward B., Hartwell L., Zapata O. 2010 Sustainable Ecosystem Management and Water: The Benefits of Hydrological Services. Ecosystem Economics LLC
4. Bovarnick, A., Alpizar F., Schnell C. 2010 The Importance of Biodiversity and Ecosystems in
5. Costanza, R., d'Arge, R., De Groot, R.S., Farber, S., Grasso, M., Hannon, B., Limburg, K., Naeem, S., O'Neill, R.V., Paruel, J., Raskin, R.G., Sutton, P., Van den Belt, M., 1997. The value of the world's ecosystem service and natural capital. Nature 387, 253–260.
6. Costanza, R., Norgaard, R., Daly, H., Goodland, R., & Cumberland, J. 2007 An Introduction to Ecological Economics (e-book). Retrieved from http://www.eoearth.org/view/article/150045
7. Daily, G. (ed.) 1997 Nature's Services: Societal Dependence on Natural Ecosystems. Island, Washington D.
8. Douglas K. 2001 The economic value of forest ecosystem services' A review. The wilderness society Economic Growth and Equity in Latin America and the Caribbean: An economic valuation of ecosystems, United Nations Development Programme, 2010
9. EE Ecosystem Evaluation http://www.ecosystemvaluation.org Last accessed: October 15, 2014
10. Flores,M., Adeishvili, M. 2011 Valuation of the Contribution of Borjomi-Kharagauli and Mtirala National Parks Ecosystem Services to Economic Growth and Human Well-being. Prepared for WWF Caucasus.
11. Groot R., Wilson M., Boumans R. 2002 A Typology for the classification, description and valuation of ecosystem functions, goods and services Ecological Economics 41: 393-408
12. MA (Millennium Ecosystem Assessment). 2005. Ecosystems and Human Well-Being: Synthesis. Island Press, Washington DC.
13. Mammadov Q. Khalilov M 2002 Forests in Azerbaijan Baku (in Azeri)
14. Noack F. and Hidayatov A. 2007 The Economics of Forest Depletion in Southern Azerbaijan Archiv für Naturschutz und Landschaftsforschung.
15. Pearce D.W. and Atkinson G. D. 1993 Capital theory and the measurement of sustainable development: an indicator of "weak" sustainability. Ecological Economics, 8:103- 108
16. Salmanov, S. 2005 Azerbaijan- Forest Resources Assessment for Sustainable Forest Management. MENR
17. Scandizzo P. and Abbasov R. 2012 The Value of Water in the Greater Baku Area: An Integrated Water Management Study. World Bank Internal Document
18. SNC (Second National Communication of Azerbaijan to the Unites National Framework Convention on Climate Changes) 2010 MENR Baku, Azerbaijan http://unfccc.int/resource/docs/natc/azenc2.pdf last accessed: October 15, 2014
19. TEEB Foundations, 2010 In: Kumar,P.(Ed.), The Economics of Ecosystems and Biodiversity: Ecological and Economic Foundations. Earthscan, London, Washington
20. TEEB scoping study for Georgia 2013 http://www.teebweb.org/publication/teeb-scoping-study-for-georgia-main-findings-and-way-forward/ last accessed: October 15, 20

Figure I: Forest Map of Azerbaijan



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The Forest Law Enforcement and Governance (FLEG) II European Neighbourhood and Partnership Instrument (ENPI) East Countries Program supports participating countries' forest governance. At the regional level, the Program aims to implement the 2005 St. Petersburg FLEG Ministerial Declaration and support countries to commit to a time-bound action plan; at the national level the Program will review or revise forest sector policies and legal and administrative structures; and improve knowledge of and support for sustainable forest management and good forest governance in the participating countries, and at the sub-national (local) level the Program will test and demonstrate best practices for sustainable forest management and the feasibility of improved forest governance practices at the field-level on a pilot basis. Participating countries include Armenia, Azerbaijan, Belarus, Georgia, Moldova, Russia, and Ukraine. The Program is funded by the European Union.
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