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State of Forests of the Caucasus and Central Asia

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GENEVA TIMBER AND FOREST STUDY PAPER

Overview of forests and sustainable forest management in the Caucasus and Central Asia region

UNITED NATIONS
New York and Geneva, 2019

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ABSTRACT

The study on the state of forests in the Caucasus and Central Asia aims to present the forest resources and the forest sector of the region, including trends in, and pressures on the resource, to describe the policies and institutions for the forest sector in the region and to list the major challenges the sector faces, and the policy responses in place or planned. The study is a cooperative effort by the author, the UNECE/FAO secretariat and national experts, done with the use of the best available data. It attempts to cover all dimensions of sustainable forest management and includes national overviews of all countries of the region.

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FOREWORD

Forests cover a relatively small share of the vast Caucasus and Central Asian region. However, they encompass a wide variety of forest types and ecosystems, ranging from mountains, plains and flood plains to steppes, semi-deserts and deserts. These forest types are important to the environment of this region, as they include highly diverse but also vulnerable ecosystems, and support an extremely rich biodiversity and protect land against erosion and soil loss. Forests in the region also play an essential role in mitigating climate change, sequestering millions of tonnes of carbon dioxide but also alleviating the impacts of extreme weather events. In addition, forests are source of fuel, wood and income for often poor, rural populations of the region.

This report is based on the best available and most recent data and provides the first overview of the state of forests in the Caucasus and Central Asia, a region often overlooked in global debates on forests. This report provides findings on the status of and trends in forest resources in the region and focuses on: forest institutions in charge of forests, the social and economic aspects of forestry, and the sustainability of forest management.

All forests should be taken care of perpetually, this applies even more to the rare, vulnerable and extremely rich forests of the Caucasus and Central Asia. It is essential, in our opinion, to ensure that information and analysis about forests and forestry institutions in the Caucasus and Central Asia are developed and shared with relevant policy makers in the region and the international community. We hope the report will address the challenges of achieving the United Nations Sustainable Development Goals (SDGs), the objectives of the United Nations Strategic Plan for Forests and other international objectives and processes relevant to forests.

The study has been developed in a collaboration with international and national forestry experts from all countries of the region. We take this opportunity to thank, on behalf of the UNECE and FAO, all those who have made this study possible. We expect that this study will strengthen the UNECE and FAO capacity to support countries in their effort to: protect and manage their forests, develop national forest policies, implement sustainable forest management and provide a stable forest sector.

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ACKNOWLEDGEMENTS

This first study of the state of forests of the Caucasus and Central Asia (CCA) is the result of close cooperation and hard work by many people.

Kit Prins, author of this report, compiled the data, carried out the analysis and drafted the study.

The national experts of the eight countries of the CCA reviewed the draft country forests and forest sector overviews, correcting errors, providing new data and informed perspective to the analysis, and participated very constructively to the discussions at the workshop. Their contribution has been vital to the quality and reliability of the study. The experts are as follows: Ruben Petrosyan (Armenia); Sadig Salmanov (Azerbaijan); Merab Machavariani, Natia Tskhovrebadze, Antje Fischer (Georgia); Nurlan Raimkulov, Maxat Yelemessov (Kazakhstan); Venera Surappaeva (Kyrgyzstan); Hukmatullo Ahmadov (Tajikistan); Muhammet Durikov, Nury Atamuradov (Turkmenistan); Abduvokhid Zakhadullaev, Gairat Juraev (Uzbekistan).

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LIST OF ACRONYMS

$	US dollar unless otherwise specified
APA	Agency of Protected Areas (Georgia)
CBD	Convention on Biological Diversity
CCA	Caucasus and Central Asia
CEP	Committee on Environmental Protection (Tajikistan)
CFW	Committee on Forestry and Wildlife (Kazakhstan)
CO_2	Carbon dioxide
CPF	Collaborative Partnership on Forests
ENPI EAST	European Neighborhood and Partnership Instrument East Countries Forest Law
EU	European Union
FAO	Food and Agriculture Organization of the United Nations
FDD	Department for the Development of Forests (Azerbaijan)
FDS	Forestry Development Service (Azerbaijan)
FLEG II	Enforcement and Governance II Program
FLR	Forest landscape restoration
FOWL	Forest and other wooded land
FPY	FAO Forest Products Yearbooks
FRA	Global Forest Resources Assessment
FSC	Forest Stewardship Council
FTE	Full time equivalent
GDP	Gross Domestic Product
GHG	Greenhouse gas
Goskomles	State Committee of the Republic of Uzbekistan on Forestry (Uzbekistan)
ha	hectare
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature and Natural Resources
JFSQ	Joint Forest Sector Questionnaire (Eurostat, UNECE, FAO and ITTO)
LULUCF	Land use, land use change and forestry
m	meter
m^3	cubic meter
MCPFE	Ministerial Conference on the Protection of Forests in Europe (Forest Europe)
MCT	Ministry of Culture and Tourism (Azerbaijan)
NFA	National Forest Agency (Georgia)
NFI	National forest inventory
NFP	National forest programme
NGO	Non-governmental organization
NWFPs	Non-wood forest products
OECD	Organization for Economic Co-operation and Development
OWL	Other wooded land
PEFC	Programme for the Endorsement of Forest Certification
RE/cap	Roundwood equivalent per capita
REDD+	Reducing Emissions from Deforestation and Forest Degradation
SAEPF	State Agency for Environmental Protection and Forestry (Kyrgyzstan)
SCNP	State Committee for Nature Protection (Uzbekistan)

SDG	UN Sustainable Development Goal
SFF	State forest fund
SFM	Sustainable forest management
SFO	State forest organization
SNCO	State Non-Commercial Organization (Armenia)
SNNP	State national natural parks (Kazakhstan)
SNPA	State natural protected areas (Kazakhstan)
SNR	State natural reserves (Kazakhstan)
SPNT	State natural reserves (Kazakhstan)
SoEF	State of Europe's Forests
tCO_2e	Tonne of carbon dioxide equivalent
TJ	Terajoule
TEEB	The Economics of Ecosystems and Biodiversity
UN	United Nations
UNCCD	United Nations Convention to Combat Desertification
UNDA	United Nations Development Accounts
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
USSR	Union of Soviet Socialist Republics
WWF	World Wide Fund for Nature

EXECUTIVE SUMMARY

The study on the state of forests for the Caucasus and Central Asia aims to present the forest resources and the forest sector of the region, including trends and pressures on the resource, to describe the policies and institutions for the forest sector in the region and to list the major challenges facing the sector, and the policy responses in place or planned. It is a cooperative effort between the UNECE/FAO Forestry and Timber Section and national experts, using the best available data. It is based on country forests and forest sector overviews, which are presented in Annex 3 and attempt to cover all dimensions of sustainable forest management.

Context

The region as a whole has a harsh climate with mountains and deserts. Most countries are landlocked and classified as middle income by the World Bank, although some have access to significant oil and gas reserves. About half the population live in rural areas, and there is some extreme poverty. After a long and varied history at the meeting point of many cultures and civilisations, all countries in the region were part of the Soviet Union but became independent after its collapse. They thus have a common administrative and legal background, even though the direction and speed of development since independence differs widely between the countries.

FIGURE 1

Geygel National Park, Azerbaijan

Source: S. Salmanov,Tbilisi, 2018.

Pressures on the forest resource

Almost all countries in the region have very low forest cover, between 4% and 13%. The exception is Georgia with 41% (Table A). There is a wide variety of forest types, including mountain forests, xerophyllous forests (shiblyak), forest steppe, fruit/nut forests, desert and semi-desert forests and flood plain (tugai) forests as well as shelterbelts and planted forests. All over the region, there are strong anthropogenic pressures on the forests, notably from fuelwood demand for local communities, leading to illegal/excessive logging, as well as from overgrazing, leading to forest degradation, and from irrigation and hydroelectric schemes along the rivers, leading to loss of forest cover.

Services and goods supplied by the forests

Services and goods supplied by the forests:

- The primary function of forests all over the region is protection against erosion and soil loss in highly vulnerable ecosystems. 89% of the forest and other wooded land is designated for protective functions, although these functions also apply to other areas. The importance of this function is officially recognised at the policy level, so that final wood harvesting is forbidden by law in many areas.
- Large areas (1.8 million ha, or 11% of the area of forest and other wooded land) are devoted to conservation of biodiversity.
- Almost all forests supply fuelwood for local communities, often at unsustainable rates. At least 80% of removals, probably more because of unrecorded fellings, are for fuelwood.
- In many areas, the non-wood products from the forests make a significant contribution to rural livelihoods: nuts (pistachio, walnut, almond, hazelnut), fruit and berries, hay, medicinal herbs, mushrooms, honey, flower bulbs, tree seeds etc.
- Grazing on forest land plays an important role in these rural communities.
- According to available data, forests in the region are a carbon sink of over 25 million tCO_2e per year. However, this estimate is based on unreliable forest inventory data and may hide a more negative situation.
- Thirty-four thousand people are recorded as employed, but probably the number of people generating an income from forests is underestimated, because of illegal/unrecorded forest activities.
- Forestry contributes to rural livelihoods in many ways, although there is no quantified information on this available at present.

Legal, policy and institutional framework

There was an uncertain period after independence, but now all eight countries of the CCA have a forest law and statements of forest policy/strategies, although some of these are not recent. Four countries have national forest programmes. In many countries, national development strategies or strategies for poverty reduction or environment specifically refer to forest policy, thus providing policy level visibility and commitment. However, sometimes sufficient resources are not assigned, and monitoring is often not carried out.

In all eight countries, all forests are publicly owned, mostly through a state forest fund, which imposes specific rules on the land concerned. However, not all the land in the state forest funds has forest on it, and sometimes there is forest outside the state forest fund. The study lists which department or agency is responsible for policy formulation, policy monitoring and enforcement and for managing state forest fund lands.

In all countries there are local forest agencies which implement forestry measures on the ground, but in some, these are tightly controlled and run from the centre, while in others, these local management units (often referred to as *leskhoz*) are quite autonomous or answer to separate local authorities. Almost all the funding for forest management comes from the central State budget, as there are few opportunities for the local units to generate revenue from their activities. Given the low economic and policy visibility of forest issues, most of these management units are underequipped and underfunded, to the extent that they are unable to carry out satisfactorily their mission of sustainable forest management.

Forest degradation and forest landscape restoration

In the region, many forests have been destroyed or degraded, leading to a demand for forest landscape restoration. In June 2018, under the auspices of the Bonn Challenge, seven of the countries in the region met in the Ministerial Roundtable on Forest Landscape Restoration in the Caucasus and Central Asia and six of them committed to identify degraded lands and work to restore and afforest them by 2030.

Conclusions and challenges for the future

The conclusions, reviewed by the workshop, identified the main issues, as described above, as well as the main challenges for the future which may be summarised as follows:

FIGURE 2

Damaged forests in Uzbekistan

Source: Presentation, A. Zakhadullaev, Tbilisi, 2018.

- To maintain and restore existing forests, reducing illegal logging and overgrazing.
- To increase the benefits provided by forests to society.
- To improve the information base for evidence based sustainable forest management.
- To identify and apply best practice in forest management.
- To improve coordination of the various agencies with activities relevant to forests.
- To develop strategies for progress towards sustainable forest management, assign necessary funding and implement them fully.
- To decentralise, to the extent possible, decision making in the forest sector.
- To provide adequate education and training to all those active in the forest sector, after a comprehensive assessment of skills needs.
- To improve social protection and provide decent working and financial conditions for forest workers; in this way, to improve the attractiveness and prestige of forest professions.
- To strengthen forest sector institutions, by allocating sufficient resources from the central budget, as well as removing bureaucratic structures and processes, while maintaining sufficient monitoring and responsibility.
- To integrate sustainable forest management into national development and poverty reduction strategies.
- To improve communication on forest issues, with policy makers, relevant stakeholders and the public.
- To improve organization and coordination of international aid projects, avoiding their duplication and fragmentation while supporting their complementarity, sustainability and coherence with national strategies.

TABLE A

Overview of the forest resource and supply of services and goods, around 2015

	Forest and other wooded land (FOWL)	*FOWL as % of total land*	*Share of public ownership of forest land*	*Share of forest area designated for protective functions*	*Share of forest area conserved for biodiversity*	*Employment per 1,000 ha of forest*	*Estimated total harvest*
	1,000 ha	%	%	%	%	FTE/1,000 ha	1,000 m^3
Armenia	395	13.3	100	67.1	33.2	9	536
Azerbaijan	1,139	13.2	100	77.5	10	1.8	90
Georgia	2,829	40.6	100	78	9.5	0.6	3,000
Caucasus	4,364	23.4	100	77	11.4	1.6	3,626
Kazakhstan	12,904	4.7	100	97.4	20	3.2	371
Kyrgyzstan	1,663	8.3	100	93	6.2	2.3	18
Tajikistan	563	4	100	73.3	26.1	4.8	9
Turkmenistan	4,264	8.7	100	100	2.4	0.4	10
Uzbekistan	3,369	7.5	100	82.5	12	3.1	36
Central Asia	22,763	5.7	100	93.2	10.8	2.2	525
Caucasus and Central Asia	27,127	6.5	100	89.1	11	2	4,151

Source: Forests and forest sector overviews in Annex 3.

1.

INTRODUCTION

1. Introduction

Background and mandate

The eight countries of the Caucasus and Central Asia have a total area of nearly 420 million ha and a total population of about 85 million people. Available information shows that they have nearly 30 million ha of forest and other wooded land, a forest cover of only 6.5%, and that these forests are under pressure. Yet these forests play a vital ecological role, in fighting erosion and desertification, as well as in helping to provide livelihoods for rural populations. However, little is known outside specialised circles of the contribution of these forests to sustainable development and of the strong pressures affecting them. For these reasons, the UNECE Committee on Forests and the Forest Industry and the FAO European Forestry Commission have included in their activities for 2019 "Study of the Caucasus' and Central Asia's Forests: conclusion and release of the publication (English and Russian)", as part of the implementation of the Warsaw Integrated Programme of Work, under Item 24. This is a pioneering effort as it appears that there has been no overview of the region's forest sector since the countries became independent in the 1990s.

The objectives of the study are:

- To describe the forest resources and the forest sector of the region, including trends, and pressures on the resource.
- To describe the policies and institutions for the forest sector in the region.
- To list the major challenges facing the sector, and the policy responses in place or planned.

It is hoped that this will improve the visibility and understanding of the forest sector in the region, to national policy makers and the international community. The study might also help to encourage regional dialogue and cooperation on forest related issues, and efforts to improve the situation as regards data availability and quality.

Process of preparing the study

The study preparation included the following stages:

- The author collected data from national and international sources (see next section) and drafted a short national forests and forest sector overview for each country, following a standard format.
- The draft overviews were circulated for comment and review to national experts, starting a process of dialogue, on data, and on the conclusions which could be based on them. Comments were received from the national experts of all eight countries.

FIGURE 3

Forest in Georgia

Source: Presentation, M. Machavariani, Tbilisi, 2018.

FIGURE 4

Participants of the workshop in Tbilisi (Georgia) in December 2018.

Source: UNECE/FAO Forestry and Timber Section.

- A draft study, based on the revised forests and forest sector overviews, was drafted and shared with national experts.
- The draft study, together with forests and forest sector overview, was reviewed at a workshop in Tbilisi (Georgia) in December 2018.
- The study was finalised in the light of the workshop's discussions and further input from experts.

This process benefited enormously from the dialogue between the author, the secretariat team and the national experts, who contributed their experience and judgement in a situation characterised by poor data quality. Nevertheless, the final responsibility for the study lies with the secretariat.

Data sources and data quality

There are many shortcomings in the data availability and quality for countries in the region: responses to the FAO Forest Resources Assessment 2010 and 2015 were often incomplete, or missing, and at the national level, in many countries, there are few recent objective inventories. When data are available they are sometimes based on "forest accounts" (reports by local forest managers to a central authority), which are known to have problems of coverage (forests or other wooded land not managed by the State organisation are not properly covered) and distortion (often reporting bodies have an incentive to report favourable trends to their superiors). Inventories which are based on an independent network of sample plots, often with the help of remote sensing, do not suffer from these drawbacks. Sample based inventories are now the standard approach in most parts of the UNECE region.

Furthermore, unrecorded felling of significant volumes of wood is frequent in many parts of the region, and there have been few efforts to generate robust estimates of the volumes concerned. As a consequence, there is huge uncertainty about the sustainability of the balance between increment and harvest, neither of which is objectively monitored in most countries, or indeed about the sustainability of supply of the other goods and services of the forest.

The author used the official data available, from international and national sources, supplemented with occasional studies, notably by the development community. These data were reviewed and revised by the national experts who contributed their own data sources and experience of trends on the ground, and the resulting figures were used in this report. Detailed information about sources of data and methods of estimation is available at: http://www.unece.org/forests/areas-of-work/forest-resources/outputs.html.

The main international sources used were:

- FAO Global Forest Resources Assessment (FRA), 2010 (FAO, 2010) and 2015 (FAO, 2015).
- FAO Land Use database.
- FAO Forest Products Yearbook (production and trade of forest products), (FAO, 2016).
- UN Demographic Yearbook (population, rural residents), (UN, 2017).
- World Bank (GDP/head, extreme poverty) (World Bank, 2017).
- UN Framework Convention on Climate Change national reports (greenhouse gas flows to forests), (UNFCCC, 2017).

Thanks to this process, it is hoped that the data used in this study are the ***best available estimates***. However, they should not be taken as a basis for detailed analysis, but as a starting point for a description of the situation. In fact, in almost all the countries, a first step to evidence-based policy making for the forest sector is a radical improvement in the quality of data available to policy makers, as regards precision, scope and frequency.

In particular, it would be desirable for all countries in the region to consider what forest related parameters are needed for policy making, as well as for reporting to international organisations. The latter include not only FRA (improved information about region's forests is expected in the next, 2020 assessment), but also the Sustainable Development Goals, one of which (15.2.1) addresses sustainable forest management, and the reporting under the United Nations Strategic Plan on Forests. There are also reporting obligations under other forest related commitments, such as climate change (greenhouse gas balances, including land use, land-use change, and forestry (LULUCF)) and biodiversity (Aichi Biodiversity Targets). In addition, it is now recognised that the traditional forest information parameters (forest area and growing stock) are not fully adequate for policy making. The socio-economic aspects of forest management, such as livelihoods of forest dependent people and employment in forestry as well as information on forest health and vitality are now recognised as central to forest policy making. Policy/institutional information, for instance on national forest programmes, forest management plans, forest certification and traceability of forest products is also central to monitoring progress towards sustainable forest management. A Global Core Set of 21 forest related indicators (see more information at: https://undocs.org/E/CN.18/2018/4) has been drawn up by the Collaborative Partnership on Forests (CPF) Task Force and was acknowledged by the United Nations Forum on Forests. The set has been used as a conceptual framework for the analysis of the forest sector of the countries of the Caucasus and Central Asia, as of other regions.

2.

CONTEXT

2. Context

Present conditions for forests in the Caucasus and Central Asia derive from climatic conditions, and human influence over centuries.

Many parts of the region have harsh climate conditions, which are often not conducive to forests or which impose severe limitations on the type of forest which can be maintained there on a sustainable basis. There are high mountains, including the Caucasus, Tienshan and Pamir-Alai ranges, as well as deserts, including the Karakum and Kyzylkum. Two great rivers, the Amu Darya and Syr Darya flow from the mountains towards the Aral Sea, but no longer reach it as human activities, notably irrigation, have extracted excessive volumes of water.

All the countries in the region, except Georgia, are landlocked[1]. Uzbekistan is one of only two countries in the world which are double landlocked. The lack of access to the world's oceans is a significant obstacle to trade and increases costs.

The total land area of the region is 419 million ha, 400 million ha in Central Asia and 19 million ha in the three countries of the Caucasus region (Table 1). One country, Kazakhstan, accounts for 65% of the land area of the whole region. The population of the region is over 85 million people, of which 71 million in Central Asia. Uzbekistan has a population of nearly 33 million people, 37% of the regional total. Population density is rather low, with a regional average of 0.2 person/ha, but ranges from 0.1 person/ha in Kazakhstan and Turkmenistan to over 1 person/ha in Armenia and Azerbaijan. All over the region, but especially in Central Asia, there are large areas of desert or mountain with very sparse populations. To place these data in a regional context, population density in the Russian Federation, which also has large areas of sparsely populated land, is 0.1, in Iran 0.5 and in Turkey 1.

[1] Three countries in the region have access to the Caspian Sea, but this sea is itself landlocked.

FIGURE 5

Mountain landscape of Kazakhstan

Source: Presentation, M. Yelemessov, Tbilisi, 2018.

TABLE 1

Area and population, around 2017

	Area	*Population*	*Population density*	*Share of rural population*	*Area of forest and other wooded land (FOWL)*	*FOWL/head*
	Million ha	Million	Person/ha	%	Million ha	ha/cap
Armenia	3	3	1	36.4	0.39	0.13
Azerbaijan	8.7	9.6	1.1	46.9	1.14	0.12
Georgia	7	3.7	0.5	42.8	2.8	0.76
Caucasus	18.6	16.4	0.9	44	4.4	0.27
Kazakhstan	272.5	18	0.1	42.9	12.9	0.72
Kyrgyzstan	20	6.1	0.3	66.3	1.7	0.27
Tajikistan	14.2	8.9	0.6	68.1	0.6	0.06
Turkmenistan	48.8	5.7	0.1	47.7	4.3	0.75
Uzbekistan	44.7	32.9	0.7	46.9	3.4	0.1
Central Asia	400.2	71.5	0.2	49.3	27.1	0.31
Caucasus and Central Asia	418.8	87.9	0.2	49.3	27.1	0.31

Source: Forests and forest sector overviews in Annex 3.

Over half the population of the Caucasus and Central Asia lives in rural areas. This ratio varies from 36% in Armenia to 73% in Tajikistan, but for most countries is between 40% and 50%.

In 2017, GDP/head in the region ranged from $800 to $9,030 (Table 2). All the countries except one (Tajikistan) are considered "middle income" by the World Bank. The presence or absence of oil and gas reserves plays a major role: the two countries with the highest GDP/head, Kazakhstan and Turkmenistan, are both major suppliers of oil and gas.

TABLE 2

Economy and livelihood of the Caucasus and Central Asia, around 2017

	GDP/head	*Share of population in extreme poverty*
	$	%
Armenia	3,937	2.3
Azerbaijan	4,132	0.5
Georgia	4,057	9.8
Kazakhstan	9,030	0.1
Kyrgyzstan	1,220	1.3
Tajikistan	801	19.5
Turkmenistan	6,586	NA
Uzbekistan	1,534	NA

Source: World Bank 2017.

There is a commitment under the United Nations Strategic Plan on Forests to "eradicate extreme poverty in forest dependent people" by 2030 (Target 2.1). No information is available at present on how many forest dependent people are living in extreme poverty in the Caucasus and Central Asia. However, the rate of extreme poverty (forest dependent and not forest dependent) at the national level is relevant to this commitment. In Tajikistan, nearly 20% of the population are reported as living in "extreme poverty", defined as income below $1.90/day, and in Georgia nearly 10%. No recent data on extreme poverty were available for two countries (Turkmenistan and Uzbekistan). More information is urgently needed on forest dependent people in extreme poverty, as this may be a significant, but unrecognised, problem in the region.

The Caucasus and Central Asia countries generally have low forest cover. Forest and other wooded land (FOWL) account for about 8% of total land area, with most countries in the range of 4-13%. The exception is Georgia with forest cover over 40%.

FIGURE 6

Forest in Azerbaijan

Source: Presentation, S. Salmanov, Tbilisi, 2018.

In earlier centuries, forest cover was higher, even 65% for Georgia, but a succession of pressures on the resource have destroyed or degraded the forests, which have not been able to recover spontaneously because of the harsh growing conditions and continuing human pressures. Although data are rare, and there is no single authoritative account for the region, there seem to have been a number of major episodes influencing forest cover in the region over the last two centuries:

- Increase in population and economic activity during the Tsarist period, reinforced by improvement of the transport infrastructure, connecting the region with wood markets elsewhere, and increasing demand for wood.
- Social and economic upheaval during the establishment of Soviet power during the 1920s, forcing local populations to turn to their forests for energy and raw material.
- Strong demand for timber and fuelwood during the pre-war industrialization, the war and the reconstruction period, for local populations and for other parts of the USSR, putting strong pressure on the forests.
- In the 1950s and 1960s, the Soviet authorities decided that the USSR's wood needs should not be satisfied from the Caucasus and Central Asia and classified almost all the region's forest as "Group 1", with priority given to protection functions: wood harvesting (final cuts) was severely restricted. Wood, wood products and energy were imported from other parts of the USSR, reducing the pressure on the forests of the Caucasus and Central Asia.

After independence of the countries in the region the internal trade patterns of the USSR were destroyed, and the region's forests had to supply sudden strong demand for construction wood and, above all, for energy (imports of oil, coal and gas

were suddenly stopped, as trade relations collapsed), all in a period of rapid institutional change. Forest institutions were starved of resources. Conflicts strengthened the pressure. In a difficult period of rapid change and great tension, as well as enormous problems for State budgets, and governance in general, forest matters had low political priority.

At present the economic and social situation seems to be stabilising in the region, although the pressures on the forest continue. There have been a number of reviews, strategies and plans as well as institutional changes, in a more stable and positive economic and social context. These developments will be examined in detail below.

3.

CHARACTERISTICS OF FORESTS IN THE REGION

3. Characteristics of forests in the region

In the region, there are nearly 27 million ha of forest and other wooded land, including 22.6 million ha in Central Asia, and 4.4 million ha in the three Caucasus countries (Table 3). It is often difficult to make a clear distinction between "forest" and "other wooded land", which has lower crown cover and more shrub type vegetation. In fact, 9.5 million ha of other wooded land are in Kazakhstan and are essentially the saxaul forests of the semi-desert areas. The Caucasus region has higher forest cover (23%) than Central Asia (6%). The data show a small annual decline in area of forest and other wooded land between the last Soviet inventory and the most recent data. However, as mentioned above, there are many problems with data quality, as well as of comparability with the 1988 data, so it is not possible even to make estimates of trends over the period. The forest growing stock of the region is estimated at 1.2 billion m^3, of which about 0.4 billion m^3 each in Georgia and Kazakhstan, which together account for nearly 75% of the region's growing stock. Growing stock per hectare is over 100 m^3/ha in the Caucasus and Kazakhstan, but much lower elsewhere in Central Asia.

FIGURE 7

Mountain forests near Almaty, Kazakhstan

Source: iStock.

3.1 Main forest types

Due to the variety of the climatic conditions there are many forest types in the Caucasus and Central Asia, but they mostly fall into one of the following seven categories (this has no pretention to be a scientific classification, rather an attempt to make a synthesis of the detailed national reports, which can be found in the national forests and forest sector overviews):

TABLE 3

Forests and other wooded land in the Caucasus and Central Asia

	Forest (around 2015)	*Other wooded land (around 2015)*	*Forest and other wooded land (FOW) (around 2015)*	*FOWL as % of total land*	*Average annual change in FOWL, 1988-2015*	*Growing stock-forest (around 2015)*	*Growing stock-forest per hectare (around 2015)*
	1,000 ha	1,000 ha	1,000 ha	%	%	Million m^3	m^3/ha
Armenia	332	63	395	13.2	0.7	42	126
Azerbaijan	1,139	-	1,139	13.2	0.6	149	131
Georgia	2,822	7	2,829	40.6	0.1	455	161
Caucasus	**4,294**	**70**	**4,364**	**23.4**	**0.2**	**645**	**150**
Kazakhstan	3,397	9,507	12,904	4.7	0.9	422	124
Kyrgyzstan	1,252	411	1,663	8.3	2.3	48	38
Tajikistan	421	142	563	4	-0.9	5	12
Turkmenistan	4,264	-	4,264	8.7	-1.8	15	3
Uzbekistan	3,254	115	3,369	7.5	-0.4	55	17
Central Asia	**12,588**	**10,175**	**22,763**	**5.7**	**-0.2**	**545**	**43**
Caucasus and Central Asia	**16,882**	**10,245**	**27,127**	**6.5**	**-0.2**	**1,190**	**70**

Source: Forests and forest sector overviews in Annex 3.

- ***Mountain forest***. In all three Caucasus countries, as well as those Central Asian countries with significant mountain ranges, forests occur up to the timber line. Main species include juniper, beech, oak and spruce. These forests are often remote and vulnerable, unless specially protected as part of management for biodiversity conservation or protection of soil and water. Their loss or degradation increases the risk of erosion, and of the definitive loss of fertile land.

FIGURE 8

The xerophilous mountain forests (shiblyak), Tajikistan

Source: ANSOR, 2018. Available at: http://life.ansor.info/rasteniya-tajikistana

- ***Xerophilous mountain forests (shiblyak)*** with pistachio, almonds and bagryaniki (Cercis spp.), similar to the Mediterranean maquis.
- ***Forest steppe*** in the north of Kazakhstan, an ecoregion of pine groves interspersed with grasslands that forms a transition between the Kazakh steppe and the forests of Siberia. In the sandy soils of this forested steppe, pines grow in long belts, creating so-called "ribbon forests" that tie together a diverse mix of habitats.

FIGURE 9

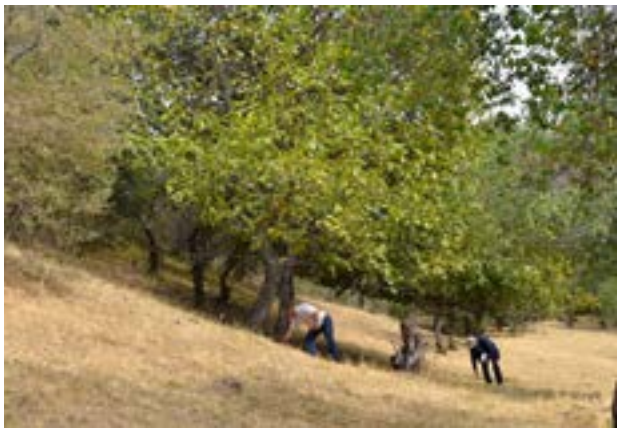
Steppe forest, Kazakhstan

Source: iStock.

- Broadleaved ***fruit/nut forests*** with walnut and apple trees, supplying significant amounts of non-wood products for local populations and for sale.

FIGURE 10

Pistachio forest, Turkmenistan



Source: Image by Cholpon Uzakbaeva, Mongabay, 2018

- Drought-resistant ***desert and semi-desert*** forests, in areas where there is little other vegetation, because of very low precipitation, often with high salt levels, for instance in the area around and in the Aral Sea. Few trees can grow in these conditions. Exceptions are saxaul species, which resist salt and grow slowly, but fix desert sands to some extent. Because of their slow growth rates, these forests are particularly vulnerable, as well as being especially important in controlling damage from desertification, such as windblown sand, and loss of what little soil remains.

FIGURE 11

Desert forest in Turkmenistan

Source: Presentation, M. Durikov and N. Atamuradov, Tbilisi, 2018.

- ***Flood plain*** (tugai) forests, along the rivers of the region, with a mixture of water loving species. These forests have been much reduced by human actions, notably irrigation and other efforts to use the water in the rivers, e.g. for hydroelectricity.
- Trees and forests planted, mostly in agricultural land, as ***shelterbelts or as suppliers of fuelwood***. Several countries intend to increase significantly the area of these types of forest.

FIGURE 12

Flood plain (tugai) forest, Uzbekistan

Source: Presentation, A. Zakhadullaev, Tbilisi, 2018.

FIGURE 13

Shelterbelt forest in Turkmenistan

Source: Presentation, M. Durikov and N. Atamuradov, Tbilisi, 2018.

FIGURE 14

Forest map of Central Asia

Source: Zoï Environment Network. 2015. Available at: https://zoinet.org/wp-content/uploads/2018/02/SOE-regional-eng.pdf

FIGURE 15

Map of the Caucasus region.

Sources: CEO-Caucasus-2002, UNEP; Geopolitical Atlas of the Caucasus, Autrement, 2010. Map by Manana Kurtubadze, GRID-Arendal, 2015

3.2 Pressures on the forests of the Caucasus and Central Asia

There are many pressures on the forests of the region, which are described in the national forests and forest sector overviews. However, the same pressures recur over the whole region, and are summarised below.

- Fuelwood demand by local communities, leading to illegal/excessive logging. There is widespread rural poverty in the region, and modern fuels are expensive, since the collapse of the USSR internal trade system. In many cases, rural communities have little alternative to wood for cooking and heating, especially during the harsh winters. As a consequence, wood removals, legal and illegal, are at a high level. This pressure has been exacerbated by the use of inefficient stoves, as more wood is needed for the same level of heat supply. It is noteworthy that where a government has been able to make available modern fuels, such as gas, at an affordable price, illegal logging for fuelwood has dropped significantly – in those communities which now have access to affordable modern fuels. Depending on the institutional environment, villagers may harvest the wood themselves, or be supplied by local forest enterprises or middlemen. The saxaul forests are particularly vulnerable, as they have very low growing stock (so more area is needed to satisfy the same demand), and the forests do not regenerate satisfactorily when degraded, because of the harsh, dry and salty environment.
- In the Caucasus and Central Asia, half the population lives in rural areas and is highly dependent on agricultural activities, although there is not enough arable land of sufficient quality. The result is dependence on grazing, of cattle, goats, sheep and horses. Rural tenure systems vary,

but often the animals are grazed on communal land, to which all residents have access, including land with and without tree cover, some of which is forest fund land. In fact, significant parts of the state-owned forest fund land are officially devoted to grazing; managing grazing on state-owned land is often one of the main activities of local forest enterprises. Many sources say that overgrazing is a major pressure on forests, which are degraded by too many animals being given access, preventing regeneration and reducing tree cover.

- Along the rivers, irrigation schemes, notably for cultivation of cotton and wheat, have been implemented, as well as hydroelectric schemes. As a result, in some areas, flood plain forests (tugai) have been removed.

In addition to the anthropogenic pressures mentioned above, the forests of the region are vulnerable to a wide variety of natural hazards, including erosion, soil loss and landslides in mountain areas, and along water courses, and desertification, increased salinity and windblown sand. They are vulnerable to these non-anthropogenic pressures and also play an important role in controlling them.

4.

SERVICES AND GOODS SUPPLIED BY THE FOREST

4. Services and goods supplied by the forest

This section describes, and, to the extent possible, quantifies the goods and services provided by the forests of the Caucasus and Central Asia, based on the information collected for the national forests and forest sector overview. The sources for the data are given in the forests and forest sector overviews. In many cases, the data quality is quite low, but it is believed the overall picture is not misleading. No detailed quantitative analysis has been attempted.

The broad characteristics of the forest resource as regards naturalness, health and vitality, ownership and management are presented in Table 4.

FIGURE 16

Forest in Kyrgyzstan

Source: Presentation V. Surappaeva, Tbilisi, 2018.

TABLE 4

Characteristics of the forest resources, around 2015: percentage of total forest area

	Primary forest	*Plantations*	*Public ownership*	*Managed by State forest agency*	*Under long term management plan*	*Disturbed*
Armenia	51	7	100	83	89	3.7
Azerbaijan	-	22	100	-	-	-
Georgia	18	3	100	94	13	-
Kazakhstan	-	26	100	22	100	1.4
Kyrgyzstan	28	0	100	52	61	0
Tajikistan	70	0	100	95	-	-
Turkmenistan	2	0	100	100	100	0
Uzbekistan	2	25	100	100	100	0.8

Source: Forests and forest sector overviews in Annex 3.

TABLE 5

Services provided by the forests of the Caucasus and Central Asia

	Share of forest area designated for protective functions	*Share conserved for biodiversity*	*Employment*	*Net GHG flow (- = sink)*
	%	%	FTE/1,000 ha	tCO_2e/ha
Armenia	67	33	9	-1.67
Azerbaijan	77	22	1.8	-4.78
Georgia	78	10	0.6	-1.95
Kazakhstan	100	20	3.2	-3.27
Kyrgyzstan	93	6	2.3	-0.64
Tajikistan	73	26	4.8	-1.45
Turkmenistan	100	2	0.4	-0.20
Uzbekistan	82	12	3.1	-0.17

Source: Forests and forest sector overviews in Annex 3.

The share of primary forest is reported as between 2% and 70%, although this wide range would seem to indicate problems of inter-country comparability. Likewise, the share of plantations varies between 0% and 26%. All forest in the region is publicly owned, and in many countries managed by the State forest organisation. The long-term management plans at the core of the Soviet forest management system have mostly reached the end of the planning period and are being replaced by other systems. These institutional questions are discussed below.

The section addresses protective functions, biodiversity conservation, supply of wood, supply of non-wood products and services, climate change mitigation and employment. Data are presented in Table 5 and discussed below.

4.1 Protective functions of the forest

The forests of the Caucasus and Central Asia protect the ecosystems and people of the region from a wide variety of natural hazards, including erosion, soil loss and landslides in mountain areas, excessive evaporation along water courses, and desertification, increased salinity and windblown sand. Typically, in these cases, the mere presence of a healthy forest provides these protective services. These services are seen in the region as a common good to be provided, free of charge, by national governments. This situation was recognised by the Soviet authorities in the 1950s and 1960s when practically all the forests in the region were classified as Group 1[2]. Although the classification and administrative systems vary between countries, the overriding importance of the protection function of forests is recognised officially, and at the highest policy level, all over the region. In most of the forests of the region, final cuts (clearcuts, to provide industrial wood) are forbidden, or severely limited. The share of forests formally "designated for protective functions" varies from 50% to 100%, but in practice the protective function has priority, in theory at least, over all other functions of the forest in all parts of the region. According to data collected for the forests and forest sector overviews, mostly originating in the FRA process, but with weak inter-country comparability, over 15 million ha have a "designated management objective to maintain and enhance its protective functions", which is nearly 90% of the region's forests.

Without having a forest inventory/monitoring system in place it is not possible to quantify the consequences of actual or potential forest loss or degradation for the protective functions, in terms of erosion, soil loss, increased salinity, accelerated desertification, increased sandstorms etc. Such quantification, either in physical or economic terms would provide powerful ammunition for policy discussions on the resources which should be made available for forest protection. There have been proposals by TEEB (The Economics of Ecosystems and Biodiversity) to carry out studies, for instance in Azerbaijan: such studies, carried out across the region, would contribute to justifying greater investment in forest conservation (Abbasov, 2014). It is highly likely that the benefits, to ecosystems and economies, of sustainably managed protection forests outweigh any economic costs of managing and protecting those forests. At present, however, there is no system of payment for forest ecosystem services in place in the region, even though the importance of these services is officially recognised.

FIGURE 17

Park zone in Turkmenistan

Source: Presentation, M. Durikov and N. Atamuradov, Tbilisi, 2018.

4.2 Conservation of biodiversity

The region contains many valuable habitats for biodiversity. Indeed, the Caucasus and the "Mountains of Central Asia" figure on a list of the planets' "biodiversity hotspots". All countries in the region have a system of protected areas, which includes forest areas. Statistics on forest area protected for biodiversity conservation are notoriously not comparable between countries, but, according to the sources used for the national overviews, 1.8 million ha of forest in the region are

[2] "Forests of **the first group** include forests mainly with the water-protective function, protective, sanitary-hygienic, recreational and other useful functions, as well as specially protected natural areas. According to the functional significance, the forests of the first group are divided into categories of protection" (Federal Forestry Agency of the Ministry of Natural Resources of the Russian Federation, 2006).

protected for biodiversity conservation, under a wide variety of legal regimes. About 11% of forests in both the Caucasus and Central Asia are reported as protected for biodiversity conservation. The reported share of protected forest varies from 2% in Turkmenistan to 33% in Armenia, although, given the differences between regimes included under this heading, these differences may not be as large as they appear. It is unfortunately not possible to take into account here the effectiveness of the conservation regimes in place.

In several countries, protected forests are managed by different agencies than those responsible for "managed" forests. The agencies responsible for managing forests designated for biodiversity conservation are usually under the responsibility of a specialised section of the Ministry for Environment.

4.3 Wood supply

According to official removals statistics, notably the FAO Forest Products Yearbook, which is based on official replies to the Joint Forest Sector Questionnaire, the region's forests supply about 1 million m^3 of wood every year. However, it is recognised that this is a severe underestimate, because of informal/illegal fellings, almost all for fuelwood. Various estimates have been made, and incorporated into the national overviews, which raise the total to about 4 million m^3 (Table 6), of which 3 million m^3[3] in one country, Georgia. However, this is certainly also an underestimate as three countries, Kyrgyzstan Turkmenistan and Uzbekistan, were not able to supply an estimate of unreported fellings. The reports and assessments which address this issue mostly start from the assumption that there is much unreported felling, and that this felling is probably not at a sustainable level.

It is clear however that in countless rural areas all across the region, wood is a central, frequently vital, part of the energy supply, both for heating and cooking.

By contrast, the volume of wood supplied to the region's forest industries, estimated at less than 1 million m^3 (Table 7), is relatively small. Consumption of forest products per head in most countries, is at a relatively low level, with a regional average of about 0.2 m^3 roundwood equivalent per head. About 12% of the region's consumption comes from domestic sources, although the degree of self-sufficiency is higher in three countries: Armenia, Georgia and Kazakhstan. Most consumption of forest products is satisfied by imports, from the Russian Federation, Turkey, China and other countries.

[3] For Georgia, the number of total annual illegal harvest is uncertain and is estimated by the studies, that does not correspond to the officially reported figures.

TABLE 6

Wood supply, around 2015

	Estimated total harvest	*Estimated fuelwood supply*	*Share of fuelwood*	*Energy value of fuelwood*	*Ratio total harvest to growing stock*
	1,000 m^3/year	1,000 m^3/year	%	TJ	%
Armenia	536	532	99	4,430	1.3
Azerbaijan	90	90	100	750	0.1
Georgia	3,000	2,300	77	19,166	0.7
Caucasus	3,626	2,922	81	24,346	0.6
Kazakhstan	371	238	64	1,983	0.1
Kyrgyzstan	18	9	50	76	0
Tajikistan	90	90	100	750	1.8
Turkmenistan	10	10	100	83	0.1
Uzbekistan	36	26	72	217	0.1
Central Asia	525	373	71	3,109	0.1
Caucasus and Central Asia	4,121	3,295	79	27,455	0.3

Note: For Kyrgyzstan, Turkmenistan and Uzbekistan only recorded harvest is reported; no estimate available of unrecorded removals.

Source: Forests and forest sector overviews in Annex 3.

TABLE 7

Production, consumption and trade of forest products, around 2015

	Production of sawnwood	*Consumption of forest products*	*Self-sufficiency in forest products*	*Main suppliers (% of total imports)*
	1,000 m^3	m^3 RE/cap	%	
Armenia	4	0.07	19.9	Turkey (19%), Russian Federation (12%), China (11%)
Azerbaijan	0	0.14	2	Russian Federation (52%), Turkey (22%)
Georgia	61	0.16	29.7	Turkey (47%), China (11%), Ukraine (9%)
Caucasus	65	0.13	11.4	
Kazakhstan	232	0.24	32.2	Russian Federation (53%)
Kyrgyzstan	86	0.31	7.3	Russian Federation (54%), China (9%), Kazakhstan (8%)
Tajikistan	0	0.15	0	Russian Federation (66%), China (12%), Turkey (11%)
Turkmenistan	0	0.15	0	Turkey (40%), Russian Federation (32%)
Uzbekistan	25	0.16	2.6	Russian Federation (75%)
Central Asia	343	0.19	12.2	
Caucasus and Central Asia	408	0.18	12.1	

Note: "self-sufficiency" is calculated as production of forest products as a percentage of consumption of forest products, both in m^3 raw material equivalent.

Source: Forests and forest sector overviews in Annex 3.

4.4 Non-wood products and services

In many forests, non-wood products and services are more important for rural livelihoods than wood supply. They take many forms, depending on the local situation (Table 8). Some of these are briefly listed below:

- ***Grazing*** is often a key service, using both the pastures surrounding the forests, and the forest land itself. Sometimes the forest managers use the grazing for their own animals, especially where the local forest enterprises are responsible for pasture land as well as forest land. Elsewhere, the owners of the animals use the forest/pasture lands, either through a system of communal rights, or by paying for this use. In many cases, it appears that overgrazing is allowed, or cannot be prevented, so that forests are degraded, or even cleared. Depending on the arrangements in place (which vary widely), most of the actors have no long-term tenure rights, so they have no incentive to manage the forest and grazing resources on a sustainable basis. In FRA 2015, many countries also mentioned ***hay*** as a non-wood product supplied by forests, which is clearly linked to grazing activity.
- Several forest regions have natural or semi-natural ***fruit and walnut*** forests, providing apples, walnuts, pistachios and a wide range of berries, which are collected and sold.
- ***Honey and medicinal herbs*** are also gathered and sold or consumed locally.
- Some forest enterprises market the seedlings they produce in their ***seed orchards***. This may be quite profitable.
- ***Flower bulbs*** *(Galanthus woronowii and Cyclamen coum)* and ***tree seeds*** *(Abies Nordmanniana)* are exported by Georgia.
- Some forests are also being developed as ***tourist destinations***.
- ***Hunting*** is also important, either for fur and meat, or as trophies, sometimes for foreign tourists, who are prepared to pay large sums for this experience.

Income from the sale of non-wood products and services may play an important role in livelihoods of forest dependent people, although neither this aspect nor the quantity or value of collected products appear to be known or researched yet.

TABLE 8

Main non-wood products and services supplied by forests of the Caucasus and Central Asia

Armenia	Hay, livestock, forest fruits, honey, medicinal products, game
Azerbaijan	Hay, walnuts, berries, chestnuts, hazelnuts, citrus, medicinal plants
Georgia	Fruits, nuts, berries, grazing, hunting, medicinal herbs, flower bulbs, tree seeds
Kazakhstan	Hunting, forest fruits, berries, nuts, mushrooms
Kyrgyzstan	Grazing (meat and dairy), nuts, berries, honey, medicinal herbs
Tajikistan	Hunting, forest fruits, berries, nuts, medicinal plants, honey, seedlings
Turkmenistan	Nuts (pistachio, walnut), berries, fruits, medical herbs, hay, seedlings
Uzbekistan	Honey, grazing, hunting, nuts (pistachio, walnut), medicinal and aromatic plants, fruits, handicrafts

Source: Forests and forest sector overviews in Annex 3.

4.5 Climate change mitigation

All countries in the region have reported to UNFCCC on their greenhouse gas (GHG) balances, including net flows of GHG to or from forest ecosystems. In so doing, they applied the IPCC reporting guidelines to the available data on the forest in their country. The reports suggest that there is a net annual flow of GHG to the forest ecosystems of Caucasus and Central Asia – a carbon sink - of about 25 million tonnes CO_2 equivalent (tCO_2e). Kazakhstan accounts for 11 million tCO_2e, and Azerbaijan and Georgia for over 5 million tCO_2e each. On average, one hectare of forest in the region represents a carbon sink of 1.6 tCO_2e, but this ranges from 0.2 tCO_2e/ha to about 4.75 tCO_2e/ha. It should be pointed out however that these figures can only be as good as the raw data on which they are based, and that forest data in almost all countries in the region are out of date and may be seriously misleading. If that is the case, the carbon sequestration data would also be misleading.

4.6 Employment

Over 40 million people, half the population of the region, live in rural areas, where forestry, with agriculture, is one of the few sources of employment. In many mountain or desert areas, where agriculture is difficult, forestry, with associated grazing and non-wood products, is often the only source of employment and livelihoods. Furthermore, in the Caucasus and Central Asia forestry is a labour-intensive activity as there is little mechanisation, or labour-saving technology, because of lack of capital and skills, as well as the difficult nature of the terrain and poor profitability of forest operations. Data collected by FAO FRA 2015, for employment in forestry, based on national multi-sector employment surveys, show

FIGURE 18

Nursery near Tbilisi, Georgia

Source: UNECE/FAO Forestry and Timber Section, Tbilisi, 2018.

that 34 thousand people (FTE – full time equivalent) are employed in the region as a whole, including 7 thousand FTE in Kazakhstan and 10 thousand FTE for Uzbekistan (reported by the national expert). This represents less than 0.1% of the rural population. Furthermore, an average forest employment figure for the region as a whole of about 2 FTE per 1,000 ha of forest, based on these figures, appears at first sight unreasonably low. There might be several causes,

including weak statistical infrastructure for the employment surveys, non-inclusion of self-employed and forest-related employment (education and training, part time forest workers, environment and tourist guides whose activity is in the forest etc.), and above all the fact that many forestry activities are carried out in an informal or even illegal employment context or as part of a self-employment/subsistence economy, and are thus not reported in official statistics.

To create a realistic picture of forest-related employment, surveys would have to be carried out, addressing the challenges mentioned above. As provision of jobs and livelihoods in rural areas is one of the main justifications for government investment in forestry, such surveys would seem to be essential for evidence-based policy making on forest management in the Caucasus and Central Asia.

4.7 Livelihoods

Forest related revenues are one of the few sources of livelihoods in mostly poor rural areas, where there are few other sources of income. It is not known to what extent the forest managers, whether employed by the State forest services or by quasi autonomous local forest enterprises, generate revenue or livelihoods from the wood or non-wood products and services their forests supply. Most of their income derives from payments from central budgets made to branches of the State forest organisations. In several countries, the salaries of forest rangers are said to be very low indeed. It is clear however that forests do contribute to rural livelihoods, and that more should be known about this contribution, in the Caucasus and Central Asia region, as elsewhere.

5.

LEGAL, POLICY AND INSTITUTIONAL FRAMEWORK

5. Legal, policy and institutional framework

Laws, policies and institutions are the main tools used by societies to achieve their objectives, in this case, sustainable forest management. This section describes the laws, policies and institutions relevant to forests and forest management which are in place in the Caucasus and Central Asia. The starting point was the same for all eight countries, the system in place in the USSR in the 1980s, characterised by public ownership of all forest land, and strong central direction from Moscow, through directives, financial support, and a clear division of labour between the various parts of the USSR. In Caucasus and Central Asia, priority was given to the protection functions, as practically all forests were classified as protective (Group 1). Other parts of the USSR were charged with wood production. Some features of this approach may be detected today, despite the profound social and economic changes over the past quarter century.

The information in this section has been compiled from a variety of sources, cited in the national forests and forest sector overviews, and submitted for checking to the national experts. There have been frequent changes in institutional arrangements in many countries: this description applies to autumn 2018.

5.1 Laws and policies

During the turbulent period after independence, the countries were not able to revise the forest laws inherited from the USSR and there was in most countries an interim period without formal forest legislation in place. However, at present, all eight countries have specific forest laws or forest codes, mostly approved between 1997 and 2003, with two countries finishing the process in 2011. These laws lay down basic principles, notably that all forest land belongs to the State, and define rights and duties of citizens and institutions, tenure rights etc. They are, in the words of Azerbaijan, the top legal framework for forestry.

A policy is necessary to define and coordinate national efforts to move towards sustainable forest management, within the framework provided by the forest law. Normally statements of policy are issued at intervals, sometimes after periods of consultation, for instance in the context of a national forest programme and set out objectives for the sector and the means to achieve them. Preparation of a formal policy statement requires a significant commitment of political will. Furthermore, policies for the forest sector should be coordinated with other policies, such as for environment, agriculture, land use and energy and well addressed/ reflected in the State budget. Five countries in the region have issued a formal statement of forest sector policy in the last fifteen years: Armenia (2005), Azerbaijan (2013), Georgia (2013), Kyrgyzstan (2004, with reassessment in 2015-2017), Tajikistan (2005). In Kazakhstan, a new concept is under development but not yet complete, while in Uzbekistan, a Forestry Code and a Concept for Development of Forestry are under development.

The main thrust of the national policy statements, based on the national forests and forest sector overviews, is very briefly summarised below.

In **Armenia**, the National Forest Program includes a plan of action with deadlines. It covers the period to 2015, but some activities, such as public communication or professional education are continuous and cannot be performed within fixed time boundaries. The National Forest Program includes also other planned activities that were never carried out (for example development of regulation on Licensing for Forest Use, which is envisaged neither in the Forest Code, nor in the Law on Licensing) (ENPI EAST FLEG II, 2016/7). There was a review of the policies and institutions of the forest sector in Armenia in 2016, which generated a number of important conclusions, summarised in the country forests and forest sector overview in Annex 3.

In **Azerbaijan**, the main points of the Action Plan (Government of Azerbaijan, 2013) are:

- **Institutional capacities in forestry** need to be developed and improved including particularly forest inventories, finance and legal framework, forestry cadastre and management plans, monitoring and assessment of forests etc.
- **A communication strategy** is much needed since forests comprise diverse interests of a wide variety of stakeholders.
- In this regard, the **institutional capacity of forestry organization and good governance** in central and field levels should be strengthened and roles and contributions of local administrations for forest protection should be revised and enforced.
- **Human-induced harmful effects on, and damages** to forest resources, in particular illegal logging, over-grazing, recreation and tourism pressures on forested areas should be eliminated through comprehensively prepared measures.
- Expansion of the forested areas through **afforestation and new plantation** is among the major forestry priorities of the Azerbaijan Government as well as the of the Ministry of Ecology and Natural Resources (Government of Azerbaijan, 2013).

In **Georgia**, the National Forest Concept (2014), incorporated into the third National Environment Programme 2017-2021 (2018), is clear in the directions it proposes:

- Develop and implement a **proper institutional set up** for the forest management bodies.
- Forest use: planning of **multi-purpose and efficient forest use** is a precondition for sustainability.
- Forest management **planning procedures** need to be updated and strengthened, including improvement of mechanisms for involving local communities and other stakeholders in the preparation of forest management plans.
- Ensure that forest management is based on up-to-date management plans that reflect current **principles of sustainable forest management**, including improved supervision, and the use of international guidelines as well as certification.
- Restoration **of degraded forests** and afforestation. The first step is to identify degraded areas and where restoration is needed.
- Elaborate and implement a plan for **restoring degraded forest landscapes** to full ecosystem health.
- Increasing the contribution **of timber harvesting and processing** to the national economy, taking into account environmental loads and social demands.
- Preparing an action programme to increase the **added value from wood processing** to the national economy.
- Plantations of **short rotation species.**
- Increasing contribution to the national economy from the exploitation of **non-timber forest products and use of forests by their functional purposes**, taking into account environmental loads and social demands.
- Carrying out a study of the **tourist and recreational** potential of forests and developing and implementing an action plan based on the findings of the study.
- Carrying out a study of the potential for using **the carbon cycle regulation service of forests as a source of income**, for example in the framework of voluntary carbon credits and the REDD+ program.
- **Continuous monitoring of forest resources** is required.
- Design and implement a system to enable policy holders and other stakeholders to continually **monitor the state of, and trends in, forests and the forestry sector.**
- Identifying the **best forms of forest ownership and forest management** based on specific case by case assessment.
- Elaborate and implement activities aimed at **mitigating and adapting to the impacts of climate change on forests.**

In **Kazakhstan**, as of October 2018, a new "concept program for forest sector in economy" is under discussion, but the process is not yet complete.

It is reported that the main lines of the draft forest concept are:

- **Reduce loss of forest area** and increase forest area.
- Develop the forest resource base by strengthening **State support for afforestation and expansion** of the private forest fund.
- Develop **system of protected areas.**
- **More value added and vertical integration** in the wood processing sector.

Targets may include:

- **Preserve** present forest area inside the State Forest Fund.
- **Reduce** areas damaged by pests and diseases by 50% (compared to 2017).
- **Increase area planted** including around settlements by about 280 thousand ha.
- Extension of **privately-owned forests and nurseries**.
- **Reduce imports** of panels by 50% (compared to 2017).

In **Kyrgyzstan**, a new version of the Forest Sector Development Concept up to 2040 was drafted. The new Concept was developed on a "bottom-up" basis, with the active participation of all stakeholders, and contains goals, objectives and strategic directions for the long-term and medium-term vision, as well as an Action Plan for the implementation of the Concept for 2019-2023. The new Concept is based on the country's sustainable development model, so it includes three aspects of sustainability, economic, social and ecological.

For the first time **economic** priorities, which are focused at increasing the potential of forestry to contribute to the development of the country's economy, are viewed independently. Forest resources can act as natural capital, which is considered as a combination of forest resources and ecosystem services.

Considering the importance of the rural population, **social** priorities are aimed at developing joint forest management through rental relations and community forest management.

Environmental priorities are aimed at improving the ecological status of forests, as forests are of great ecological importance, and recognized as the most reliable natural system for preventing the greenhouse effect.

In **Tajikistan**, the national forestry programme lays out specific priorities, which may be summarized as follows:

- Forest management is mostly concerned with the **protective functions** of forests and notably excludes timber extraction.

- Harvesting and processing of **non-timber forest products** is emphasized and explicitly permitted.
- Reference is made to the **new forestry code** that is still pending and its respective by-laws (which are still to be drafted).
- **Leasing contracts with private persons and organizations** are expressly permitted.
- **The State Forest Agency** is named as the agency in charge of forestry nationwide.
- The establishment of some 150 thousand ha of **industrial forest plantations** is envisaged to meet the country's future demand for timber.

However, the NFP was drafted without consideration of the availability of resources, and some of the objectives, such as the goal of 150 thousand ha of industrial forest plantations appear unrealistic as resources were not made available.

In **Turkmenistan**, the principal objectives and trends in the current forest policy, which is mostly based on forest-related legislation, can be summarized as follows:

- Effectively **protecting existing forests**, other wooded land and woody vegetation.
- **Restoring degraded wooded areas** through the use of current silvicultural methods, and protection of biodiversity.
- Planting trees for many different purposes all over the country, with the aim of **extending areas covered by forests**.
- Ensuring that State, commercial, public and other bodies, as well as local authorities, participate in the **organization of and technical support for tree planting**; they are encouraged to take measures to ensure that newly planted trees take root, show good vitality and are properly maintained.
- **Improving methods of operating forest nurseries**, raising quality and productivity in the cultivation of seedlings and saplings, in both nurseries and arboreta.
- **Raising public awareness** and improving **State education and practical training** with regard to sustainable management of forest resources.
- **Promoting forestry-related institutions** and the professional development of their personnel.
- Encouraging the participation of institutions and organizations, particularly those engaged in forestry issues, in the relevant **international programmes and projects** (UNECE, 2012).

In **Uzbekistan**, a Concept for forestry development up to 2030 has been drafted. The main goal of the Concept is determination of the key development priorities for forestry sector. The priorities are focused on:

- Implementation of more efficient and effective measures aimed **at conservation and accelerated reproduction** of forest resources.
- Strengthening **environmental and protective functions** of forests.
- **Resource-saving utilization** of the State Forest Fund lands and forests.
- Development of the corresponding **social aspects of forestry** with consideration of best practices, gained experience.
- **Changing regional and world development environments**.

National forest programmes are also an important policy tool. Armenia, Azerbaijan, Kyrgyzstan and Tajikistan have all developed a national forest programme[4], which has been approved at the policy level. Three of these were completed in 2005/6, so that it should now be possible to monitor progress towards the goals agreed in the NFPs. However, nothing was found comparing progress towards 2018, with the objectives set around 2005. In Georgia, an NFP process was launched as an instrument to involve stakeholders in the decision-making processes in order to support the forestry sector reform.

Finally, to be effective and to attract the necessary political and financial support, forest policy should be integrated into broader national strategies for development (e.g. poverty reduction programmes) and if appropriate into strategies for linked policy areas, notably biodiversity, climate change and energy and related funding. In four countries there are references to forests in the national development strategy (Armenia, Azerbaijan, Kyrgyzstan, Tajikistan). In Georgia, forest issues are included in the Rural Development Strategy, the National Environmental Action Program as well as in National Biodiversity Strategy and Action Plan of Georgia. In Kazakhstan forests are fully covered in the Biodiversity Action Plan, but not included in national priorities.

5.2 Forest sector institutions

A key element in sustainable forest management is the institutional structure of the forest sector. Who formulates policy? On what basis, and with whose participation? How is policy implementation regulated and monitored, and by whom? Who manages state-owned forests? Do these institutions have adequate resources? Are there conflicts of interest, and opportunities for corruption? Do the policies

[4] MCPFE in its Vienna resolution V3 presented this definition: "A national forest programme constitutes a participatory, holistic, inter-sectoral and iterative process of policy planning, implementation, monitoring and evaluation at the national and/or sub-national level in order to proceed towards the further improvement of sustainable forest management as defined in Helsinki Resolution H1, and to contribute to sustainable development." (Forest Europe,2003).

adopted serve the general interest or that of certain groups at the expense of others? It is clearly beyond the scope of this study to explore all these issues in depth, despite their importance, but this section will briefly describe the institutional framework in place in the Caucasus and Central Asia, using a standard approach to present national data. This information has been collected from a variety of sources (cited in the national forests and forest sector overviews) and reviewed by the national experts.

5.2.1 Policy formulation, regulation and monitoring

In four of the countries (Armenia, Azerbaijan, Kyrgyzstan, Turkmenistan), the responsibility for forests lies in the ministry responsible for the environment. In Kazakhstan the ministry responsible for agriculture formulates forest policy. In Georgia, the ministry responsible for forest policy is concerned with both environment and agriculture. In Tajikistan and Uzbekistan, the forest policy body reports directly to the Government. This arrangement reflects the importance in the region of protective functions of forests and of conservation of biodiversity. Since the 1960s, wood production has been given low priority, and final cuts forbidden, as most forests were classified as protective (Group 1).

Implementation and enforcement of policy, as well as monitoring progress, is a separate function from formulation of policy, and from management of publicly owned forests. From the information available, it was sometimes not clear which department is responsible for implementation and regulation. In three countries (Kazakhstan, Kyrgyzstan and Uzbekistan), this function appears to be located in the same department as policy formulation, whereas in Tajikistan, this function seems to be devolved to the local level. In Uzbekistan, the State Committee for Forestry, which reports directly to the Government, is responsible for policy formulation, monitoring and implementation, as well as managing State forests. It was not clear how this function was exercised in Turkmenistan.

It appears therefore that in many countries of the region, but by no means all, the distinction between policy formulation, policy implementation and monitoring, and the management of State forests is blurred, creating the possibility of conflict of interest, and excessive centralisation or top-down management.

5.2.2 Management of publicly owned forests

The agencies responsible for managing publicly owned forests – that is, all forests in the region – probably have the strongest and most direct influence on the condition of the forests. It is thus of interest to review their resources and how they carry out their mission. Annex 2 summarises their main sources of funding, the autonomy of local forest enterprises and whether other forms of tenure have been explored.

Although there is a demand for products or services of the forest, and some potential buyers might be able to pay for these goods and services, few of the enterprises are able to generate revenues from such sales, and local entrepreneurship does not appear to be encouraged – except in the form of illegal or informal arrangements[5]. As a result, it appears that in all countries of the region, the main source of revenue for the State forest enterprises is not the sale of goods and services, but the central budget. However, it appears that, because of the low political profile of forest issues in the region, the sums available are very limited, leaving the enterprises with inadequate equipment and paying very low salaries, and thus unable to attract a skilled workforce.

Another challenge is to manage relations with local communities who are the main consumers/clients of the goods and services provided by the forest (fuelwood, grazing, fruits, nuts), and sometimes the driving force behind illegal or informal supply of these goods and services. Ideally, local communities and forest managers would work together to manage the forests to produce the desired goods and services, in an efficient manner, ensuring that each actor is correctly compensated for his contribution. In a centralised system however, marked by widespread rural poverty, the top-down approach inherited from the Soviet system does not always lead to satisfactory solutions. In four countries (Armenia, Azerbaijan, Georgia, Turkmenistan), the local forest enterprises are reported as being directed from the centre with little scope for local autonomy, while in Kazakhstan, Kyrgyzstan and Tajikistan, local authorities appear to have a say in forest management. In Kazakhstan, 78% of forest area is managed by local authorities (akimats).

All forest in the region is publicly owned. In some countries, this is laid down in the constitution. The most common form of tenure is that local forest enterprises, under the direction or oversight of a central agency, own and manage forest land, as laid down by policy. However, other types of tenure have been introduced or discussed, including leasing (for instance in Georgia, Kyrgyzstan or Uzbekistan) and community-based forest management (pilots in Kazakhstan and Kyrgyzstan). In Kazakhstan a Private Forest Fund exists alongside the State Forest Fund, intended for artificial forests and plantations. It owns a small area of non-forest land but has no forests yet.

5.3 State forest fund, forest and other wooded land

An important institution in all the countries of the region is the state forest fund. There are sometimes misunderstandings about the nature and definition of the state forest fund, and

[5] The fact that corruption takes place proves that there is effective demand for wood and other goods and services, which the enterprise is unable to satisfy in a legal fashion. Revenue is thus diverted from the forest enterprise to the corrupt officials, further weakening the institution, and the rule of law.

such terms as forest land, land with forest cover etc. This section explores and clarifies the situation with regard to the state forest fund in the region.

In all the countries in the Caucasus and Central Asia, there is a state forest fund, which is a legally defined area of land, managed by the forest authorities, and usually with a special status, including limitations on use. In fact, the concept of a state forest fund is not only a definition of land use or land ownership, but a complete concept of land management, with approaches and methods developed over many decades. However, much of the area of the state forest fund does not have tree cover. This area without forest cover includes forest related land, such as buildings and seed orchards necessary for forestry, or land in the process of regeneration or afforestation, but also many millions of hectares which are not used directly for forestry, and have no tree cover, such as infertile land, grazing land, or arable land. Likewise, there are sometimes forests or trees outside the state forest fund, which are under different management regimes, even if owned by the State. For instance, a recent remote sensing-based inventory in Kyrgyzstan "discovered" 700,000 ha of forest (international definition) outside the State Forest Fund.

However, at an international level, where comparability and objective measurement are essential, a different approach has been agreed after many years of negotiation involving all countries in the world, in the context of the FAO Forest Resources Assessment. The international definition is now accepted by the UN Forum on Forests, Forest Europe and many other forest related bodies, and widely used in international forest studies. The international definition is based on a measurable parameter, the presence or absence of trees. The full definition is in Annex 1. Thus, the spatial coverage of "forest" as defined internationally, and the area of the state forest fund overlap but are by no means identical: most but not all "forest" is located inside the territory of the state forest funds: there is "forest" outside the state forest fund, and much of the state forest fund land is not covered by "forest".

There is a spectrum of tree cover from 0% to 100%, and any limit is bound to be arbitrary. The limit agreed for the international definition is 10% tree cover. Furthermore, a tree has to meet the criteria of the FAO definition, and be able to reach at least 5 m at maturity in situ. However, it is recognised that there are several ecosystems with less than 10% tree cover which have some of the characteristics associated with forests. The saxaul ecosystems of Central Asia are a good example of this type of ecosystem. To cover this aspect, there is an international definition of "other wooded land", with tree cover between 5% and bush cover above 10%, which will usually include saxaul ecosystems.

In reporting to FRA, and other processes, countries are requested to convert their national statistics, based on national definitions, to the international definitions. This conversion has to be carried out by all countries. The present study uses the concept of "forest" and "other wooded land" according to the international definitions, while recognising that the data will not be the same as those used in national publications. In particular the data for "forest" only include those parts of the state forest fund which have at least 10% tree cover. They also include data for land with over 10% tree cover outside the state forest fund.

Table 9 presents, for the record, and to reduce misunderstandings, the area in each country of the state forest fund, and of "forest" and "other wooded land", according to the international definitions.

TABLE 9

Forest and State forest fund in the Caucasus and Central Asia

	State forest fund	*Forest*	*Other wooded land*	*Forest and other wooded land (FOWL)*	*FOWL as % of State forest fund*
	1,000 ha	1,000 ha	1,000 ha	1,000 ha	%
Armenia	460	332	63	395	85.9
Azerbaijan	1,214	1,139	0	1,139	93.9
Georgia	3,005	2,822	6.9	2,829	94.1
Kazakhstan	29,700	3,397	9,507	12,904	43.4
Kyrgyzstan	3,474	1,252	411	1,663	47.9
Tajikistan	1,800	421	142	563	31.3
Turkmenistan	9,764	4,264	0	4,264	43.7
Uzbekistan	11,300	3,254	115	3,369	29.8

Note: For Kyrgyzstan includes also protected areas.

Source: Forests and forest sector overviews in Annex 3.

In general, forests and other wooded land account for a greater share of the state forest fund in the Caucasus (range from 86% to 94%) than in Central Asia (range from 30% to 48%). Table 10 brings together available information on state forest organisations, the area they manage and their workforce.

TABLE 10

State forest organisations (SFO): area managed and workforce

Country	*State forest organisation*	*Area managed by SFO*		*Employees of SFO*			*Area managed by SFO as % of State forest fund*	*SFO employees per 1,000 ha managed by SFO*	*Comments*
		Total	of which: Forest	Total	Central	Regional			
		1,000 ha		Number			%	Number	
Armenia	Hyantar	342	277	920	52	868	74.3	2.7	
Azerbaijan	Forestry development service at the Ministry of Ecology and Natural Resources (FDS)	1,214	1,139	2,000	-	-	100	1.6	*Assumed that all employees in forestry work for FDS*
Georgia	National Forest Agency (NFA)	1,800		988	128	860	63	0.5	
Kazakhstan	Akimats (local forest enterprises, answering to local authorities) + Committee on Forestry and Wildlife (CFW)	29,700	3,397	11,000	-	-	100	0.4	*Akimats (counties) manage 78% of SFF and CFW 21% ("others" 1%)*
Kyrgyzstan	State Agency Environment Protection and Forestry + *Leskhoz* + *natural parks+reserves* at local level	3,474	858	1,900	70	1,830	100	0.6	*Forests outside the SFF not taken into consideration*
Tajikistan	District forest enterprises (*leskhoz*)	1,800	421	1,384	41	1,343	100	0.8	*Only permanent employees. Total including seasonal workers is 4,000*
Turkmenistan	Department of Forestry	9,764	4,264	1,500	100	1,400	100	0.2	
Uzbekistan	State Committee on Forestry (Goskomles)	11,300	3,254	8,482	-	-	100	0.7	

Source: Forests and forest sector overviews in Annex 3.

6.

FOREST DEGRADATION AND FOREST LANDSCAPE RESTORATION

6. Forest degradation and forest landscape restoration

The pressures described above have degraded or even destroyed the forests of the region, in many different ways, and to different extents. It is not possible at present to quantify or map this damage, degradation and deforestation, because of the lack of recent inventories, and for methodological reasons, notably the lack of an agreed practicable standard definition of "degraded forest"[6]. Nevertheless, the national experts for this study were asked to provide an estimate of the types of forest degradation in their country and the policy response. These estimates are summarised below.

FIGURE 19

Forest fire, Armenia

Source: Presentation, R. Petrosyan, Tbilisi, 2018.

As one response to this situation, which occurs all over the world, many stakeholders and governments are committed to forest landscape restoration. In particular, the Bonn Challenge is "a global effort to bring 150 million ha of deforested and degraded land into restoration by 2020 and 350 million ha by 2030. It is an implementation vehicle for national priorities such as water and food security and rural development while contributing to the achievement of international climate change, biodiversity and land degradation commitments. The Bonn Challenge was launched in 2011 by the Government of Germany and IUCN, and later endorsed and extended by the New York Declaration on Forests at the 2014 UN Climate Summit. IUCN is the Secretariat of the Challenge." (IUCN, 2018).

According to the Bonn Challenge website[7], "Forest landscape restoration (FLR) is the ongoing process of regaining ecological functionality and enhancing human well-being across deforested or degraded forest landscapes. FLR is more than just planting trees – it is restoring a whole landscape to meet present and future needs and to offer multiple benefits and land uses over time. FLR manifests through different processes such as: new tree plantings, managed natural regeneration, agroforestry, or improved land management to accommodate a mosaic of land uses, including agriculture, protected wildlife reserves, managed plantations, riverside plantings and more." (IUCN, 2018).

FIGURE 20

Afforestation, Armenia

Source: Presentation, R. Petrosyan, Tbilisi, 2018.

Until recently the Bonn Challenge has focused on tropical regions, where deforestation and forest degradation are most severe, but in 2018, seven governments of the Caucasus and Central Asia met in the Ministerial Roundtable on Forest Landscape Restoration in the Caucasus and Central Asia (Astana, 21-22 June 2018). They passed the Astana resolution, wherein they committed to identify degraded lands, work to restore and afforest them by 2030, assess the national potential for forest landscape restoration, reinforce regional cooperation on forest landscape restoration, call on development partners to support efforts and investment in forest landscape restoration, facilitate access to external investment opportunities, cooperate among interested partners and periodically assess the efforts in order to voluntarily monitor and report progress towards forest landscape restoration targets in the Caucasus and Central Asia. A study on Forest Landscape Restoration in the Caucasus and Central Asia, focusing primarily on the period from the collapse of the Soviet Union until the present day, identified

[6] This topic has been frequently discussed at the global level, notably in the context of the FAO FRA and the Global Core Set of forest related indicators, especially as there are commitments with respect to forest degradation in the United Nations Strategic Plan for Forests. However, so far, no workable solution has been found at the global level.

[7] Bonn Challenge website: http://www.bonnchallenge.org/content/challenge

the key drivers of forest degradation and the potential for forest landscape restoration in the Caucasus and Central Asia. The study was undertaken to support the preparation of restoration pledges in the run up to the Ministerial Roundtable (UNECE/FAO, 2019).

Six governments made specific commitments on forest landscape restoration, as summarised in Table 11.

At present, no further information is officially available on the form the implementation of these commitments will take. Preparatory work is just starting. However, for the purposes of the broad picture which this study aims to achieve, national experts were asked to estimate:

- The types of forest degradation which exist in their country and the main drivers of degradation for each type.
- What action could be taken to restore degraded forests, assuming sufficient resources and political will.
- What actions are being undertaken or planned for the near future.

Table 12 summarises those results which had been received by mid-December 2018. For some countries the response was structured by forest type, for others by type of pressure. Experts were asked to estimate the areas concerned, but, so far, none have been in a position to do so, as no specific studies have been carried out.

TABLE 11

National commitments announced at the Ministerial Roundtable on Forest Landscape Restoration and the Bonn Challenge in the Caucasus and Central Asia

Armenia	260,000 ha by 2030 (since the Conference, the Armenian government has announced it will review and adjust this commitment)
Azerbaijan	To be determined
Georgia	1,500 ha by 2030 Subject to support: Assist natural regeneration of forests on 7,500 ha by 2030
Kazakhstan	1,500,000 ha by 2030 Subject to support: additional 300,000 ha by 2030
Kyrgyzstan	Forest Landscape Restoration on 23,200 ha by 2030 Subject to support: Restoration of 300,000 ha of degraded pasture land by 2030
Tajikistan	66,000 ha by 2030
Uzbekistan	500,000 ha by 2030 Subject to support: additional 500,000 ha by 2030
Total pledged by the region: 2,658,200 ha Total pledged by the region including restoration subject to additional support: 3,458,200 ha	

Source: Report from the Ministerial Roundtable on Forest Landscape Restoration and the Bonn Challenge (22 June 2018) Joint UNECE/FAO Forestry and Timber Section, 2018.

TABLE 12

Main types of forest degradation in countries of the Caucasus and Central Asia, and policy responses 2018

Forest Type / Factor	*Occurring in:*	*Main drivers/degradation types*	*Policy response*
Desert forests including saxaul	Turkmenistan, Uzbekistan.	Fuelwood demand, aggravated by energy shortage in rural areas, leading to **overcutting, overgrazing, land transfer to agriculture** (in the past). Uneven water supply in pasture areas, and drought, leading to concentration of animals.	Inventory of degradation, and situation of pasture. Strengthen protection to prevent overcutting and overgrazing. Extend silviculture on eroded slopes, promote natural restoration.
Mountain forests	Armenia, Georgia, Kyrgyzstan, Turkmenistan, Tajikistan, Uzbekistan.	Intense illegal logging for fuel, leading to erosion, with overgrazing, leading to **decreases in productivity and in natural regeneration**. Lack of irrigation water has pushed local populations to increase animal numbers. **Weakened regeneration**.	Anti-erosion planting increased natural regeneration. Supply of gas to rural communities. Water saving, enabling reduction in animal numbers. Supply of appropriate seedlings for regeneration.
Floodplain forests (tugai)	Kazakhstan, Tajikistan, Uzbekistan.	**Water scarcity, salinization** and changes in the hydrological regime of the rivers. Unsustainable use of forest resources by local people for fuel and grazing.	Strengthen protection against overcutting and overgrazing. Creation of anti-erosion plantations.
Fuelwood harvesting	Armenia, Azerbaijan, Georgia, Kazakhstan (mainly in saxaul areas), Kyrgyzstan, Tajikistan.	Strong energy demand, leading to **overcutting, erosion, soil loss, reduction of forest cover**. Insufficient energy supply for rural communities.	Supply alternative fuels, supply wood from sanitation fellings for rural energy, strengthen forest police functions, heavy fines, coordination with local communities, increased resources for forest managers. Improve forest inventory. Increase price of wood.
Overgrazing	Azerbaijan, Armenia, Tajikistan, Kazakhstan (mainly in saxaul areas), Kyrgyzstan.	Grazing pressure causes species change, **loss of productivity, erosion, pasture degradation and failed regeneration**. Lack of pasture land. Excessive number of animals for available pasture.	Observe grazing standards, fertilise, crop rotation, agreement with herders, better monitoring, increased resources for forest managers. Strengthening forest conservation and the transition to closed pasture systems. Improving the forest landscapes and the creation of agroforestry systems.
Overharvesting of valuable species (walnuts, pistachios)	Kyrgyzstan, Tajikistan.	Harvesting of all hazelnuts **hinders regeneration**, leads to degradation.	Close monitoring during harvest time, make agreements on harvest volumes, leaving 30% of hazelnuts for wildlife and regeneration, providing more resources for forest managers to improve enforcement of regulations.

Source: Forests and forest sector overviews in Annex 3.

BOX 1

The case of the Aral Sea

The Aral Sea was the destination of the two great rivers arising in the mountains of Central Asia, the Amur Darya and the Syr Darya. In the 1960s, the area of the Aral Sea was 68,000 km^2, but by 2004, this had shrunk to 17,160 km^2, due to excessive extraction of water from the rivers, mostly for irrigation, of cotton and wheat, with considerable water losses throughout the system. The two rivers no longer reach the Aral Sea. The reduction of water area has created a salty desert, with windblown toxic (salt, heavy metals) dust, damage to health and environment, as well as the collapse of the fishing industry of the Aral Sea.

There has been national, regional and international concern, and efforts to alleviate the damage, by reducing water wastage, limiting dust storms through vegetation, and hydraulic engineering, notably the Kokarel dam, which keeps water in the remnant North Aral Sea, and has had some success in increasing depth, reducing salinity and enabling some fishing. These efforts have been slowed by tensions between countries in the region because of diverging interests, for instance between upstream and downstream countries. One approach is to establish saxaul vegetation, which is resistant to drought and saline environments, on the former seabed, to reduce dust storms and slow desertification. UNEP reports that half a million hectares of saxaul have been established on the Aral seabed in Uzbekistan (UN Environment, 2018).

Despite efforts over many decades, the Aral Sea remains one of the major environmental, social and economic challenges in the world, influencing millions of hectares of Central Asia.

FIGURE 21

The Aral Sea in 2000 (left) and 2018 (right)

Source: (NASA, 2018).

7.

CONCLUSIONS

7. Conclusions[8]

The complex reality of the situation as regards the forests of the Caucasus and Central Asia, described in the earlier chapters and the country forests and forest sector overviews, may be summarised as follows:

- The forests of the region play an essential role in protecting the environment against erosion and desertification, in conserving biodiversity, and in providing livelihoods to rural people. They are also the main supplier of energy for heating and cooking in many poor, rural areas.
- The forests of the region are under severe pressure, notably from demand for fuelwood, and for grazing, leading to high levels of informal and illegal wood harvesting, and to forest degradation.
- Despite some shortcomings, a formal legal framework is in place in most countries. Most countries have prepared formal statements of their forest sector policy, which are summarised in the study.
- Information on the status and trends for the forest resource, its main contributions to sustainable development, and the main pressures on the forests is not adequate in most countries: as a result, policy making is not based on robust evidence, and there is little objective monitoring of progress towards stated policy goals.
- In all countries of the region, all forest is publicly owned. However, there are differences between countries in the institutional framework in place. The State forest organisations and their decentralised agencies (*leskhoz*) play the key role in implementing forest management, sometimes in cooperation with local authorities. The balance between centralised and decentralised decision making varies widely between countries.
- Most forest management activities are financed from the central budget, although in some cases there is also income from the sale of goods (wood and non-wood products) and services (such as grazing).
- One of the constant themes is the inadequacy of the resources available to forest institutions, whether financial, human or of skills. There are often too few forest rangers, ill equipped, using weak databases, and with insufficient resources to carry out the tasks allotted to them.
- Many of the workers in the forest sector lack the necessary skills and educational background.

[8] These conclusions are based on the author's analysis, but incorporate the comments made by the workshop participants during and after the workshop (Regional Workshop to review the draft publication "State of Forests of the Caucasus and Central Asia",Tbilisi, Georgia, 3-5 December 2018).

The main challenges for the forest sector of the Caucasus and Central Asia, as they emerge from this study and the country forests and forest sector overviews, are:

- To maintain and restore existing forests, reducing illegal logging and overgrazing, notably by:
  - Reducing pressure from fuelwood demand by supplying alternative energies, such as gas, at affordable prices to rural communities, and by using energy more efficiently.
  - Cooperating with rural communities and other stakeholders to manage grazing and keep grazing pressure at sustainable/bearable levels, ensuring efficient use of grazing resources and, if necessary and possible, reducing animal numbers.
  - Providing sufficient authority and resources to local forest management units so that they can perform their tasks of managing forests and preventing illegal logging.
  - Establishing, or re-establishing, protection forests in threatened ecosystems, in mountains, deserts or saline areas.
- To increase the benefits provided by forests to society, for instance by:
  - Expanding forest area, for instance in agricultural areas as shelterbelts and/or fuelwood plantations.
  - Developing revenues from services supplied by forests, such as recreation and tourism, carbon sequestration, and supply of non-wood products, as supplementary contributions to rural livelihoods.
  - Ensuring that beneficiaries of forest services participate in financing the management and provisions of these services.
  - Investing revenues generated by forest districts in forests, thus increasing incentives for active and sustainable management, and providing some of the necessary resources for the progress towards sustainable forest management.
- To improve the information base for sustainable forest management, by implementing comprehensive and accurate forest inventories, repeated at regular intervals, as well as surveys of forest health and vitality, monitoring supply of wood, other goods and services, as well as employment and livelihoods in the forest sector.
- To ensure that the information collected is taken into account in the policymaking process and used to monitor progress towards stated goals.
- To identify and apply best practice in forest management.

- To ensure planning is done on an intersectoral basis and improve coordination of the various agencies with activities relevant to forests.
- To develop strategies for progress towards sustainable forest management and implement them fully.
- To decentralise, to the extent possible, decision making in the forest sector.
- To provide adequate education and training to all those active in the forest sector, after a comprehensive assessment of the needs as regards skills.
- To improve social protection and provide decent working and financial conditions for forest workers; through this, to improve the attractiveness and prestige of forest professions.
- To strengthen forest sector institutions, by allocating sufficient resources (financial, technical and human) from the central budget to achieve the stated policy objectives, as well as removing bureaucratic structures and processes, while maintaining sufficient monitoring and responsibility.
- To integrate sustainable forest management into national development and poverty reduction strategies, thus promoting the allocation of sufficient resources to sustainable forest management.
- To improve communication on forest issues, with policy makers and the public, using the best available information and communication techniques, to develop their understanding of forest-related issues and support for sustainable forest management.
- To improve organization and coordination of international aid projects, avoiding their duplication and fragmentation while supporting their complementarity and coherence with national strategies, and to ensure the durability of actions/results generated through these projects.

8.

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ANNEXES

ANNEX 1:

INTERNATIONAL FOREST DEFINITIONS AS IN FRA 2020

FOREST

Land spanning more than 0.5 ha with trees higher than 5 meters and a canopy cover of more than 10 percent, or trees able to reach these thresholds in situ. It does not include land that is predominantly under agricultural or urban land use.

Explanatory notes

1. Forest is determined both by the presence of trees and the absence of other predominant land uses. The trees should be able to reach a minimum height of 5 meters in situ.
2. Includes areas with young trees that have not yet reached but which are expected to reach a canopy cover of 10 percent and tree height of 5 meters. It also includes areas that are temporarily unstocked due to clear-cutting as part of a forest management practice or natural disasters, and which are expected to be regenerated within 5 years. Local conditions may, in exceptional cases, justify that a longer time frame is used.
3. Includes forest roads, firebreaks and other small open areas; forest in national parks, nature reserves and other protected areas such as those of specific environmental, scientific, historical, cultural or spiritual interest.
4. Includes windbreaks, shelterbelts and corridors of trees with an area of more than 0.5 ha and width of more than 20 meters.
5. Includes abandoned shifting cultivation land with a regeneration of trees that have, or are expected to reach, a canopy cover of 10 percent and tree height of 5 meters.
6. Includes areas with mangroves in tidal zones, regardless whether this area is classified as land area or not.
7. Includes rubber-wood, cork oak and Christmas tree plantations.
8. Includes areas with bamboo and palms provided that land use, height and canopy cover criteria are met.
9. Includes areas outside the legally designated forest land which meet the definition of "forest".
10. Excludes tree stands in agricultural production systems, such as fruit tree plantations, oil palm plantations, olive orchards and agroforestry systems when crops are grown under tree cover. Note: Some agroforestry systems such as the "Taungya" system where crops are grown only during the first years of the forest rotation should be classified as forest.

OTHER WOODED LAND

Land not classified as "Forest", spanning more than 0.5 ha; with trees higher than 5 meters and a canopy cover of 5-10 percent, or trees able to reach these thresholds in situ; or with a combined cover of shrubs, bushes and trees above 10 percent. It does not include land that is predominantly under agricultural or urban land use.

Explanatory notes

The definition above has two options:

- The canopy cover of trees is between 5 and 10 percent; trees should be higher than 5 meters or able to reach 5 meters in situ. OR
- The canopy cover of trees is less than 5 percent, but the combined cover of shrubs, bushes and trees is more than 10 percent. Includes areas of shrubs and bushes where no trees are present. - Includes areas with trees that will not reach a height of 5 meters in situ and with a canopy cover of 10 percent or more, e.g. some alpine tree vegetation types, arid zone mangroves, etc.

ANNEX 2:

FOREST SECTOR INSTITUTIONS

ANNEX TABLE 1:

Structure of policy formulation and implementation in forest sector.

	Responsibility for policy formulation	Enforcement of policy, monitoring
Armenia	Department of Forest Policy and Biodiversity, Ministry of Nature Protection of the Republic of Armenia..	Ministry of Nature Protection, Forestry Committee (55 employees).
Azerbaijan	Ministry of Ecology and Natural Resources of Azerbaijan (MENR).	Ministry of Ecology and Natural Resources of Azerbaijan (MENR).
Georgia	Ministry of Environmental Protection and Agriculture of Georgia.	Department of environmental supervision.
Kazakhstan	Ministry of Agriculture of Republic of Kazakhstan.	Committee on Forestry and Wildlife (in Ministry of Agriculture).
Kyrgyzstan	State Agency for Environmental Protection and Forestry (SAEPF).	Department of Forest Ecosystems Development, under SAEPF. However, The SAEPF lacks sufficient resources to carry out hands-on oversight of its subordinate entities or to develop policy, leaving substantial discretion to *leskhoz*. The separation of productive and regulatory functions in forestry management has not been implemented.
Tajikistan	The State Forestry Agency which is directly under the Government of Tajikistan has overall responsibility for Tajikistan's state forest resources.	District forest enterprises (*leskhoz*), under the Forestry Agency.
Turkmenistan	Majlis (Parliament) of Turkmenistan, Cabinet of Ministers of Turkmenistan, Ministry of Agriculture and Environment Protection of Turkmenistan (previously State Committee of Turkmenistan for Environmental Protection and Land Resources).	Ministry of Agriculture and Environment Protection of Turkmenistan and its Service for Forest Seeding and the Protection of Natural Parks.
Uzbekistan	State Committee of the Republic of Uzbekistan on Forestry (Goskomles).	State Committee of the Republic of Uzbekistan on Forestry (Goskomles).

Source: Forests and forest sector overviews in Annex 3.

Agency responsible for managing state forest fund	Other agencies who manage publicly owned forests
Hyantar SNCO (State Non-Commercial Organisation) manages 342.4 thousand ha of which 277.1 forest.	Bioresources Management Agency, Ministry of Nature Protection.
Forestry development service (FDS) at the Ministry of Ecology and Natural Resources (*previously Forestry Development Department - FDD*).	Department of Biodiversity and Protected Natural Areas and Ministry of Culture and Tourism (MCT) have responsibilities concerning forests but are apparently not directly involved in management. Local communities and municipalities are not involved in the management of forests.
National Forestry Agency (NFA): 1.8 million ha.	267,000 ha under the Agency for Protected Areas. 150,000 ha under the Forestry Agency of the Autonomous Republic of Adjara. 5,000 ha managed by the Municipality of Akhmeta in the Tusheti protected landscape. About 433,517 ha are in the Autonomous Republic of Abkhazia and South Osetia out of the control of the Government of Georgia.
Local authorities (akimats) 78%, Committee on Forestry and Wildlife 21% (mostly specially protected natural areas), "other" 1%.	1% "other agencies".
Leskhoz at local level, with oversight from Department of Forest Ecosystems Development.	700 thousand ha of forest outside the Forest Fund has not yet been transferred to any state organization, but now activities on national forest management inventory have been carried out, and the Government of Kyrgyz Republic will decide the issue of transferring management to any organization. This may be municipal organizations.
District forest enterprises (*leskhoz*). District-level *leskhoz*, responsible for forest management and protection, operate on state-owned land that has been assigned to them. The *leskhoz* are the technical authorities that have sovereign functions (e.g. enforcement of the Forest Law), while at the same time, they must manage forests in Tajikistan (and act as entrepreneurs).	Two institutions also manage state-owned forests: State Administration of Protected Areas; Scientific Research Institute of Forestry (together with the Academy of Sciences).
Department of Forestry, Service for forestry and natural park protection.	Many ministries and departments are involved in the implementation of the National Forest Programme, some of them have set up forest enterprises for the creation of forest plantations. However, they are not involved in forest management.
State Committee of the Republic of Uzbekistan on Forestry (Goskomles).	State Committee for Nature Protection (SCNP), Tashkent Province Khokimiyat (Mayor) .

ANNEX TABLE 2:

Management of publicly owned forests

	Manager of state forest fund	Main sources of income
Armenia	Forestry Committee, Hyantar SNCO (State Non-Commercial Organisation).	Sources of funding for Hyantar SNCO are State budget, and own revenues (timber sales, forest land rent, etc.), as well as international donors.
Azerbaijan	Forestry development service (FDS) at the Ministry of Ecology and Natural Resources).	The financial support of department's activity is realized from the budget of Azerbaijan Republic as well as from other sources provided in the legislation.
Georgia	National Forestry Agency (NFA).	NFA has several sources of income, revenues from: compensation fees, issuing timber logging tickets, placement of communication facilities. Since 2017, there has been income from supply of fuelwood to public institutions.
Kazakhstan	Local authorities (akimats), Committee on Forestry and Wildlife, "other".	The Forest Code recognised the following sources of funding for forest management in the SFF: state budget, revenue from paid services, forest users, voluntary contributions and "other". However, the state budget is the most important.
Kyrgyzstan	*Leskhoz* at local level, with oversight from Division of Forest Ecosystems.	The total annual budget for salaries and all other operational costs of the SAEPF and its subordinate agencies and park management currently stands at approximately US$4 million. *Leskhoz* budgets are funded by income from lease arrangements as well as by grant allocations from environmental user fees that are pooled at territorial levels.
Tajikistan	District forest enterprises (*leskhoz*), under the Forestry Agency.	Central budget, supply of non-wood products, for instance livestock, horticultural products, beekeeping, agricultural products.
Turkmenistan	Department of Forestry, Service for forestry and natural park protection.	Central budget, as well as enterprise related income.
Uzbekistan	State Committee of the Republic of Uzbekistan on Forestry (Goskomles).	The financial support of forestry activity is realized from the budget of Republic of Uzbekistan as well as from other sources provided for in the legislation and from the Forestry Development Fund. According to the Regulations part of the income from supply of non-wood products, for instance livestock, horticultural products, beekeeping, agricultural products and services will be transferred to the Forestry Development Fund.

Source: Forests and forest sector overviews in Annex 3.

Autonomy of local forest management enterprises	Other tenure forms
Local branches (19) have legal identity, but all decisions are taken centrally.	Other forms of ownership are legally defined, but they are not yet applied in practice.
The local enterprises are part of the FDS. "The (forest research) Institute together with the Department of Forest Development introduces the recommendations to subordinate enterprises (forest enterprises and nurseries). All controls for the process of introduction to the production should accordingly be done by the sectors of the Forest Development Departments." (Government of Azerbaijan, 2013).	There is no opportunity for representatives of the private sector or local communities to participate in management of forests. The draft of the national forest program enables physical and legal persons to participate in the management of forest resources, but also shows that all forest fund land is owned by the state, and public participation in forest management is not an issue of public debate.
Regional agencies managed directly from Tbilisi.	Long term licences have been given, but this practice has ceased. However, final cuts may only be carried out by licensees. About 30 licences are still valid.
Forests under "long-term use" contracts are managed by enterprises (private) chosen through tender and paid from the national budget. They must follow the rules laid down by the Committee.	Private Forest Fund exists, intended for artificial forests and plantations, but has no forests yet. Possibility of community-based management under consideration, pilot study proposed.
The *leskhoz* should implement the centrally prepared management plans, but in practice, they do what they can with the (very limited) resources available to them.	A model of community-based forestry management has been developed with substantial donor support and is set forth in government regulations; however, the governance and de facto management arrangements under this approach essentially involve a form of leasing to individual households, with responsibility for planning and oversight of the forest as a whole retained by the same *leskhoz* management that is charged with forest preservation.
The *leskhoz* (forestry enterprise) receives requests for annual quotas for fuelwood harvesting for schools, hospitals, the army and other public institutions. It also receives a reforestation plan. The Agency allocates very few financial resources to the *leskhoz*. The *leskhoz* are controlled by the Forestry Agency under the Government of the Republic of Tajikistan.	Not observed.
Activities on the ground are implemented under the Department of Forestry's supervision.	The Society for the Protection of Nature of Turkmenistan and a number of other public organizations participate in charity campaigns on afforestation.
Situation unclear.	Lands of the State Forest Fund can be given for use (permanent or temporary) to legal and private entities. Permanent forest users are forestry enterprises, establishments and organizations, which are provided with lands of the State Forest Fund under a permanent tenure agreement. Temporary forest use can be short-term (i.e. up to 3 years), or long-term (i.e. up to 10 years).

ANNEX 3:

FORESTS AND FOREST SECTOR OVERVIEWS

The forests and forest sector overview have been prepared by the author, in close cooperation with the national experts, according to a standard format, covering context, trends for the forest resource, goods and services provided by the forest, forest products markets and trade, policies and institutions, major challenges for the forest sector and the direction of forest sector policy. There is also in each overview an Annex on state forest related institutions.

These overviews, as agreed with the national experts, are presented below in alphabetical order of countries.

Because of the data quality problems described in the study, these data should not be used for detailed analysis or for inter-country comparisons.

ANNEX 3.1 FORESTS AND FOREST SECTOR OVERVIEW: ARMENIA

By Kit Prins and Ruben Petrosyan

CONTEXT

Armenia is a landlocked mountainous country in the south Caucasus, with a population of 3 million people, more than a third of whom live in rural areas.

ANNEX FIGURE 1:

Map of Armenia.

Source: United Nations Geospatial Information Section, 2013.

ANNEX TABLE 3:

Armenia in context, around 2015

Total area (incl. water)	Million ha	3
Population	Million	3
Share of rural residents	%	36.4
GDP/person	$	3,937
Share of population living in extreme poverty (<1.90$/day)	%	2.3
Forest cover	%	11.1
Forest per inhabitant	ha	0.11

Source: FAO 2015, World Bank 2017, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Armenia is classified as "middle income" by the World Bank, with GDP/head of just under $4,000. Over 2% of the population are reported as living in extreme poverty, defined as less than $1.90/day.

According to available data, about 11% of the country has forest cover, and there is 0.1 ha of forest for each resident, one of the lowest ratios in the region.

At present, the official forest management plans have reached their end date and there is an urgent need to develop and approve new plans. However, it is envisaged that by 2019-2020, forest management plans for all forest enterprises and complete forest resource data will be available.

Taking the longer historical view, "damage to Armenia's forest resources has been severe since the 1930s, when industrialization and collectivization got under way. Extensive forest clearing caused soil erosion and forest degradation has continued in recent years. Forest areas close to population centres became the main source of fuelwood during the winters of 1991-1993 (about 50 per cent of household energy)" (UNECE, 2000).

Growing stock is estimated at 125 m^3/ha. About 5% of forests are considered "primary forests" and 6.6% plantations for wood production.

All forest is publicly owned, and over 80% of it is managed by the state forest enterprise Hyantar, and the rest by the Ministry for Nature Protection (Galstyan, 2016). All forest is considered to have a long-term management plan, but in most cases, they have reached their end date, and have not been renewed, so that they are no longer valid. About 4% of forest is reported as disturbed, by fire or insects and disease.

No forest management unit is certified by PEFC or FSC, and no forestry standard for certification has been prepared for Armenia.

ANNEX TABLE 4:

Trends for the forest resource, Armenia

		1988	Most recent
Area of forest	1,000 ha	329.4	332.3
Area of other wooded land	1,000 ha		63
Forest and other wooded land	1,000 ha	329.4	395.3
Average annual % change in forest area	%	-	0.02
Growing stock	Million m^3	38.9	41.7
Share of primary forest	%	-	5.1
Share of plantations for wood production	%	-	6.6
Share of publicly owned forest	%	100	100
Share of public forest managed by state forest agency/ enterprise	%	88.5	83.5
Proportion of forest area under a long-term forest management plan	%	-	89
Area of certified forest	Ha	0	0
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	-	3.7

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on the forest resource: The first priority must be to have a reliable, up-to-date forest inventory and management plans as a basis for policy formulation, as well as fulfilling Armenia's commitments as regards reporting on SDGs and the United Nations Strategic Plan for Forests. There was a remote sensing survey in 2011 and forest management plans are under review, to be completed by 2020.

ANNEX FIGURE 2:

Quarry in the Caucasus Mountains

Source: Presentation, R. Petrosyan, Tbilisi, 2018.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

Recorded removals by Hyantar were 33,000 m^3. In addition, Hyantar distributed, free of charge, 68,000 stacked cubic metres of deadwood. However, these do not include illegally felled material, which is very hard to estimate, which is almost all for energy use. Strong demand is driven by the high price of alternative fuels, notably gas, in rural areas, leaving poor rural families with no alternative to unrecorded/illegal fuelwood removal. It is estimated that total removals in Armenia are around 535 thousand m^3. According to FRA 2015 fellings exceed annual allowable cut by ten times, a clearly unsustainable position.

A third of the forest area is conserved for protection of biodiversity in the Armenian protected area system ("forest landscape on protected areas") (Galstyan, 2016). More than two thirds are managed for its protection functions, although different terminology is used by the Forest Code of 2005 (Kocharyan, 2005).

Armenian forests supply a wide range of non-wood forest products which are significant sources of food and fodder as well as revenue for local families.

It is reported that three thousand people (FTE – full time equivalent) are employed in forestry in Armenia, or 9 FTE/1,000 ha.

ANNEX TABLE 5:

Goods and services provided by the forests of Armenia, most recent period.

Recorded total harvest	1,000 m3	33.5
Estimated total harvest, including non-recorded	1,000 m3	536
Wood fuel production (estimated)	1,000 m3	532
Share of wood fuel in wood production	%	92.7
Share of forest area with a designated management objective to maintain and enhance its protective functions	%	67.2
Share of forest strictly conserved for protection of biodiversity	%	33.2
Main non-wood forest products and services	-	Hay, livestock, forest fruits, honey, medicinal plants, game, recreation etc.
Employment in forestry, staff per hectare	FTE/1,000 ha	9.03
Net GHG emissions (source)/removals (sink) of forests per hectare of forest	tCO_2e/ha	-1.66

Source: FAO 2015, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

On average Armenian forests are reported to sequester 1.7 tCO_2e/ha, although this figure, like all the others, is based on incomplete and old forest inventories.

Major gaps in information on goods and services provided by the forest: It is desirable to monitor, if only by regular estimates, unrecorded removals from forests, as they are the major pressure on the forests. Likewise, an estimate of a reasonable sustainable harvest level, taking account of unrecorded removals, would be necessary to monitor the sustainability of forest management in Armenia. Further information on social aspects of sustainable forest management, notably livelihoods of forest dependent people, are necessary for reporting commitments under the United Nations Strategic Plan for Forests.

FOREST PRODUCTS MARKETS AND TRADE

There is a small wood processing industry in Armenia, producing 4,000 m^3 of sawnwood, 6,000 m^3 of panels and 8,000 m.t. of paper, about a fifth of national consumption. Per caput consumption is quite low by international standards at the 0.1 m^3 RE/cap. Twelve percent of forest products imports are from Russian Federation, while Turkey (18%), China, Ukraine and Georgia also export significant volumes of forest products to Armenia.

ANNEX TABLE 6:

Production, trade and consumption of forest products in Armenia, most recent period.

Production of sawnwood	1,000 m^3	4
Self-sufficiency in forest products	%	19.9
Consumption per head of forest products	m^3 RE/cap	0.1
Share of forest products imports from the Russian Federation	%	12.5

Source: FAO, 2016; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on forest products markets and trade: Given the small size of forest products markets, data quality seems adequate.

POLICIES AND INSTITUTIONS

The Forest Code was adopted in 2005 and has not been amended to this date, despite several proposals for revision. The law classifies forests by their significance, defines regulation procedures for private, community and state forests and the special procedures for conservation and utilization of forests and forest lands (ENPI EAST FLEG II, 2016/7).

Another major legal act - the National Forest Program - was approved on July 21, 2005 by the Government. It includes a plan of action with deadlines. It covers the period to 2015, but some activities, such as public communication or professional education are continuous and cannot be performed within fixed time boundaries. The National Forest Program includes also other planned activities that were never carried out (for example development of regulation on Licensing for Forest Use, which is envisaged neither in the Forest Code, nor in the Law on Licensing) (ENPI EAST FLEG II, 2016/7).

In 2018, there were major institutional changes and new structures were put in place. A "Forest Committee" and a "Department of Biodiversity and Forest Policy", were created within the Ministry of Nature Protection of the Republic of Armenia as well as other changes:

- The Department of Biodiversity and Forest Policy has a Department of Forest and Specially Protected Areas Policy and a Department of Biodiversity and Biosafety Policy. The functions of the Office of Biodiversity and Forest Policy include the development of policies, relevant laws and regulations, etc.
- The main task of the Forest Committee is to ensure the sustainable management of state forests in the field of conservation, protection and reproduction of forests.

Hyantar SNCO (State non-commercial organization), is under the control of the Forest Committee. Under Hyantar, there are 19 branches, which operate in the regions and carry out direct forest management in the localities. Hyantar also ensures the direct protection of forests, reproduction, sustainable use of forest resources. It also performs the following business activities – timber harvesting, processing and marketing, growing and marketing of planting stocks (seedlings, plantlets), non-timber forest use (hay harvesting, animal grazing, installation of bee-hives, collection of wild fruit, nuts, mushrooms, berries, medicinal herbs and technical raw materials), as well as processing and marketing of the aforementioned bio-resources, growing agricultural products on agricultural plots, processing and marketing; provision of recreation and tourism-related services as well as provision of consultancy services and information (ENPI EAST FLEG II, 2016/7).

A review of the policies and institutions of the forest sector in Armenia (ENPI EAST FLEG II, 2016/7) came to the following conclusions:

- The forest sector in Armenia is not currently being managed in an environmentally and economically sustainable manner due to:
  - Insufficient financial resources committed to the sector.
  - Overall lack of institutional capacity, best practices and skill sets.
  - High demand for a limited amount of wood resources.
- The current expenditure structure of the forest sector raises concern since no funds are set aside for long-term investment priorities, which leads to deterioration of road infrastructure, equipment and technologies.
- The current capacity of institutions, at all levels, is not sufficient to manage the forest sector effectively.
- The institutional structure of the [sector] complicates proper forest management.
- Hyantar is responsible for conducting two conflicting functions, managing the forests and using the forests to generate revenue, which limits its ability to excel in either function.
- Hyantar's existing institutional capacity cannot ensure sustainable management of the sector as:

  - Available human resources and skills level limit the organization's ability to implement the changes needed in the sector.
  - Internal processes and procedures, e.g. budgetary planning and monitoring, financial and management information system, HR development and training, do not allow efficient management of the forests.
- The forest resource base in Armenia is limited and a large share of it is used unofficially, bypassing existing official institutions, hence decreasing the level of self-generated revenues.

MAJOR CHALLENGES FOR THE FOREST SECTOR

On the basis of the information presented above, as well as other sources, the following major challenges have been identified:

- Putting forest management on a sustainable basis by fixing an allowable annual cut and ensuring that illegal logging does not go over that level.
- Improving the livelihoods of forest dependent people and forest workers.
- Expanding the forest resource where this is possible on a sustainable basis.
- Completing the reform of the forest sector institutions to increase their effectiveness and efficiency, by raising their capacity and skills and rationalising the functioning of the system.

DIRECTION OF FOREST SECTOR POLICY

The importance of forest questions is recognised, formally at least, at the highest level. The development strategy for Armenia states "Forest national program will be developed and implemented with the aim of forest plantation and restoration in the forests and forests' lands in the republic, as well as improvement of quality indicators of the existing forests and founding new forests. Improvement of control mechanisms against illegal forest logging will be carried out in parallel with forest plantation and recovery activities" (Government of Armenia, 2014).

However, not all the national forest programme was implemented before its end date in 2015, and a new programme has not been prepared. A recent international review (ENPI EAST FLEG II, 2016/7) concluded that there were many policy and institutional shortcomings preventing the forest sector in Armenia from reaching its potential.

In short there has been considerable reflection and analysis over the past years, despite a regrettable lack of objective information, and the broad lines of the challenges are well known: the priority should now be on creating a new national forest program, based on a consensus of all stakeholders, and taking the necessary political action to put its recommendations into practice. Above all, sufficient resources must be made available to implement the decisions made.

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ANNEX TABLE 7:

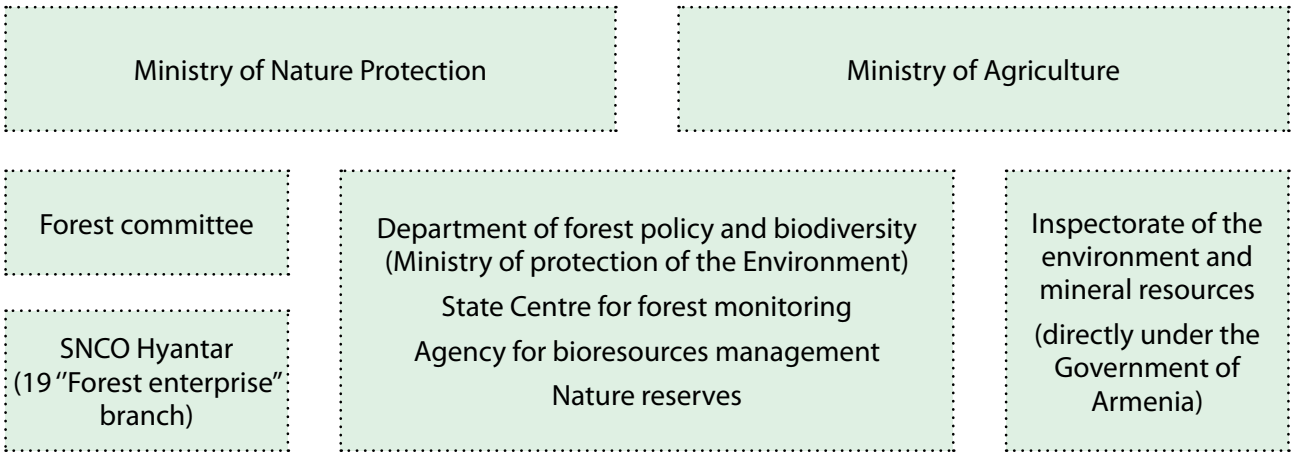
State forest related institutions in Armenia

Responsibility for policy formulation	Department of Forest Policy and Biodiversity, Ministry of Nature Protection
Enforcement of policy, monitoring	Ministry of Nature Conservation, Forestry Committee (55 employees)
Agency responsible for managing State Forest Fund	Hyantar SNCO (State Non-Commercial Organisation) manages 342.4 thousand ha of which 277.1 forest
Total employees of State Forest Fund	Hyantar employed 920 people in 2018 (there are 166 seasonal employees)
Of which central/ local?	52 people are employed in the central office of Hyantar
Sources of income of SFF: central budget, commercial, other	The source of funding for the Forestry Committee is the State budget. Sources of funding for Hyantar SNCO are State budget, and own revenues (timber sales, forest land rent, etc.), as well as international donors
Local agencies/forest management units/*leskhoz*:	
Autonomous or centrally managed?	Local branches have legal identity, but all decisions are taken centrally
How many units?	19 forest enterprises under Hyantar
How many staff?	868
Sources of finance for local units: budget or commercial enterprise?	See above
Other agencies who manage publicly owned forests	Bioresources Management Agency
Any discussion of other tenure forms (leasing, community forestry, privatisation etc)?	Apparently not

Source: Information provided by the national expert. For more information about sources of data and methods of estimation visit the publication's website.

ANNEX FIGURE 3:

Structure of the State forest related institutions in Armenia



ANNEX 3.2 FORESTS AND FOREST SECTOR OVERVIEW: AZERBAIJAN

By Kit Prins and Sadig Salmanov

CONTEXT

Azerbaijan is a mountainous country in the south Caucasus, with significant resources of oil and gas. Nearly half its population lives in rural areas. It is classified by the World Bank as "middle income" with GDP of over $4,100/cap. Less than 0.5% of its population is recorded as living in extreme poverty, defined as less than $1.90/day.

Forest cover is over 13%, and there is 0.1 ha of forest and 16 m^3 of growing stock for every inhabitant.

ANNEX FIGURE 4:

Map of Azerbaijan.

Source: United Nations Geospatial Information Section, 2014.

ANNEX TABLE 8:

Azerbaijan in context, 2017

Total area of the country (incl. water)	Million ha	8.7
Population	Million	9.6
Share of rural residents	%	46.9
GDP/person	$	4,132
Share of population living in extreme poverty (<1.90$/day)	%	0.5
Forest cover	%	13.2
Forest per inhabitant	ha	0.12

Source: FAO 2015, World Bank 2017, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

TRENDS FOR THE FOREST RESOURCE

Azerbaijan is a low forest cover country where the existing forests are unevenly distributed. Much of the forest area of Azerbaijan is located in the Greater and Lesser Caucasus and in the Talish Mountains. The mountain forests consist of a broad range of tree species, including Oriental beech (Fagus orientalis), Georgian oak (Quercus iberica), Chestnut oak (Quercus castaneifolia) and hornbeam (Carpinus betulus). Riparian (tugai) and plain forests in Azerbaijan occupy areas, where groundwater table is rather close to the surface. There is strong historical evidence that the tugai forests used to occupy extensive areas but now, due to intensive deforestation, most tugai forests have been replaced by urbanized lands (Abbasov, 2014). It is estimated that almost 85% of forests are in mountainous and hilly regions and 15% in the plains.

In accordance with the economic and ecological value, location and functions of the forests as well as their protection value, the country's forest resources are classified as *Group I forests*, i.e. where protection functions have priority (Government of Azerbaijan, 2013).

A steady increase in forest area is reported, although all reports speak of strong pressures on the forest, and deforestation. Information is generated from a forest account approach and not from an objective sample-based inventory, so these data may not reflect the real trend. Growing stock is reported at about 130 m^3/ha.

According to studies, deforestation in Azerbaijan may have many causes, mostly directly linked to agricultural activities, such as clearing areas to plant crops and road development.

Illegal logging is one of the main income sources for local population. Recently, the volume of illegal logging has significantly dropped. However, it still remains at high levels.

ANNEX TABLE 9:

Forest resources of Azerbaijan, 1988 and most recent

		1988	Most recent
Area of forest	1,000 ha	991.8	1,139.4
Area of other wooded land	1,000 ha	0	0
Forest and other wooded land	1,000 ha	991.8	1,139.4
Average annual % change in forest area	%	-	0.55
Growing stock	Million m^3	127.61	149.2
Share of primary forest	%	-	-
Share of plantations for wood production	%	-	22.5
Share of publicly owned forest	%	100	100
Share of public forest managed by state forest agency/enterprise	%	87.1	100
Proportion of forest area under a long-term forest management plan	%	100	-
Area of certified forest	Ha	0	0
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	-	-

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

The high profitability and lack of alternative income sources make illegal logging very attractive for local residents. Overgrazing is also one of the main drivers of deforestation. Due to increasing interest in 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 (Abbasov, 2014).

All forests are publicly owned and managed by the Department of Forest Development of the Ministry for Ecology and Natural Resources, which has local enterprises in forest areas.

No information was supplied on the share of primary forests, or of the degree of disturbance by fires, insects or diseases. Plantations are reported to account for 22.5% of the forest area. FRA 2015 reported that reforestation by sowing and planting has been on average 3,427 ha/y in Azerbaijan between 2000 and 2017.

There is no certification standard in Azerbaijan, for PEFC or FSC, and no management unit has been certified.

Major gaps in information on the forest resource: the first priority should be to carry out a modern sample-based forest inventory to establish on an objective basis, the extent, nature and condition of the forest, as well as identifying the major pressures on it.

ANNEX FIGURE 5:

Forest around mountain resort in the Caucasus

Source: iStock.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

An estimated 90,000 m^3 of wood is harvested in Azerbaijan, practically all for fuel; most of this is unrecorded/illegal. 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, but this is no longer available. Several studies confirm that average household wood use is nearly 12-15 m^3. During the summer, most Azerbaijan forests are used as the primary grazing areas for cattle, sheep, water buffalo, goats, horses.

ANNEX TABLE 10:

Goods and services provided by the forests of Azerbaijan, most recent period

Recorded total harvest	1,000 m^3	6.5
Estimated total harvest, including non-recorded	1,000 m^3	90
Wood fuel production	1,000 m^3	90
Share of wood fuel in wood production	%	100
Share of forest area with a designated management objective to maintain and enhance its protective functions	%	77.5
Share of forest strictly conserved for protection of biodiversity	%	22.5
Main non-wood forest products and services	-	-
Employment in forestry, staff per hectare	FTE/1,000 ha	1.76
Net GHG emissions (source)/ removals (sink) of forests per hectare of forest	tCO_2e/ha	-4.78

Source: FAO 2015, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

As regards services, forests are the major sources of water that is naturally purified and filtered. Almost all the forested regions of the country have no water treatment plants and human populations directly use natural water supplies from the forests (Abbasov, 2014).

A significant proportion of forests and other wooded land is protected relatively well, as it is included in national parks and nature reserves (Abbasov, 2014). The national expert reports that 22.5% of forests are protected for conservation of biodiversity.

As regards non-wood forest products, in 2001-2017, forestry enterprises harvested 12.2 thousand tons of hay, 316.5 tons of grain, 693.2 tons of wild fruits, 141 tons of citrus fruits, 491.6 tons of other fruit, 33.6 tons of honey, 579 tons of nut-bearing fruits, 454.9 tons of vegetables and 1,440.7 tons of pomegranate.

It is reported that there are 1.7 forest workers (FTE – full time equivalent) for 1,000 ha of forest in Azerbaijan.

Azerbaijan reported that its forests sequestered nearly five tons of carbon/ha/year. It should be pointed out however,

that this figure ultimately derives from the unreliable data on area and growing stock presented above, and might be revised, up or down, if new inventory data became available.

Major gaps in information on goods and services provided by the forest: Very little information is available on the goods (wood and non-wood) and services supplied by the forests of Azerbaijan, for local use in forest areas, or elsewhere, and as a source of revenue. This makes it difficult to make the case for managing forests in a sustainable way. There is an urgent need not only to make a reliable estimate of wood harvests, including non-recorded and auto consumption, but also of the main non-wood products (what products, what volumes, for which uses?). It would be a useful support for policy making to list the main environmental benefits supplied by forests (erosion protection, water supply and purification, landscape, carbon sequestration, grazing, recreation/tourism), and assess their contribution, as well as possible threats to their supply, as suggested by the TEEB scoping study (Abbasov, 2014). It is also necessary to know more about livelihoods of forest dependent people, including extreme poverty, in order to be able to report on commitments made under the United Nations Strategic Plan for Forests.

FOREST PRODUCTS MARKETS AND TRADE

Consumption of forest products is, unsurprisingly, at low levels in Azerbaijan (0.1 m^3RE/cap). There is practically[9] no wood processing industry in Azerbaijan, so all products must be imported, with the Russian Federation as the main supplier.

Major gaps in information on forest products markets and trade: given the small size of the market, data quality is not a serious concern.

ANNEX TABLE 11:

Production, trade and consumption of forest products in Azerbaijan, most recent period.

Production of sawnwood	1,000 m^3	0
Self-sufficiency in forest products	%	6.6
Consumption per head of forest products	m^3 RE/cap	0.1
Share of forest products imports from the Russian Federation	%	51.8

Source: FAO, 2016; 6 national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

POLICIES AND INSTITUTIONS

All forests of country are publicly owned and managed by the state in accordance with the provisions of the Forest Code and the Law on Environmental Protection. They are transferred to the permanent use of forestry enterprises for the intended purpose for the development of Forestry (Government of Azerbaijan, 2013).

The forest policy of the country is managed by the Department of Forest Development, under the Ministry of Ecology and Natural Resources. The department takes care of the protection and preservation of forests, restoration and planting of forests, preparation of planting stocks, storage of forest trees and bushes, preservation of forests and other forestry actions, which includes the efficient and purposeful utilization of forest reserves and related spheres of agriculture. It also works on the improvement of the protection of forest soil, water preservation, a clean environment, sanitarian and hygienic actions, preservation of species of animals in the forests, ensuring biodiversity, the establishment of cultural, scientific and recreational complexes throughout nature, as well as the protection and expansion of the gene pool in the growth of forest seed.

The financial support of department's activity is realized from the budget of Azerbaijan Republic as well as from other sources provided in the legislation (Government of Azerbaijan, 2013).

There are provisions in the basic laws for other forms of tenure, including leasing, transfer to natural and legal persons on a contractual basis, or management by local government, provided that Forest Fund land is used by forest authorities and other state and non-state enterprises, institutions and organizations to which they have been assigned for the implementation of their statutory activities (Government of Azerbaijan, 2013), but this does not seem to be implemented, and in practice all forest land is managed by the Department of Forest Development.

A National Programme for Forest Expansion and Restoration was promulgated in 2013 (Government of Azerbaijan, 2013), which contains a policy statement and an action plan, which are summarised below.

MAJOR CHALLENGES FOR THE FOREST SECTOR OF AZERBAIJAN

The main challenges of Azerbaijan forestry include degradation of forest resources and deforestation, shortages in meeting the needs and demands of the society for goods and other socio-economic and environmental services of the forests; inadequate stakeholders' participation and inter-sectoral collaboration in the forest management practices.

More effective forest protection measures are needed, including:

- against illegal logging,
- against overgrazing and other damages, and
- against negative effects of picnic-based tourism activities in or around forested areas,
- against wildfires.

[9] There is some production of paper, presumably on the basis of imported pulp or recovered paper.

Conservation of ***tugai*** and mountain forest ecosystems with their biodiversity etc. is among the main challenges of the Ministry of Ecology and Natural Resources in Azerbaijan.

The responsibilities and authorities of the units, both in the central organization and in the field, which are directly and/or indirectly dealing with forestry issues, are not clear so that the situation often creates conflicts among these units. Furthermore, effective cooperation among these is not good enough.

Forest based inventory and data being used for planning and management of the country's forests are generally out of date. The state forestry sector has some difficulties in accessing modern inventory tools and techniques to supply reliable and up-to-date data for an appropriate and applicable planning and management of forest resources. Inventories for accurate data on forest resources, periodic validation and updating of existing figures are also being carried out in very low standards with old-fashioned and out of date methodologies in Azerbaijan.

Furthermore, the Azerbaijan forestry sector has a great need for qualified and experienced personnel resources at all levels. The institutional capacity of the Ministry as well as the Forestry Department for forest based cadastral surveys and management planning, monitoring and assessment of forests needs to be strengthened.

DIRECTION OF FOREST SECTOR POLICY IN AZERBAIJAN

The main points of the Action Plan (Government of Azerbaijan, 2013) are summarised below:

- ***Institutional capacities*** in forestry need to be developed and improved including particularly forest inventories, finance and legal framework, forestry cadastre and management plans, monitoring and assessment of forests etc.
- The Ministry of Ecology and Natural Resources as the key Ministry responsible for the forests across the nation must do more to explain to the general public why forests are so important for the well-being of the country. A ***communication strategy*** is much needed to improve communication of the Ministry of Ecology and Natural Resources with the key stakeholders and broader audience in the forestry realm in Azerbaijan since forests comprise diverse interests of a wide variety of stakeholders.
- ***Expansion of the forested area*** is an important target, which requires land other than forested land and forest fund land. Therefore, the forestry sector has to establish good linkages with other Committees in order to create appropriate lands for afforestation.
- In this regard, the institutional capacity of ***forestry organization and good governance*** in central and field levels should be strengthened and roles and contributions of local administrations for forest protection should be revised and enforced.
- ***Human-induced harmful effects and damages*** on forest resources, in particular on illegal logging, over-grazing, recreation and tourism pressures on forested areas should be eliminated through comprehensively prepared measures.
- Because Azerbaijan is quite poor in terms of forested land, expansion of the forested areas through afforestation and new plantation is among the major forestry priorities of the Azerbaijan government as well as the MENR. The target of the Ministry declared unofficially by authorities is ***to increase forest area from 11 percent up to 20 percent*** of the country's land as a mid-term goal. This declaration reflects the willingness of the state forestry sector although the target seems unrealistic unless new suitable (quality and quantity) land is allocated for afforestation and tree plantation (Government of Azerbaijan, 2013).

The nine priority objectives of the National Forest Policy of Azerbaijan were defined as follows, and each is accompanied by specific actions listed in the Action Plan:

1. *Forest policy is well integrated with the national, regional and sectoral policies and is put high in the national development agenda.*
2. *Given the first priority to preservation of ecological and protective functions of forests, sustainable management and use of forest resources is contributing to a better satisfaction of the needs of society at large and rural population in particular.*
3. *Negative impacts on forests are reduced and forest resources and biodiversity are effectively protected and conserved.*
4. *Forest areas and tree cover are significantly expanded through afforestation on suitable lands and restoration of degraded forest areas.*
5. *Forests are managed in line with integrated multipurpose management plans, elaborated based on reliable information and modern methodologies for forest resource inventory, and assessment.*
6. *People of Azerbaijan are aware of the benefits of forests and actively involved in sustainable forest management.*
7. *Institutional capacity, financial mechanisms and regulatory (legal) framework for sustainable forest management are improved and strengthened.*
8. *Enhanced forest education and research is providing essential backstopping to sustainable forest management.*
9. *Climate change adaptation and mitigation concerns are integrated into forest management decisions and implementations.*

The Forest Policy and the Action Plan were approved in 2013, although the author is not aware to what extent these measures are being implemented. Within the context of the Action Plan an inventory is being started with the help of FAO.

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ANNEX TABLE 12:

State forest related institutions in Azerbaijan

Responsibility for policy formulation	Ministry of Ecology and Natural Resources of Azerbaijan (MENR).
Enforcement of policy, monitoring	
Agency responsible for managing State Forest Fund	Forestry development service at the Ministry of Ecology and Natural Resources (FDS).
Total employees of State Forest fFnd	
Of which central/ local?	The Department has five Divisions at the headquarters and, 33 forest protection and rehabilitation enterprises, 6 forest nurseries and 2 regional afforestation enterprises in the field level. However, "The responsibilities and authorities of the units, both in the central organization and in the field, which are directly and/or indirectly dealing with the forestry issues, are not clear so that the situation often creates conflicts among these units. Furthermore, effective cooperation among these units (e.g. FD, Department of Biodiversity and Protected areas, Ecology Inspection Divisions) is not good enough." (Government of Azerbaijan, 2013).
Sources of income of SFF: central budget, commercial, other	The financial support of department's activity is realized from the budget of Azerbaijan Republic as well as from other sources provided in the legislation.
Local agencies/forest management units/*leskhoz*:	
Autonomous or centrally managed?	The local enterprises are part of the FDS. "The Institute together with the Department of Forest Development introduces the recommendations to subordinate enterprises (forest enterprises and nurseries). All controls for the process of introduction to the production should accordingly be done by the sectors of the Forest Development Departments." (Government of Azerbaijan, 2013).
How many units?	33, plus nurseries and afforestation enterprises (see above).
How many staff?	
Sources of finance for local units: budget or commercial enterprise?	See above. Mostly from central budget.
Other agencies who manage publicly owned forests	Department of Biodiversity and Protected Natural Areas and Ministry of Culture and Tourism (MCT) have responsibilities concerning forests but are apparently not directly involved in management. Local communities and municipalities are not involved in the management of forests, although communities depend on forests for fuel.
Any discussion of other tenure forms (leasing, community forestry, privatisation etc)?	There is no opportunity for representatives of the private sector or local communities to participate in management of forests. Nevertheless, the draft of the national forest 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 an issue of public debate.

Source: Information provided by the national expert. For more information about sources of data and methods of estimation visit the publication's website.

ANNEX 3.3 FORESTS AND FOREST SECTOR OVERVIEW: GEORGIA

By Kit Prins, Merab Machavariani, Natia Tskhovrebadze and Antje Fischer

CONTEXT

Georgia is a mountainous country in the western Caucasus, bordering on the Black Sea. It has a population of 3.7 million people and an area of around 7 million ha. It is classified as "middle income" by the World Bank, with GDP/head of $4057. Nearly ten percent of its population live in extreme poverty, defined as revenue below $1.90/day. It has forest cover of over 40%, much more than any other country in Caucasus and Central Asia. There are 0.76 ha of forest for each Georgian, which is significantly less than the European average (1.2 ha/person), but more than most other countries in the region.

ANNEX FIGURE 6:

Map of Georgia.

Source: United Nations Geospatial Information Section, 2015.

ANNEX TABLE 13:

Georgia in context, around 2015.

Total area (incl. water)	Million ha	7
Population	Million	3.7
Share of rural residents	%	42.8
GDP/person	$	4,057
Share of population living in extreme poverty (<1.90$/day)	%	9.8
Forest cover	%	40.6
Forest per inhabitant	ha	0.76

Source: FAO 2015, World Bank 2017, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

TRENDS FOR THE FOREST RESOURCE

Around 40% of Georgia is covered by forest (2.8 million ha). The majority of the forest is mountain forest and only 2% is lowland forest. Thus around 80% of country's forest has important protection functions. The majority of Georgian forest is of natural origin, only 2.6% have been reported as planted forest. The forest is rich in biodiversity and hosts a high level of endemism. The country is listed in two "biodiversity hotspots": the Caucasus and the Irano-Anatolian hotspots. WWF also identified the area as one of the priorities "Global 200 Ecoregion".

Nearly 8.6% of Georgia (595,963 ha) is declared as protected area, of which 45% (267,000 ha) is covered by forest. There is no reliable information about primary forests in Georgia, but 500,000 ha have been reported as primary forest unchanged since 1990. Primary forests are found especially in protected areas and on steep slopes, which are inaccessible. In addition, the Emerald Network is currently under development in Georgia. It consists of around 800,000 ha of State Forest Fund: the already adopted sites cover around 600,000 ha. 348,300 ha of forest have been declared as recreation or resort forest. Only around 20% (587,500 ha) of Georgia's forests were reported in 2015 as 'forest area available for wood supply' according to the Forest Europe definition.

All forest land is state-owned, and the great majority is managed by the National Forestry Agency. Some forests are subject to long-term harvesting licenses that were issued during 2007 – 2011. According to the data given in the State Audit Report, 166,654 ha were under long-term license contract in 2013. However, "forest licensing process and ineffective usage of state resource, did not ensure maximization of general welfare of the state" so, the practice has been stopped. Since 2011 no new licenses have been issued. In 2018, 145,000 ha remained under license contract. The last contracts will expire in 2027.

At the beginning of the 19th century, forest cover in Georgia was over 60%, but since then there has been significant deforestation, during Tsarist times, and under the Soviet Union, especially from the 1930s to the 1950s. However, in the mid-1960s, Georgia's forests were classified as Group 1 (protective), and fellings fell sharply, from 1.6-2 million m^3 to below 0.5 million m^3 per year. After independence (1991), under the pressure of shortages both of wood and energy, there was also strong pressure on Georgian forests. A high proportion of logging has been carried out without proper authorization or without any authorization at all and has not been officially recorded (Garforth, et al., 2016). At the same time, there has not been any national or forest district level inventory since the collapse of the Soviet Union. The inventory materials from the Soviet period are outdated and do not reflect the real condition of forests today (The State Audit Office of Georgia, 2016). As a result, it is not possible to quantify recent trends in forest area and growing stock with any certainty.

Between 2007 and 2012, inventories were carried out only in areas under long-term licence contracts (around 166,654 ha, The State Audit Office of Georgia, 2016). After a long period without proper forest inventories, regular management level inventories were reintroduced in 2013 for the elaboration of 10-year forest management plans. In 2018, a total 367,940 ha were covered by management plans (13% of total forest area). The methodology of management level inventory and taxation, which is used in Georgia, provides the necessary information for management planning. Nevertheless, MEPA is reviewing the methodology and considers improving it to ensure getting statistically sound and reliable information in the future[10].

In addition to this, it is important to underline that Georgia initiated the first National Forest Inventory (NFI) in 2018. The methodology was developed during 2016 – 2017 and is based on systematic sample plot assessments in a grid of 3.6 km, combined with remote sensing data. The NFI will be conducted every ten years. The NFI will provide reliable information about the quantity and quality of Georgian forests and their biodiversity as a basis for political and strategic decision-making processes and national as well as international reporting. The results of the first Georgian NFI are expected to be available in 2020.

[10] Current assessments as part of the inventory for 10-year management plans are done based on the sample plots that are only measured in those areas, where harvesting operations are planned in the coming 10 years. In addition, the positions of the sample plots are selected subjectively by the surveyor. This way, the method provides sufficient information for planning the management interventions, but the data from the sample plots cannot be analysed statistically. The methodology needs to be improved in order to get statistically viable data.

ANNEX TABLE 14:

Forest resources of Georgia, 1988 and most recent

		1988	Most recent
Area of forest	1,000 ha	2,757.6	2,822.4
Area of other wooded land	1,000 ha	80	6.9
Forest and other wooded land	1,000 ha	2,837.6	2,829.3
Average annual % change in forest area	%	-	0.09
Growing stock	Million m^3	421.62	454.5
Share of primary forest (estimated)	%	-	17.7
Share of plantations for wood production	%	-	2.6
Share of publicly owned forest	%	100	100
Share of public forest managed by state forest agency/enterprise	%	78.7	94.3
Proportion of forest area under a long-term forest management plan	%	100	13
Area of certified forest	Ha	0	0
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	-	-

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on the forest resource: Forest inventories have not been implemented for several decades. As a result, it is not possible to assess recent trends concerning the quantitative and qualitative status of Georgia's forests.

But as stated above, statistically sound information will be available from 2020 onwards based on regular National Forest Inventories as prerequisite for evidence-based formulation of forest policy as well as national and international reporting. In addition, detailed information will be available in the near future from forest inventories and taxations on the forest district level, which are implemented as the basis for 10-year management plans.

ANNEX FIGURE 7:

Forest in Georgia.

Source: iStock.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

As stated above, nearly 80% of Georgia's forests have a designated management objective to maintain and enhance protective functions. Only 20% of the total forest area is available for wood supply, but according to the legislation these areas also have to fulfil erosion control and water protection functions. Nearly 10% of the total forest is conserved for protection of biodiversity in protected areas, but the conservation of biodiversity is also considered in the management of forest areas outside the protected area system.

Official statistics record wood harvest of around 500,000 m^3 per year including industrial wood and fuelwood, but it is acknowledged that large volumes are logged illegally (State Audit Office Report, 2016). One study (Garforth, et al., 2016), analyses the available evidence in some detail and concludes that total felling must be around 3 million m^3, of which about 2.3 million m^3 fuelwood (legal and illegal). The study, which is focused on the potential for a wood-based industry, states that "in spite of the data uncertainties, it can be concluded that illegal logging is a tremendous problem in the Georgian forest sector. It constitutes about 75% of the total yearly harvest. This harvest level is far from sustainable and will deplete the existing forest capital within a short timeframe"

In the National Forest Concept (2013) it is stated that "A large area of the Forest Fund is severely degraded as a result of inadequate forest practices over a long period of time. Degraded forest landscapes are more prone to landslides and avalanches" (Ministry of Environment and Natural Resources Protection, 2014).

In 2018, 86 protected areas in different IUCN categories with an area up to 595,963 ha were reported by the Agency for Protected Areas. It was stated that 267,000 ha of the protected areas are covered by forest (9.46% of total forest area).

A wide range of non-wood forest products (NWFPs) are collected and, used mostly for own consumption, not sale (FAO, 2006). Until now only three NWFPs (Cones/seeds of Abies nordmaniana, bulbs of Galanthus woronowii and Cyclamen coum) are commercially collected and marketed under a licence system. In future the commercial collection of additional NWFPs will be exclusively done by the forest management bodies.

In 2016, the World Bank conducted a household survey in Georgia with a large representative sample of 950 households. The study captured data on rural household income and forest use. The findings from the survey demonstrate that forests are an important resource in rural areas for people that use wood-based products in their daily lives. The use is mostly for non-commercial, subsistence purposes and forests have not contributed significantly either as a source of employment or as a source for economic activity.

According to the household survey conducted by the World Bank in Georgia "the forest sector's contribution to GDP is small at about 0.4%, but the true value is likely higher due to the large size of non-market fuelwood production, other unreported forest extraction, and non-monetized environmental services."

One increasingly important opportunity for monetizing environmental services is ecotourism and adventure tourism. The national tourism strategy recognizes Georgia's natural heritage as one of the key assets for tourism development. In addition, based on a combination of field studies tracking tourist statistics in both protected areas and perspective nature-based tourist areas confirm that Georgia has substantial natural resources and the capacity to develop nature-based tourism. It should be mentioned that the number of visits to the protected areas of Georgia increased about 60 times from 2007 to 2013. In 2013, more than half (52%) of tourists were involved in nature-based tourism and another 13% exploited adventure tourism which also depends on well-managed environment. The level of government commitment, promoting forest-based tourism can be a potential route for forest-dependent households to diversify into high-return income generating activities in future (Forests, Livelihoods, and Poverty Linkages in the Forest Communities of Georgia, World Bank, 2018).

Currently, all of Georgia's forests are state-owned and the operational and management functions are carried out by management bodies: National Forest Agency, Agency of Protected Areas, Ajara Forest Agency and Akhmeta Municipality for the Tusheti protected landscape. 1,756 employees are recorded as working in the four different forest management bodies, which gives a national average of 0.6 staff/1,000 ha. However, there are significant differences between forest management agencies:

- NFA: 0.55 staff/1,000 ha, (988 staff for 1.8 million ha)
- APA: 0.97 staff/1,000 ha, (574 staff for 0.59 million ha)
- Ajara forest agency: 1.18 staff/1,000 ha (178 staff for 0.15 million ha)
- Tusheti protected landscape: 3.2 staff/1,000 ha (16 staff for 5,000 ha)

Until now there has been no Georgian forestry standard for certification and no forest management unit has been certified, either by PEFC or FSC. Nevertheless, the National Forest Concept expresses the intention to start the process by drawing up a national standard for approval by FSC and/or PEFC. (Ministry of Environment and Natural Resources Protection, 2014). On 3 April 2018, FSC approved *Controlled Wood Risk Assessments for Georgia* that identified risk assessment indicators for specified risks. The study concluded that if companies are intending to source controlled wood from Georgia, they should implement control measures to mitigate all identified risks.

In this context, it is important to underline that in 2014 Georgia started to elaborate national criteria and indicators for sustainable forest management based on the ecological, social and economic principle of sustainable forest management. These criteria and indicators will be considered in an adjustment of the subsidiary legal framework as soon as the new forest code is approved by the parliament, which is planned for 2019.

Georgia reported to UNFCCC that its forest sequestered 5.5 million tons of GHG (CO_2 equivalent), or just under two tons of CO_2 per hectare per year. Taking into consideration that there is no reliable information about the status of the forest and the amount of unauthorised wood harvesting during the last decades these figures should be used with care.

ANNEX TABLE 15:

Goods and services provided by the forests of Georgia, most recent period.

Recorded total harvest	1,000 m^3	452
Estimated total harvest, including non-recorded	1,000 m^3	3,000
Estimated wood fuel production	1,000 m^3	2,300
Estimated share of wood fuel in wood production	%	76.7

Share of forest area with a designated management objective to maintain and enhance its protective functions	%	78
Share of forest strictly conserved for protection of biodiversity	%	9.5
Main non-wood forest products and services	-	Fruits, nuts, berries, grazing, hunting, medicinal herbs, flower bulbs, seeds etc.
Employment in forestry, staff per hectare	FTE/1,000 ha	0.6
reported Net GHG emissions (source)/ removals (sink) of forests per thousand hectares of forest	tCO_2e/ha	-1.9

Source: FAO 2015; FAO 2010; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on goods and services provided by the forest: It is not possible to provide a realistic assessment of the economic value of Georgia's forest until reliable information based on the first National Forest Inventory and Management Level Inventories is available.

The annual estimation of unrecorded removals, as support and justification for efforts to reduce illegal logging, is recommended.

FOREST PRODUCTS, MARKETS AND TRADE

According to official data supplied to UNECE/FAO, the consumption of forest products is at low levels in Georgia (0.2 m^3 roundwood equivalent per head, as compared to 0.86 in Europe, according to SoEF 2015), but nearly 30% of this is produced domestically. There are however many illegal sawmills, so this may well be an underestimate. About 6% of imports (sawnwood, panels, pulp and paper together) originate in the Russian Federation: the main suppliers are Turkey (47%) and China (11%).

ANNEX TABLE 16:

Production, trade and consumption of forest products in Georgia, most recent period.

Production of sawnwood	1,000 m^3	61
Self-sufficiency in forest products	%	29.7
Consumption per head of forest products	m^3 RE/cap	0.2
Share of forest products imports from the Russian Federation	%	6.2

Source: FAO, 2016; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on forest products markets and trade: The available data does not consider the huge amount of unauthorised and unrecorded wood harvest and trade.

POLICIES AND INSTITUTIONS

A considerable number of changes have been made in the forestry sector of Georgia between 1990 and 2012. The Forest Code that is currently in force was approved in 1999 and has been amended frequently. There have been several reorganizations of the forestry sector since 2000. Constant changes in law, structure and leadership as well as the lack of investment in human and technical resources had a negative influence on the forestry sector of Georgia. Due to a lack of a clearly defined strategy and action plan the establishment of a sustainable forest management system was impossible during this period.

In 2012, the government of Georgia adopted the decision on changing formal forest management practices and decided to implement a comprehensive forest sector reform. In December 2013, the Parliament of Georgia adopted the National Forest Concept - Georgia's first national forest policy – which was developed with strong stakeholder participation.

The principles of the concept are in accordance with statements and commitments in international agreements relevant to forestry and recognized by Georgia:

- The overarching guiding principle is **sustainable management of forests** according to the definition of the Ministerial Conference on the Protection of Forests in Europe.
- Management of forests has to consider the role of forests and associated ecosystems and apply a **precautionary principle** whenever management decisions may disturb the ecological balance.
- All forests are local thus the priority shall be given to meeting the needs of the local population.
- Separation of policy, management and supervision functions.
- The forest sector as an integral part of sustainable development of Georgia in order to facilitates the development of associated sectors (agriculture, energy, tourism, service, etc.).

According to the statement of the National Forest Concept, the policy, management and supervision functions were successfully separated in practice in 2013 and currently, the Ministry of Environmental Protection and Agriculture of Georgia (MEPA) is the highest body of executive government responsible for the elaboration, implementation and enforcement of the national forest policy, by means of its structural entities:

- The Department of Biodiversity and Forestry of the MEPA is responsible for the elaboration of the forest policy and strategies, as well as the drafting of the legal framework on national level, in addition the department is responsible for the monitoring of the forest status, national and international reporting and the approval of forest management plans.
- Two legal entities of public law, the National Forestry Agency (NFA) [11]and the Agency of Protected Areas are responsible for the management of the State Forest Fund.
- On the territories of the autonomous republics of Abkhazia and Adjara, the forests are managed by the corresponding authorities of these autonomous republics. In addition to the abovementioned state bodies, the Akhmeta municipal government is the only municipality which is involved in the management of forests.
- The Department of Environmental Supervision, a state subordinated agency of the Ministry, is responsible for the control of forest management, of harvesting operations and of the transport of wood and forest products in the whole territory of Georgia through its territorial units.

To strengthen the sustainable management of forests Georgia has embarked on a number of significant initiatives.

In 2013, the National Forest Program (NFP) process was launched as an instrument of involvement of stakeholders in the decision-making processes in order to support the Forestry Sector Reform. Since 2013, more than 300 meetings have been held in the framework of the NFP process. Up to 270 stakeholders from different ministerial sectors, academia, the private sector, the NGO sector and several international development partners were involved in the NFP process.

Based on the National Forest Concept a forest sector reform strategy and action plan has been elaborated, which has been approved by the government as part of the National Environmental Strategy and Action Plan 2017-2021 with the following goal: "Improvement of the general condition and ecological functions of the forests, through the introduction of sustainable forest management system in Georgia".

An important milestone was the elaboration of the new Forest Code. The draft Forest Code was elaborated with strong stakeholder participation. In February 2019 it was submitted to the Parliament of Georgia for approval. The new Forest Code is a precondition for modernizing forest management practices according to the principles of sustainable forest management. It proposes a new and advanced way forward for the forest sector by:

- Introducing a new definition of forests.
- Introducing a forest management system based on sustainable forest management principles.
- Establishing a system for forest functional categorization and setting up proper management regimes.
- Creating the legal basis for the National Forest Inventory and the establishment of a comprehensive forest information and monitoring system for effective governance of forest resources.
- Changing the social cutting practice.
- Introducing new structure of forest ownership.
- Establishing new and improved institutional set-up with clearly distributed functions of forest policy, management and supervision functions, thus creating preconditions to use forest resources in rational, efficient and sustainable way.

After the approval of the new Forest Code, the respective regulations will be promulgated.

Another important milestone was the elaboration of the methodology for Georgia's first National Forest Inventory and the establishment of a Forest Information and Monitoring Systems.

In parallel, Georgia is working on the elaboration of National Principles, Criteria and Indicators for Sustainable Forest Management. All these efforts aim to strengthen forest policy planning and management, especially in light of Georgia's international commitment as well as national plans and priorities.

However, this is only a beginning and much remains to be done on the ground: wood removals are far above sustainable levels and additional human and technical capacity and financial resources are needed to protect forests from illegal use, logging and grazing, to ensure that the impacts of logging are kept as low as reasonably practical, to restore degraded forest territories, and to ensure that tending operations are carried out at the appropriate time (Garforth, et al., 2016).

MAJOR CHALLENGES FOR THE FOREST SECTOR

The National Forest Concept (Ministry of Environment and Natural Resources Protection, 2014) lists the following main problems:

- Imperfect legislation, weak forest management institutions and poor enforcement of law
- Insufficient consideration given to forest values in planning and decision-making process
- High level of poverty in rural areas and lack of affordable alternatives to firewood and alternative pastures are forcing people to use forest resources illegally and unsustainably
- Inadequate financing for the forest sector

[11] The main objectives of NFA are forest management planning, forest protection and maintenance, allocation of fuelwood for the population as well as supply of fuelwood to public organisations (schools, kindergartens, hospitals, etc.). As NFA is a legal entity of public law, the possibilities to carry out any kind of forest management activities with commercial goal are limited. Therefore, NFA is mainly dependent on the allocations from the state budget (EU Twinning report on "Concept of state forest enterprise for Georgia", 2018).

DIRECTION OF FOREST SECTOR POLICY

Improvement of forest management planning, ensuring rational use of forest resources, determining the most appropriate practices of forest ownership, response to climate change aspects and elaboration of relevant national legislation, as well as raising education and public awareness are set out in the National Forest Concept as main priority directions for implementation of sustainable forestry in Georgia.

According to the National Principle, Criteria and Indicators for SFM of Georgia, the following priorities have been identified:

- Promote multifunctional forest use ensuring enhanced protective and productive functions of forest. That also includes development of recreation and nature-based tourism opportunities in and around forest areas.
- Maintain and enhance the natural biodiversity of the forests not only in protected areas but outside protected area systems as well.
- Promote processing of wood and other forest products in the country in order to establish a sustainable forest industry.
- Increase the contribution of forests to the green economy especially in rural development.

In addition, the third National Environment Action Programme, 2017-2021 contains a detailed section on Forest Management, which is based on the National Forest Concept. It identifies the following long-term goal (2030) and 5-year targets:

Goal: To improve the overall condition and ecological functions of forests through establishment of a sustainable forest management system in Georgia.

Targets:

Target 1: Improve the legal framework and implement the Sustainable Forest Management system.

Target 2: Reduce the pressure on the forest through promoting the use of alternative fuel sources and improve the qualitative and quantitative characteristics of forests.

Target 3: Capacitate the forest policy, management and supervising entities.

Target 4: Promote the use of forest ecosystem services.

Target 5: Promote forestry education and ensure the public awareness raising.

For each target, the Action Programme identifies a number of activities, indicators, responsibilities, costs, sources of funding and risks. The way forward now appears to be clearly set out, and the means are being put in place to achieve the stated targets. Furthermore, the forest strategy is firmly embedded in a wider statement of policy, for the environment as a whole, approved at the policy level.

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ANNEX TABLE 17:

State forest related institutions in Georgia.

Responsibility for the formulation of policy, strategy and legal framework as well as monitoring	Ministry of Environmental Protection and Agriculture of Georgia (Department of Biodiversity and Forestry, Forest Policy Division, 7 staff)
Enforcement of legal regulations	Department of Environmental Supervision (15 staff on central level related to forest law enforcement)
Agency responsible for managing state forest fund	National Forestry Agency (NFA): 1.8 million ha
Total employees of state forest fund	1,756 employees National Forestry Agency (NFA): 1.8 million ha – 128 employees in central office, 860 employees on local level Agency of Protected Areas (APA) – 574 employees of which 50 on central level Adjara Autonomous Republic – central level: 40 employees, local level: 138 employees (Total 178) Tusheti Protected Landscape – 16 employees all at local level
Of which on central / local level?	218/1,538
Sources of income of the NFA: central budget, commercial, other	NFA has several sources of income: • Revenues from compensation fee • Revenues from issuing timber logging ticket • Revenues from placement of communication facilities, • Furthermore, social cuts provide fuelwood at subsidised prices for rural families, at the cost of the balance of the NFA accounts. • Since 2017, there has also been income from supply of fuelwood to public institutions.
Local agencies/forest management units/*leskhoz*:	
Autonomous or centrally managed?	2 autonomous republics with their own structure NFA and APA have central offices in Tbilisi and units in regions
How many units?	Nine regional offices
How many staff?	See above
Sources of finance for local units: budget or commercial enterprise?	Central budget, plus minor income from wood sales
Other agencies, who manage state-owned forests	• 267,000 ha under the Agency for Protected Areas. • 150,000 ha under the Forestry Agency of the Autonomous Republic of Adjara. • 5,000 ha managed by the Municipality of Akhmeta in the Tusheti protected landscape. • about 433,517 ha are in the Autonomous Republic of Abkhazia and South Osetia out of the control of the Government of Georgia.
Any discussion of other tenure forms (leasing, community forestry, privatisation etc)?	Long-term licences have been given, but this practice has ceased. In 2018, still 145,000 ha of forest are under long-term license contracts. The last contracts will expire in 2027.

Source: National experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website

ANNEX 3.4 FORESTS AND FOREST SECTOR OVERVIEW: KAZAKHSTAN

By Kit Prins, Maxat Yelemessov and Nurlan Raimkulov

CONTEXT

Kazakhstan is a large landlocked country in Central Asia, spreading from the Caspian Sea and southern Siberia to the mountains of Central Asia. It has wide expanses of steppe, desert and mountain, and considerable reserves of minerals, oil and gas. It is classified as middle-income by the World Bank (GDP over $9,030/head). Forty-five percent of the population live in rural areas. Only a small part of its population lives in extreme poverty. It has a resource of forest and other wooded land of about 13 million ha, but this is less than 5% of land area. There is about three quarters of a hectare of forest and other wooded land for each resident, rather higher than in the rest of central Asia.

ANNEX FIGURE 8:

Map of Kazakhstan.

Source: United Nations Geospatial Information Section, 2004.

ANNEX TABLE 18:

Kazakhstan in context, around 2017.

Total area (incl. water)	Million ha	272,5
Population	Million	18
Share of rural residents	%	45
GDP/person	$	9,030
Share of population living in extreme poverty (<1.90$/day)	%	0.04
Area of FOWL as % of total land	%	4.74
FOWL per inhabitant	ha	0.75

Source: World Bank 2017, FAO 2015, 2010, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

TRENDS FOR THE FOREST RESOURCE

Kazakhstan is considered a low forest cover country. Nevertheless, there is a wide variety of forest types in Kazakhstan, including desert and semi-desert saxaul, flood-based forests (river basin-based forest), thorn forest, steppe/forest steppe and mountain forests. Forests are distributed very unevenly (APFnet, 2017 A).

The area of the Forest Fund (area under the responsibility of forest authorities, although much of it does not have forest cover) is 29.4 million ha, just over 10% of the country's land area. Of this, 3.4 million ha are considered as "forest" by the international definition (crown cover over 10%) and 9.5 million ha "other wooded land", with crown cover between 5 and 10%, which includes notably the large areas of semi-desert saxaul forest. The total of "forest and other wooded land" (FOWL), or "land with forest cover" in the national terminology is 12.9 million ha. FOWL accounts for just under 5% of the total area of Kazakhstan, although forest, strictly defined, accounts for only 1.2%.

ANNEX TABLE 19:

Forest resources of Kazakhstan, 1988 and most recent.

		1998	2018
Area of forest	1,000 ha	3,161.7	3,397
Area of other wooded land	1,000 ha	7,112	9,507
Forest and other wooded land	1,000 ha	10,274	12,903
Average annual % change in area of forest and other wooded land, 1993-2018	%	-	1
Growing stock	Million m^3	361	422
Share of primary forest	%	-	-
Share of plantations for wood production	%	-	27.2
Share of publicly owned forest	%	100	100
Share of public forest managed by state forest agency/enterprise	%	100	22
Proportion of forest area under a long-term forest management plan	%	100	100
Area of certified forest	Ha	-	-
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	-	1.4

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Over the last 25 years, the average expansion of forest and other wooded land has been just over 1% a year. Over the same period, growing stock has increased by 60 million m^3. The main threats to the forests are as follows:

- ***natural***: forest fires, pests and diseases, floods and landslides, the consequences of global warming (reduction in moisture content of forest land, changes in the conditions of growth of individual forest species, and others).
- ***anthropogenic***: construction of roads and tourist infrastructure, expansion of agricultural land use and use of river flows for agriculture and the development of mineral resources, etc.
- the frequent ***structural*** changes of forest management bodies of the system, the lack of long-term national forest policy and the lack of stability of the legislation are also negative influences (APFnet, 2017 A).

All forest land is publicly owned, mostly through the Forest Fund (which also includes large areas of land without forest cover). Nevertheless, other approaches to ownership of forests are under consideration. In particular, there is a legal framework for private ownership of forests outside the State Forest Fund, through development of private afforestation, plantation and creation of private nurseries, which would develop agroforestry plantations and ribbon plantations on agricultural lands and other lands belonging to the state.

At present, the Private Forest Fund has 695 ha of land, but no tree cover yet.

The Committee on Forestry in the Ministry of Agriculture manages about 21% of the Forest Fund, and local authorities (akimats) 71%. The area of the Forest Fund for which the Committee is responsible is 6,427.5 thousand ha, of which the great majority (6,313.1 thousand ha) is specially protected natural territories with the status of a legal entity (hereinafter referred to as the SPNT), which include:

- 10 state natural protected areas (hereinafter referred to as SNPA) – 1,611.4 thousand ha.
- 11 state national natural parks (hereinafter - SNNP) – 2,395.3 thousand ha.
- 5 state natural reserves (hereinafter - SNR) – 2,306.4 thousand ha.

In addition, the Committee has subordinate agencies:

- State Enterprise "Republican Forest Selection Center" - 1.6 thousand ha.
- Sandyktau training and production forestry enterprise - 25.9 thousand ha.
- RSE "Zhasyl Aymak" - 86.9 thousand ha.

The oblast akimats are in charge of 120 state forestry institutions, the area of which is 22,664.7 thousand ha.

The Office of the President of the Republic of Kazakhstan is in charge of the Burabay Research and Production Association - 129.3 thousand ha.

The Ministry of Investment and Development of the Republic of Kazakhstan is in charge of the:

Protective stands along right of way of railroads Joint Stock Company National Company "Kazakhstan Temir Zholy"- 64.2 thousand ha.

- Protective stands on the roads "KazAvtoZhol" - 15.7 thousand ha.

No forest management unit in Kazakhstan is certified under FSC or PEFC. Currently government institutions are reviewing the issue of certification in forest management.

Wildfire is a significant problem in Kazakhstan, with nearly 10 million ha of land burned in some years, although only a small part of this is forests. The highest area of forest burnt in the last 10 years, according to the data from the Forestry & Wildlife Committee was 119.7 thousand ha in 2018 (mainly saxaul stands in Zhambyl region on the area of 117.1 thousand ha).

Major gaps in information on the forest resource: There is a regular report on the dynamics of the Forest Fund land (annual) and the account of Forest Fund land (once in 5 years). The report is carried out under the management of the Forestry and Wildlife Committee, by the Kazakh forest inventory enterprise. The methodology for conducting this work is based on methods developed and applied during the USSR period, and does not use sample plots.

Despite the existence of national forest accounts, the FRA 2015 data for Kazakhstan are based on a desk study (i.e. not transmitted and endorsed officially by the national authorities) and have many gaps. It is desirable that Kazakhstan discuss with FRA how data collected according to national definitions may be converted to the international definitions. In that way, forest data for Kazakhstan, collected at the national level, may be made available for the international community, notably for FRA 2020, but also for reporting on the SDGs and the United Nations Strategic Plan for Forests.

ANNEX FIGURE 9:

Burabay National Park. Kazakhstan.

Source: iStock.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

Wood harvest is reported at over 0.3 million m^3. Moreover, in recent years due to changes in national legislation the volume of illegal logging was reduced. The volume of illegal logging in Kazakhstan in 2017 was 0,03 million m^3.

The protection function is dominant for most forests in Kazakhstan which help to combat desertification and erosion. In many areas, final harvests and clearcuts are forbidden for this reason. In 2017 the area of clear cutting (final fellings) was 3.07 thousand ha. The main regions where clear cutting is legal are Akmoltyn, North-Kazakh, East Kazakh regions. Twenty percent of Kazakhstan's forest area is conserved for protection of biodiversity, with a range of different legal regimes.

ANNEX TABLE 20:

Goods and services provided by the forests of Kazakhstan, most recent period.

Recorded total harvest	1,000 m^3	340
Estimated total harvest, including non-recorded	1,000 m^3	371

Wood fuel production	1,000 m^3	238
Share of wood fuel in wood production	%	64.2
Share of forest area with a designated management objective to maintain and enhance its protective functions	%	100
Share of forest strictly conserved for protection of biodiversity	%	20
Main non-wood forest products and services	-	Hunting, collection of forest fruits, berries, nuts, mushrooms etc.
Employment in forestry, staff per thousand hectares	FTE/1,000 ha	3.3
Net GHG emissions (source)/ removals (sink) of forests per hectare of forest	tCO_2e/ha	-3.35

Source: FAO, 2016; UNFCC 2012, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Eleven thousand people are recorded as employed in forestry, of which seven thousand works in inspectorate (state forestry guards), which is a national average of over three people (FTE – full time equivalent) per thousand ha of forest.

Despite the difficult climatic conditions, the forests of Kazakhstan are a net carbon sink, with removals of CO_2 from the atmosphere of about 3.3 tCO_2e/ha. They perform this function alongside their other functions including climate regulation and soil and water protection.

Major gaps in information on goods and services provided by the forest: Priorities for data improvement as regards supply of goods and services would seem to be more information on supply of non-wood forest products and services, and a better understanding of the social dimension of sustainable forest management, including employment, livelihoods of forest dependent people, prices, income from sales of goods and services.

FOREST PRODUCTS MARKETS AND TRADE

Consumption of forest products in Kazakhstan is around 0.3 m^3 RE (roundwood equivalent) per head, higher than in other countries in the region, but considerably lower than in Europe, where the average is 0.8, reaching 2.6 in North Europe. Kazakhstan produces nearly a third of the forest products it consumes and imports the rest. Nearly 85% of imports come from the Russian Federation, in a partial reestablishment of pre-independence trade patterns.

ANNEX TABLE 21:

Production, trade and consumption of forest products in Kazakhstan, most recent period.

Production of sawnwood	1,000 m^3	232
Self-sufficiency in forest products	%	32.2
Consumption per head of forest products	m^3 RE/cap	0.3
Share of forest products imports from the Russian Federation	%	84.5

Source: FAO, 2016; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on forest products markets and trade: in view of the small size of the markets, data quality seems satisfactory.

POLICIES AND INSTITUTIONS

Kazakhstan has a two-tier system of forest management of the State Forest Fund (SFF): the republican (national) level and the local (regional) level. At the national level, the forests are managed by the Government of the Republic of Kazakhstan through its authorized central executive body - the Ministry of Agriculture. Direct control, economic control and supervision of the forests throughout the country are carried out by a specialized body - the Committee of Forestry and Wildlife, which is a part of the Ministry of Agriculture and its territorial departments. All the issues regarding the protection, restoration and use of land use of the SFF are within the competence of national authorities.

At the regional level, control is executed by the local executive bodies – regional akimats through their subordinate management of natural resources and environmental management and forestry institutions. 78% of the SFF is reserved for the executive bodies of the regions, 21% (mainly, specially protected natural regions -SPNA) is managed by the Committee of Forestry and Wildlife, and about 1% is under the jurisdiction of other ministries and departments (APFnet, 2017 A).

The Forest Code was approved in 2003, and has been updated, most recently in 2017. However, there is not yet a national strategic document for the sector for long and medium-term perspective. Some issues regarding afforestation are included in the strategic document of the Ministry of Agriculture, which is approved every 3 years.

Forest issues are not included in the highest-level strategy documents for the country as a whole but are covered in depth in the National Biodiversity Strategy and Action Plan.

MAJOR CHALLENGES FOR THE FOREST SECTOR

On the basis of the information presented above, as well as other sources, the following major challenges have been identified:

- There is no strategic document with a long term or medium-term perspective for forest sector.
- Deforestation and forest degradation due to natural and anthropogenic pressures.
- Big areas harmed by forest fires.
- The potential for increased self-sufficiency through afforestation and more intensive silviculture is not being achieved.
- Employees do not have good qualification and skills to accomplish tasks. Also, there is a lack of personnel for ensuring sustainable forest management.

DIRECTION OF FOREST SECTOR POLICY

As of October 2018, a new "concept program for the forest sector in economy "is under discussion, but the process is not yet complete.

It is reported that the main lines of the draft forest concept are:

- Reduce loss of forest area, and increase forest area.
- Develop the forest resource base by strengthening state support for afforestation and expansion of the private forest fund.
- Develop system of protected areas.
- More value added and vertical integration in the wood processing sector.

Targets may include:

- Preserve present forest area inside the State Forest Fund.
- Reduce areas damaged by pests and diseases by 50% (compared to 2017).
- Increase area planted including around settlements by about 280 thousand ha.
- Extension of privately-owned forests and nurseries.
- Reduce imports of panels by 50% (compared to 2017).

It is urgent to achieve consensus on a concept or strategy for the forest sector of Kazakhstan, and then to implement it, including with adequate funding for the measures proposed and for the institutions and staff involved.

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STATE FOREST RELATED INSTITUTIONS IN KAZAKHSTAN

In the Republic of Kazakhstan, the system of state institutions implementing state management of conservation, protection, use of the forest fund, forest reproduction and afforestation include:

- President of the Republic of Kazakhstan.
- Government of the Republic of Kazakhstan.
- authorized institutions (Ministry of Agriculture of the Republic of Kazakhstan), its department (Committee for Forestry and Wildlife) with their territorial divisions.
- local executive institutions (regional akimats).
- state forest institutions (*leskhoz*) and environmental organizations (specially protected natural territories).

As of 2002, state forest institutions have been transferred to akimats for operational management.

ANNEX TABLE 22:

State forest related institutions in Kazakhstan.

Responsibility for policy formulation	Ministry of Agriculture
Enforcement of policy, monitoring	Committee on Forestry and Wildlife (in Ministry of Agriculture)
Agency responsible for managing state forest fund	Local authorities (akimats) 78% of Fund area, Committee on Forestry and Wildlife 21% (mostly specially protected natural areas), "other" 1%
Total employees of state forest fund	11,000 people
Of which central/ local?	Government inspection is implemented by 14 oblasts' regional agencies of the Committee on Forests and Wildlife. Forestry is managed by: 120 state forest institutions -regional akimats, as well as 28 forest institutions of the Forestry and Wildlife Committee.
Sources of income of SFF: central budget, commercial, other	The Forest Code recognised the following sources of funding for forest management in the SFF: State budget (budget of Republic and local budgets). Revenue from paid services and sale of products from forest institutions. Forest users. Donations, voluntary contributions, including payment for ecosystem services of physical and legal entities. The state budget is the main source of financing, Funding for the Committee was: In 2016 – 15,715,778.0 thousand KZT tenge. In 2017– 17, 096,478.0 thousand KZT tenge. In 2018– 18,662,889.0 thousand KZT tenge, (about $43 million at 2018 exchange rates).
Local agencies/forest management units/*leskhoz*:	
Autonomous or centrally managed?	Forests under "long-term use" contracts are managed by enterprises (private) chosen through tender and paid from the national budget. They must follow the rules laid down by the Committee. Forest management in the Republic of Kazakhstan is state-owned; it is allowed to provide lots of the State Forest Fund for long-term use to entities and individuals.

Source: National expert. For more information about sources of data and methods of estimation visit the publication's website.

ANNEX 3.5 FORESTS AND FOREST SECTOR OVERVIEW: KYRGYZSTAN

By Kit Prins and Venera Surappaeva

CONTEXT

Kyrgyzstan is in the east of Central Asia, with a total area of nearly 20 million ha, and population just over 6 million, of whom nearly one million live in the capital, Bishkek. The country is very mountainous, with an economy dependent on agriculture[12], especially grazing. Two thirds of the inhabitants live in rural areas. It is classified as "middle income" by the World Bank, with GDP per person of nearly $1,220. About 1.3% of the population live in extreme poverty (defined as less than $1.90/day), although this share has fallen significantly over the last 25 years.

ANNEX FIGURE 10:

Map of Kyrgyzstan.

Source: United Nations Geospatial Information Section, 2011.

[12] According to one study (Undeland/Profor, 2012), 45% of the country is not suitable for human habitation, and only 6.55% is arable or otherwise suitable for farming

ANNEX TABLE 23:

Kyrgyzstan in context, around 2015.

Total area (incl. water)	Million ha	19.99
Population	Million	6.1
Share of rural residents	%	66.3
GDP/person	$	1,219.8
Share of population living in extreme poverty (<1.90$/day)	%	1.3
Forest cover	%	8.3
Forest per inhabitant	ha	0.21

Source: World Bank, FAO 2015, 2010, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Forest cover is rather low, 8.3%, partly due to the difficult climatic and physical conditions in mountainous areas, and partly due to the pressures on the forest which will be presented below. There is on average 0.21 ha of forest for each resident, which is significantly less than the European average (1.2 ha/person), but in the same range as central-West Europe, and other Central Asian countries.

TRENDS FOR THE FOREST RESOURCE

Traditionally there are four major forest types in Kyrgyzstan:

- Spruce forests, in the western and central areas, and the Fergana valley
- Walnut-fruit forests in the south
- Juniper forests in different parts of the country
- Riverside (tugai) forests

ANNEX TABLE 24:

Forest resources of Kyrgyzstan, 1988 and most recent.

		1988	Most recent
Area of forest	1,000 ha	728	1,252
Area of other wooded land	1,000 ha	289	411
Forest and other wooded land	1,000 ha	1,018	1,663
Average annual % change in forest	%	-	-
Growing stock	Million m^3	23	48
Share of primary forest	%	-	28
Share of plantations for wood production	%	-	-
Share of publicly owned forest	%	100	100
Share of public forest managed by state forest agency/enterprise	%	93.46	51.6
Proportion of forest area under a long-term forest management plan	%	100	61
Area of certified forest	Ha	-	-
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	-	0

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

The "most recent" data on forest in Kyrgyzstan are based on the results of the FAO project "National Forest Management Information System and Information System for a transparent and truthful REDD+", which was implemented in 2014-2016. The study concluded that there are 1,663 thousand ha of forest, according to the national definition, including 1252 thousand ha of "forest" (international definition) and 410 thousand ha of other wooded land. In the frame of this project, data collection was based on Google Earth space images.

Compared to the last USSR survey, in 1988, for the Kyrgyz SSR, this represents an increase of more than 60% for the area of forest and other wooded land. This apparent increase is due to several methodological reasons as the two data sets are not comparable:

- Since 1988, the methodology of forest inventory has changed, and now uses remote sensing.
- The first National Forest Inventory, which was carried out in 2008-2010, showed that forest is growing on all land categories, not only on the State Forest Fund and land of protected areas. The latter were the only areas inventoried under the USSR system, under which forests on other lands were not taken into account.

All forests are owned by the state. However, of the total area of forest and other wooded land (1.66 million ha), 900 thousand ha are under the operational management of the State Agency Environment Protected and Forestry (SAEPF). Another 700 thousand ha (outside the State Forest Fund) has not yet been transferred to any state organization: The Government of Kyrgyz Republic will decide to whom the management of this forest should be transferred, possibly to municipal organizations.

Over a longer time frame, data presented by Profor (Undeland/Profor, 2012) show that forest area nearly halved between the 1930s and the 1960s, when production of wood

was the official priority. However, forest area has increased steadily since then, as forests in Kyrgyzstan were managed for the protection they provide. This basic attitude of priority for protection functions is still at the heart of official approaches to forest policy. Nearly 30% is considered primary forest, but no plantations for wood production are reported. On average, there is about 70 m^3 of growing stock per hectare.

All forests are owned by the state, although management is typically in the hands of *leskhoz*, autonomous local enterprises, answering to the ministry and partly funded by it, but in most cases dependent on their own commercial activities for most of their revenue (Undeland/Profor, 2012). Lease arrangements are also in place for a few forests.

According to the forest legislation of Kyrgyzstan, all forests are subjected to a long-term management plan, which is updated every 10-15 year, according to forest type. Today the proportion of forest area under a long-term forest management plan is 60.8%. Those forests, which have not been transferred to any state organization yet, are not under a long-term forest management plan.

An FSC standard for sustainable forest management in Kyrgyzstan has been drawn up, but as yet no forest management unit has been certified.

Just over 0.02% of forest are considered disturbed by fire, insects or abiotic pressures (avalanches, landslides).

All forests in Kyrgyzstan are mountainous and according to the forest legislation of Kyrgyzstan, they play only an ecological function. So, all felling is forbidden, because of the forests' protection role, except for sanitation felling, and other silvicultural measures.

Major gaps in information on the forest resource: The forest inventory (SAEPF/FAO, 2010) with the more recent FAO survey now provides a good base point for analysis. The succession of two objective surveys in a few years indicates that monitoring of forest area is in hand. However, it would also be desirable to have an explicit calculation either of increment or annual allowable cut. Further information on forest management regimes (for instance area managed by *leskhoz*, area leased, community forest management) would be important input to the policy discussion.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

The forests of Kyrgyzstan provide a very wide range of goods and services, including wood, mostly for energy, nuts and berries for sale and auto-consumption, grazing for meat and dairy, shade and local climate control, water supply and protection against erosion, tourism etc. (SAEPF/FAO, 2010). Energy wood and livestock are the most important in terms of area of forest used. Protection is a designated management objective on nearly 70% of forests. 6.2% of forests are managed to conserve biodiversity.

ANNEX FIGURE 11:

Mountain forest in Kyrgyzstan.

Source: iStock.

ANNEX TABLE 25:

Goods and services provided by the forests of Kyrgyzstan, most recent period.

Recorded total harvest	1,000 m^3	18.1
Estimated total harvest, including non-recorded	1,000 m^3	18.1
Wood fuel production (recorded)	1,000 m^3	9.1
Share of wood fuel in wood production	%	50.3
Share of forest area with a designated management objective to maintain and enhance its protective functions	%	93
Share of forest strictly conserved for protection of biodiversity	%	6.2
Main non-wood forest products and services	-	Grazing (meat and dairy), nuts, berries, honey, medicinal herbs
Employment in forestry, per thousand hectares	FTE/1,000 ha	2.3
Net GHG emissions (source)/ removals (sink) of forests per hectare of forest (minus indicates a sink)	$ktCO_2e$/1,000 ha	-1.2

Source: FAO 2015, 2010, UNFCC, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Nearly 10,000 m^3 of fuelwood removals are recorded, but it is accepted that there are large volumes of unrecorded fuelwood removals, mostly by local communities, or by *leskhoz*, for sale, and that this is a significant pressure on the forest. The author was not able to find even a rough estimate of the volumes concerned.

Nearly 3,000 people (2,900 FTE - full time equivalent) are reported by FAO as employed in forestry in Kyrgyzstan, an average of just over 2.3 people per thousand hectares, which seems very low, especially in view of the absence of mechanised silviculture and harvesting. It may be that many "informal" workers, occupied with grazing, nut collection or fuelwood collection, are not recorded, especially if they are not salaried employees.

According to the national report submitted to UNFCCC, Kyrgyzstan forests are a GHG sink of over 800 thousand tons of carbon (CO_2 equivalent) every year, or 1,200 tons of CO_2 equivalent per thousand hectares.

Major gaps in information on goods and services provided by the forest: the most important information gap is a usable estimate of non-recorded wood removals, which is essential information to assess the sustainability of forest management in Kyrgyzstan. It would also be desirable to have more information on employment in the sector, including informal employment. Given the existence of extreme poverty in Kyrgyzstan and the UNFF commitment to eliminate extreme poverty in forest dependent people[13], it would also be desirable to assess the livelihoods of forest dependent people.

FOREST PRODUCTS MARKETS AND TRADE

Consumption of forest products is now at low levels in Kyrgyzstan (0.3 m^3 roundwood equivalent per head, as compared to 0.86 in Europe), and over 90% of this is imported. More than half of imports originate in the Russian Federation.

ANNEX TABLE 26:

Production, trade and consumption of forest products, most recent period.

Production of sawnwood	1,000 m^3	86
Self-sufficiency in forest products	%	7.3
Consumption per head of forest products	m^3 RE/cap	0.3
Share of forest products imports from the Russian Federation	%	53.6

Source: FAO, 2016; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

[13] (Undeland/Profor, 2012) reports that about 2.5 million people live in or near forests. Whether these are "forest dependent" is not clear. It also found that "About 80 percent of those interviewed in communities that neighbour forests depend on forest resources for their livelihoods."

Before independence, Kyrgyz needs for forest products were supplied almost entirely by other soviet republics. Indeed, final harvesting was forbidden as all Kyrgyz forests were classified as protected (Group 1).

Major gaps in information on forest products markets and trade: in view of the small size of the markets, data quality seems satisfactory.

POLICIES AND INSTITUTIONS

The national forest policy guarantees the sustainable development of forestry.

The beginning of the development of the new National Forest Policy is the Decree of the President of the Kyrgyz Republic "On the New National Forest Policy in the Republic" No. 300 of October 6, 1998.

From 1998 to 2017, forest policy went through several stages:

- The first stage coincided with the beginning of the formation of an independent sovereign state, when the principles of democratic governance were introduced. Considering the changes, the forest policy determined that the further development of forestry should proceed on the basis of strategic planning, carried out through the development of the Concept (long-term development vision) and the State Forest Program (short-term development vision).
- At the same time, strategic planning was carried out not only by the forest department of the country, but with the active participation of all stakeholders (government agencies, non-governmental organizations, the private sector and local communities), in which planning follows the bottom-up principle. Also, at this stage, the legal framework for forestry development was defined and the Forest Code was adopted.
- The second stage began in 2003 from the first assessment of the implementation of the Concept and the State Forest Program for 2001-2005, which made it possible to determine the effectiveness of achieving goals and effectiveness of the implementation of measures, on the basis of which recommendations were developed for introducing changes to the national forest policy. According to the results of this assessment, the perspective of the forest policy has changed; further development of forestry was based on long-term (Forestry Development Concept), medium-term (National Forest Program) and short-term (National Action Plan) visions.
- The emphasis on the protection functions of forests has continued strongly in policy and law throughout the past 20 years. Policy does not allow commercial activities to involve timber harvesting. Non-timber forest products are somewhat less regulated, but gathering these products is not supposed to contradict the basic principle of protecting trees. The felling of timber has been formally allowed

solely for sanitation purposes, such as for maintenance. In some forests, such as walnut forests, no felling is allowed whatsoever.

- The third stage began with an assessment of forest policy, in the period from 2015 to 2017. A detailed review and assessment of forest policy were carried out taking into account the ongoing changes at the global and national levels.

At this stage, at the global level, a number of important documents were signed by Kyrgyzstan:

1. In 2000, Kyrgyzstan ratified the United Nations Framework Convention on Climate Change (UNFCCC), which determined that forest is a priority both in adaptation and in mitigation of climate change.
2. According to the recommendations of the UN Convention to Combat Desertification (UNCCD), agroforestry is recognized as one of the areas that combat land degradation.
3. The UN Convention on Biological Diversity (CBD) has developed a Strategic Plan for the Conservation of Biodiversity for 2011-2020, based on the Aichi Targets (Nagoya Protocol).
4. In 2016, the Sustainable Development Goals, set out in the 2030 Agenda for Sustainable Development, adopted in September 2015 at the UN Summit, were adopted.

At the national level, the following changes occurred:

1. Kyrgyzstan became a parliamentary republic, and the Zhogorku Kenesh was given wide powers.
2. The National Sustainable Development Strategy for 2013-2017 was adopted: The Government of the Kyrgyz Republic made it obligatory to develop sectoral strategies and set the methodological framework for developing state strategic documents.
3. The National Development Strategy of the Kyrgyz Republic for 2018-2040 was adopted, in which one of the important tasks is sustainable management and conservation of forests.
4. Kyrgyzstan declared the preservation of mountain ecosystems, biodiversity and forests as priority directions for the country's climate actions at the 21st Conference of the Parties to the UNFCCC in Paris and at the 72nd session of the UN General Assembly in New York.

Forest policy assessment was conducted in two aspects of development:

1. Evaluation of documents for compliance with the country's sustainable development model, which was carried out in accordance with the Methodology for the assessment and inventory of state strategic documents, approved by the Ministry of Economy.
2. Assessment of the implementation of the strategic directions of the Concept of Forestry Development until 2025, approved by the Government of the Kyrgyz Republic.

Taking into account the results of the assessment and the changes that occurred at the global and national levels, the need to develop a new version of the Forest Sector Development Concept up to 2040 (hereinafter - the Concept) was identified.

The new Concept was also developed on a "bottom-up" basis, with the active participation of all stakeholders, and contains goals, objectives and strategic directions for the long-term and medium-term vision, as well as an Action Plan for the implementation of the Concept for 2019-2023.

The new Concept is based on the country's sustainable development model, so it includes three aspects of sustainability:

- Economic priorities of forestry development.
- Social priorities of forestry development.
- Ecological priorities of forestry development.

In contrast to the previous Concepts, for the first time in the strategic development of forestry until 2040, economic priorities, which are focused at increasing the potential of forestry to contribute to the development of the country's economy, are viewed independently. Forest resources can act as natural capital, which is considered as a combination of forest resources and ecosystem services.

Considering that the rural residents (62% of the population) live in forest areas, and their social position largely depends on forest resources, social priorities are aimed at developing joint forest management through rental relations and community forest management.

Environmental priorities are aimed at improving the ecological status of forests, as forests are of great ecological importance, especially in combating climate warming, while absorbing carbon. Forests are recognized as the most reliable natural system for mitigating the greenhouse effect.

According to the Constitution, all forests are strictly under state ownership and rights of forest management derive from the Government. That is why the State Agency of Environment Protection and Forestry (SAEPF) is an executive state agency of forest management. The lands of the State Forest Fund and the protected areas are under the operative control of the State Agency.

The institutional structure of forest management presents a vertical hierarchy, and the system of forestry has republic, regional and local levels.

Department of forest ecosystems and protected areas (republic level): its functions are forest management (control and monitoring of forest management).

The Department controls regional forestry institutes and forestry enterprises at lower levels.

Regional forestry institutes (regional level): their function is forest management (monitoring of forest management).

Forestry enterprises (local level): their function is the execution of arrangements of protection of forests from insects and illnesses, forest damages and fire, arrangements of forest reproduction (reforestation, afforestation), forest use regulation. The forestry enterprises were established in Soviet time. Forests are managed only by workers of forestry enterprises based on forest management projects and work plans. For example, the amount of planting forest and time for conduction of forest plantations are established by Department of forest management inventory. Based on this forestry enterprises make work plans for the achievement of goals.

Department of forest and hunting management inventory (republic level): its functions are provision of information, prognostication, planning and accounting of forests.

The Department carries out national inventory of forests and forest management inventory, forest monitoring, forest cadastre and forest fund accounting.

MAJOR CHALLENGES FOR THE FOREST SECTOR

On the basis of the information presented above, as well as other sources, the following major challenges have been identified:

- Forest degradation due to pressure from grazing and energy wood removals
- Potential to increase the areas protected by forests through afforestation
- Need to improve livelihoods of forest dependent people
- Improve forest sector governance, reduce corruption and illegal logging
- Improve effectiveness and efficiency of forest management, reduce bureaucracy, release individual and local initiative

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ANNEX TABLE 27:

State forest related institutions in Kyrgyzstan.

Responsibility for policy formulation	State Agency for Environmental Protection and Forestry (SAEPF)
Enforcement of policy, monitoring	Department of Forest Ecosystems Development, under SAEPF. However, The SAEPF lacks sufficient resources to carry out hands-on oversight of its subordinate entities or to develop policy, leaving substantial discretion to *leskhoz*. The separation of productive (i.e., economic utilization) and regulatory functions in forestry management has not been implemented.
Agency responsible for managing state forest fund	*Leskhoz* at local level, with oversight from the Department of Forest Ecosystems Development
Total employees of state forest fund	Forestry employees make up more than half of the 2,700 staff members of SAEPF (i.e. about 1,900 staff)
Of which central/ local?	Central – 70 staff. Regional – 50 staff. Local – 1,780 staff.
Sources of income of SFF: central budget, commercial, other	The total annual budget for salaries and all other operational costs of the SAEPF and its subordinate agencies and park management currently stands at approximately US$4 million
Local agencies/forest management units/*leskhoz*:	
Autonomous or centrally managed?	The *leskhoz* should implement the centrally prepared management plans, but in practice, they do what they can with the (very limited) resources available to them
How many units?	48
How many staff?	1780
Sources of finance for local units: budget or commercial enterprise?	According the new Budget Code all finance income from lease arrangements is transferred to the state budget. So *leskhoz* budgets are now funded by the state on the basis of the Budget Programme, as well as by grant allocations from environmental user fees that are pooled at territorial levels
Other agencies who manage publicly owned forests	700 thousand ha of forest outside the Forest Fund has not yet been transferred to any state organization, but now activities on national forest management inventory have been carried out, and the Government of Kyrgyz Republic will decide the issue of transferring management to any organization. This may be municipal organization
Any discussion of other tenure forms (leasing, community forestry, privatisation etc)?	A model of community-based forestry management has been developed with substantial donor support and is set forth in government regulations; however, the governance and de facto management arrangements under this approach essentially involve a form of leasing to individual households, with responsibility for planning and oversight of the forest as a whole retained by the same *leskhoz* management that is charged with forest preservation.

Source: National expert. For more information about sources of data and methods of estimation visit the publication's website.

ANNEX 3.6 FORESTS AND FOREST SECTOR OVERVIEW: TAJIKISTAN

By Kit Prins and Hukmatullo Ahmadov

CONTEXT

Tajikistan is a landlocked mountainous country in Central Asia. Over 90 percent of the country is mountainous, more than 60% of which rise 2,500 m above sea level and represent a highly vulnerable ecosystem. Because of its geographical location, physical features and specific climate, Tajikistan is prone to frequent natural disasters, including earthquakes, floods, mudflows, landslides, avalanches, droughts and epidemics. (Hessen Forst, 2010). Major rivers of the region rise in the glaciers of Tajikistan.

ANNEX FIGURE 12:

Map of Tajikistan.

Source: United Nations Geospatial Information Section, 2009.

ANNEX TABLE 28:

Tajikistan in context, 2018.

Total area (incl. water)	Million ha	14.1
Population	Million	8.9
Share of rural residents	%	73.4
GDP/person	$	801
Share of population living in extreme poverty (<1.90$/day)	%	19.5
Forest cover	%	2.9
Forest per inhabitant	ha	0.05

Source: FAO 2015, 2010, World Bank 2017, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

It is considered "low income" by the World Bank, with slightly more than $800/person of GDP. According to the World Bank, nearly 20% of people in Tajikistan live in extreme poverty, defined as less than $1.90/day. Nearly half of GDP comes from remittances from citizens working abroad. Nearly three quarters of the population live in rural areas. Seventy five percent of these depend on the production of cotton although horticulture is being developed (150,000 ha, plus 37,800 ha of vines) and cotton's share of GDP is falling. Agriculture makes a greater contribution to GDP than industry.

Forest cover is below 3%, and there are only 0.05 ha of forest for each resident, considerably less than for other countries in the region. It is estimated that some 10-20 percent of the country's population depends on firewood, a smaller proportion than before (when it reached 70%) as hydropower is developed.

TRENDS FOR THE FOREST RESOURCE

There has been no national forest inventory since independence, and the data are based on partial "forest accounts" compiled by forest managers, supplemented by projections and estimates as data over time are probably not comparable, it is not possible to analyse trends in the area of the forest resource of Tajikistan. Growing stock per hectare is only about 5 m^3/ha, another indicator of the degraded and vulnerable state of the forests of Tajikistan.

Over the long term, it appears that forest cover of Tajikistan was around 25% in the nineteenth century, but that this fell because of increasing population, fuelwood demand, and, in the twentieth century, removal of lowland forests to make space for cotton. According to literary sources, in the 1950s and 1960s, the total area of pistachio was 115 thousand ha, (currently 78 thousand ha), and tugai forests were about one million hectares. The best lands were cleared and are now occupied by technical crops. However, in the 1930s – 1960s, the forest area was significantly larger than at present. Until 1956, final and selective logging of forests was officially permitted in the forests of Tajikistan, but after 1956, logging on the territory of Tajikistan was prohibited and all forests were transferred to Group 1 - soil and water protection. Grazing pressure also reduced forest area and quality. The civil war in Tajikistan in the 1990s also harmed the forest resource, as well as the sudden stop to energy supplies from the Russian Federation which occurred when the USSR collapsed, leaving wood (and dung) the only possible fuel for rural families. At present, it appears that the main factors in deforestation are illegal cutting, notably for fuelwood, and overgrazing.

Over 70% of forests are reported as "primary", but it is clear that even the least intensively managed forests in Tajikistan have been influenced by human activities, such as grazing and fuelwood harvesting. There are no plantations for wood production, although in the 1970s and 1980s, a quarter of forests were classified as production forests. All forest is publicly owned. Nevertheless, it appears that the management planning system in force in the USSR has been allowed to fade, and nothing has taken its place, leaving the *leskhoz* to manage as they can (Hessen Forst, 2010).

There is no forest certification in Tajikistan.

There are certainly disturbances from fires, insects and disease, but no system is in place to monitor the extent of these disturbances. However, the damages are considered not significant, so that it would not be justified to put in place a monitoring system.

ANNEX TABLE 29:

Forest resources of Tajikistan, 1988 and most recent.

		1988	Most recent
Area of forest	1,000 ha	410.1	421
Area of other wooded land	1,000 ha	325.4	142
Forest and other wooded land	1,000 ha	735.5	563
Average annual % change in forest area	%	-	0.02
Growing stock	Million m^3	5.6	5.1
Share of primary forest	%	-	70.5
Share of plantations for wood production	%	-	None
Share of publicly owned forest	%	100	100

Share of public forest managed by state forest agency/enterprise	%	-	97.1
Proportion of forest area under a long-term forest management plan	%	100	100
Area of certified forest	Ha	0	0
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	0.01	0.01

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on the forest resource: At present there is no reliable information base on which to base forest policy in Tajikistan. The overwhelming priority must therefore be to carry out a modern forest inventory, so that the major problems can be demonstrated and quantified. This should put the Tajikistan authorities in a position to develop an evidence-based forest policy and to fulfil their international reporting commitments under the SDGs and the United Nations Strategic Plan for Forests.

ANNEX FIGURE 13:

Nurek Reservoir near Dushanbe in Tajikistan.

Source: iStock.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

Recorded wood removals were under 10,000 m^3, but it is acknowledged that the real level is much higher, perhaps ten times higher to give a total of 70-90 thousand m^3. Almost all wood removals are for fuelwood in rural areas, where there are few affordable alternative energy sources.

ANNEX TABLE 30:

Goods and services provided by the forests of Tajikistan, most recent period.

Recorded total harvest	1,000 m^3	7-9
Estimated total harvest, including non-recorded	1,000 m^3	70-90
Wood fuel production	1,000 m^3	70-90
Share of wood fuel in wood production	%	100
Share of forest area with a designated management objective to maintain and enhance its protective functions	%	73.3
Share of forest strictly conserved for protection of biodiversity	%	26.7
Main non-wood forest products and services	-	Game and fur animals, seeds, nuts, berries, mushrooms, oils, foliage, medicinal plants, peat, honey, seedlings.
Employment in forestry, staff per hectare	FTE/1,000 ha	4.9
Net GHG emissions (source)/ removals (sink) of forests per hectare of forest	tCO_2e/ha	-1.49

Source: FAO 2015, 2010, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Non-wood products are very important to the local population. In particular the survival of state-owned forest enterprises (SFE, or *leskhoz*) depends on non-wood products, such as nuts and berries, game etc. In other words, the *leskhoz* in Tajikistan rely on the harvesting and sale of non-wood products to survive financially since their operational budgets are minimal. Of particular importance for some SFEs is the production of fruit trees (Hessen Forst, 2010).

All forests in Tajikistan have a protection function, which is recognised in the Forest Code, which forbids all commercial harvests. However, this role is only formally designated for about three quarters of the forests.

Over a quarter of forests in Tajikistan are protected for the conservation of biodiversity.

It is reported that there are fewer than five workers for each 1,000 ha of forest, which is rather low, especially as many *leskhoz* lack even the most basic equipment including vehicles and computers (Hessen Forst, 2010).

It has been shown however that it is possible to raise the amount of wood, non-timber products and protection services, on a sustainable basis, and improving livelihoods, notably by better tenure rules, and Joint Forest Management (Hessen Forst, 2010).

It is reported that the forests of Tajikistan on average sequester nearly 1.5 tCO_2e/ha of carbon, a low figure which corresponds to the low growing stock and difficult growing conditions of most stands.

Major gaps in information on goods and services provided by the forest: To assess the pressures on the forests, a reliable estimate of illegal/unreported removals (preferably by type and location, with some consideration of the driving forces) is highly necessary. Further investigation is also needed of the actual and potential supply of non-wood products, as well as of revenues/livelihoods from these products, both for auto-consumption and for sale.

FOREST PRODUCTS MARKETS AND TRADE

Before independence, Tajikistan produced some furniture, but since the 1990s, the domestic wood-using industry is no longer active, chiefly because of lack of access to raw material, so that all forest products must be imported, at market prices (Akhmadov, 2008). As would be expected, per capita consumption of forest products is low – 0.2 m^3RE/cap. Almost all imports of forest products come from the Russian Federation.

ANNEX TABLE 31:

Production, trade and consumption of forest products in Tajikistan, most recent period.

Production of sawnwood	1,000 m^3	0
Self-sufficiency in forest products	%	0
Consumption per head of forest products	m3RE/cap	0.2
Share of forest products imports from the Russian Federation	%	99.5

Major gaps in information on forest products markets and trade: Given the small size of the local forest products sector, information may be considered adequate for the needs.

Source: FAO, 2016; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

POLICIES AND INSTITUTIONS

The main legal framework for forest management in Tajikistan is the Forestry Code of the Republic of Tajikistan approved by the Chairman of the Supreme Soviet of the Republic of Tajikistan. In 2003, the Government initiated a complete revision of this law, which was completed in 2011.

Most forest is under the responsibility of the Forestry Agency directly answering to the Government of the Republic. The Agency fixes national policy and targets and provides technical advice. However, management on the ground is in the hands of *leskhoz*, local forest management enterprises, guided by the Forestry Agency, who receive very small funds and equipment from the central budget but are expected to cover their costs by selling their produce. In fact, commercial fellings are forbidden in almost all forests, because of the protection functions of the forest, so most of the revenue of the *leskhoz* comes from non-wood forest products, such as nuts and berries, as well as fruit tree seedlings (Hessen Forst, 2010).

The National Forestry Program 2006-2015 was formulated in 2005 with such key players as the *leskhoz* staff in Dushanbe, the FAO and the relevant ministries in Dushanbe. This document should have served as the basis for Tajikistan's future engagements in forestry, but so far many of the recommendations have not been implemented.

According to one study (Hessen Forst, 2010), there is a major issue of the capacity of the *leskhoz* to carry out their functions, because they are not adequately equipped (with staff, budget, expertise or technology) to implement sustainable forest management schemes. Furthermore, although management decisions at the local level are delegated to *leskhoz*, their existing hierarchy, leadership and organizational structure make it difficult to implement proactive and independent decision-making at the level of the individual *leskhoz* (Hessen Forst, 2010).

MAJOR CHALLENGES FOR THE FOREST SECTOR

The main factors that cause forest degradation and destruction are illegal timber cutting and intensive grazing. Other factors are open access to forests, high fuelwood demand and lack of alternative fuels, exacerbated by the use of inefficient stoves, unclear legal framework regarding responsibilities and jurisdiction, lack of data on which to base policy, weak law enforcement capacity. The issues of fuelwood demand and overgrazing recur often, and lead to illegal logging. These issues are addressed in the latest Forest Law of 2011.

DIRECTION OF FOREST SECTOR POLICY

At the highest policy level, there are two passing references to forest questions in the National Development Strategy 2030, but no mention of forests in the Strategy's benchmarks. However, forest questions are well covered in the Poverty Reduction Strategy of 2010 (Tajikistan, 2010), which under the heading of climate change calls for "Rehabilitating mountainous, river banks and desert forests to strengthen foothills and stabilize the water flow process". The goal is to "establish sustainable development principles by halting forestry degradation by 0.3%, expand forested areas, improve

the protected areas by 0.6% and decrease land degradation by 1.5%".

At the level of the forest sector, the National Forestry Programme lays out specific priorities, which may be summarized as follows:

- forest management is mostly concerned with the protective functions of forests and notably excludes timber extraction,
- harvesting and processing of non-timber forest products is emphasized and explicitly permitted,
- reference is made to the new forestry code that is still pending and its respective by-laws (which are still to be drafted),
- leasing contracts with private persons and organizations are expressly permitted,
- the CEP is named as the agency in charge of forestry nationwide and
- the establishment of some 150,000 ha of industrial forest plantations is envisaged to meet the country's future demand for timber (Hessen Forst, 2010).

However, the NFP was drafted without consideration of the availability of resources, and some of the objectives, such as the goal of 150,000 ha of industrial forest plantations appear unrealistic as resources were not made available.

It is perhaps surprising, in view of the importance of energy supply for rural population, that energy supply, as well as integrating grazing and forestry policies are not more visible in the NFP.

However, the NFP covers the period to 2015, and appears not to have been implemented or financed, and the Forest Code has not yet been approved.

It appears therefore that the way towards sustainable forest management in Tajikistan goes through funding and implementing the strategic directions already discussed and improving the capacity of the forest sector institutions to fulfil their tasks. These measures would be beneficial not only for the forests of Tajikistan, but also for rural livelihoods and employment, reducing extreme poverty of forest dependent people, improving rural energy supply, limiting erosion and contributing to climate change mitigation.

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ANNEX TABLE 32:

State forest related institutions in Tajikistan.

Responsibility for policy formulation	The State Forestry Agency which is directly under the Government of Tajikistan has overall responsibility for Tajikistan's state forest resources.
Enforcement of policy, monitoring	District forest enterprises (*leskhoz*), under the Forestry Agency.
Agency responsible for managing state forest fund	District forest enterprises (*leskhoz*). District-level *leskhoz*, responsible for forest management and protection, operate on state-owned land that has been assigned to them. The *leskhoz* are the technical authorities that have sovereign functions (e.g. enforcement of the Forest Law), while at the same time, they must manage forests in Tajikistan (and act as entrepreneurs).
Total employees of state forest fund	4000 temporary and contractual employees. Permanent staff is 1384.
Of which central/ local?	41/1,343
Sources of income of SFF: central budget, commercial, other	Central budget, supply of non-wood products, for instance livestock, horticultural products, beekeeping, agricultural products.
Local agencies/forest management units/ *leskhoz*:	
Autonomous or centrally managed?	The *leskhoz* (forestry enterprise) receives requests for annual quotas for fuelwood harvesting for schools, hospitals, the army and other public institutions. It also receives a reforestation plan. The Agency allocates very few financial resources to the *leskhoz*. The *leskhoz* are controlled by the Forestry Agency under the Government of the Republic of Tajikistan.
How many units?	41 *leskhoz*, 5 tree nurseries, 4 reserves, 1 national park, 2 natural parks and 13 nature reserves.
How many staff?	Between 16 and 23 staff members are assigned to each *Leskhoz*.
Sources of finance for local units: budget or commercial enterprise?	In general, the Agency staff is approaching retirement age, with relatively few junior members. Working for the Agency does not appeal to the younger generation, probably because of the low salaries - which means that the Agency is not able to attract new, highly qualified staff. However, in recent times, the number of young specialists from the number of graduates of TAU (Department of Forestry) has increased and in some *leskhoz*, the number of young specialists reaches 70% of the total number working in the *leskhoz*.
Other agencies who manage publicly owned forests	Two institutions also manage state-owned forests: State Administration of Protected Areas; Scientific Research Institute of Forestry (together with the Academy of Sciences).
Any discussion of other tenure forms (leasing, community forestry, privatisation etc)?	Not observed.

Source: National expert. For more information about sources of data and methods of estimation visit the publication's website.

ANNEX 3.7 FORESTS AND FOREST SECTOR OVERVIEW: TURKMENISTAN

By Kit Prins, Muhammet Durikov and Nury Atamuradov

CONTEXT

Turkmenistan is a landlocked country in Central Asia, bordering the Caspian Sea[14] to the west. The Karakum Desert covers about 80% of its land area (UNECE, 2012), with a mountainous region to the south. Turkmenistan has substantial oil and gas resources.

ANNEX FIGURE 14:

Map of Turkmenistan.

Source: United Nations Geospatial Information Section, 2004, modified by Durikov M. and Atamuradov N.

[14] "Landlocked" is defined as entirely enclosed by land, or whose only coastlines lie on closed seas, such as the Caspian Sea.

ANNEX TABLE 33:

Turkmenistan in context, around 2015.

Total area (incl. water)	Million ha	48.8
Population	Million	5.7
Share of rural residents	%	47.7
GDP/person	$	6,586
Share of population living in extreme poverty (<1.90$/day)	%	-
Forest cover	%	8.7
Forest per inhabitant	ha	0.75

Source: FAO 2015, 2010, World Bank 2017, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

With GPD per person over $6,500, it is considered "middle income" by the World Bank. No recent data are available on extreme poverty, but twenty years ago, in 1998, the World Bank reported that 42% of the population lived in extreme poverty (defined as less than $1.90/day).

Nearly half the population live in rural areas, and agriculture accounts for rather more than 10% of GDP. In Turkmenistan, agriculture is mostly dependent on irrigation, and produces cotton and wheat. The inefficiency of irrigation systems in Turkmenistan and neighbouring countries, has contributed to the gradual shrinking of the Aral Sea, and major desertification in Central Asia.

Turkmenistan reports 8.7% forest cover, equivalent to 0.7 ha/resident, higher than the regional average.

TRENDS FOR THE FOREST RESOURCE

Since 1988, no comprehensive forest inventory has been carried out due to the lack of specialized enterprises. However, since 2013, forest inventories have been carried out in individual administrative and territorial units with province-wide powers (velayats) by the Ministry of Agriculture and Environment Protection of Turkmenistan in the framework of the National Forest Programme. According to the National Forestry Program of Turkmenistan (2013-2020) a national forest inventory is foreseen. This inventory started in 2014 and is still in process. It is expected to be completed by the end of 2019. In the meantime, the area of forest and other wooded land is estimated at 4.26 million ha.

Despite its relatively small area of forest cover, Turkmenistan has specific forest characteristics and supports a diverse range of forest and woodland types, some of them unique to the region. The climate is hot with very little precipitation. The three main forest types are: mountainous or hilly, desert and ***tugai*** forests. Mountain forests occupy a total area of about 146,200 ha. They are rich in wood species, such as juniper (*Juniperus turcomanica*), which is, a tree characterized by its ability to grow in the most extreme conditions. However, extension of juniper forests is limited by the difficulty of growing planting material. In this regard, high hopes are pinned on the development of international and regional cooperation. The vegetation of sandy desert territories of Turkmenistan is typically xerophilous with wide endemic diversity of species. Most of this territory in sandy or desert areas, up to 3.95 million ha in all, is covered with saxaul, cherkez and kandym. *Tugai* forests are mainly found in river valleys, and cover strips 50-500 m wide along the major rivers. The key forest-forming species are poplar, "loch" (*Elaeagnus*), willow, tamarisk and others. At present, the overall area of *tugai* forests in Turkmenistan is 26.2 thousand ha, not including the territory of the Amu Darya State Reserve (5,000 ha) (UNECE, 2012). Much of the sparse saxaul forests is "forest" according to the national definition but would probably be classified "other wooded land" under the international definitions.

FRA 2015 reported growing stock of 14.5 million m^3, which is 3.4 m^3/ha, reflecting the prevalence of sparse and xerophytic forests.

2.4% of forest is reported as primary forest and is situated in protected nature reserves. There have been plantation efforts, but they have focused on the protection functions, rather than wood production.

All forest land is publicly owned. The State Forest Fund (SFF) covers some 9.8 million ha. A significant part of the State Forest Fund is used for agricultural purposes, mostly pasture (UNECE, 2012) .

It is reported that 100% of forests are covered by long term forest management plans in Turkmenistan.

No forest land has been certified, either for PEFC or FSC, and the author is not aware of any forest management standard for certification purposes n Turkmenistan.

It is reported that there is no forest disturbance in Turkmenistan.

ANNEX TABLE 34:

Forest resources of Turkmenistan, 1988 and most recent.

		1988	Most recent
Area of forest	1,000 ha	4,127	4,264
Area of other wooded land	1,000 ha	4,242	0
Forest and other wooded land	1,000 ha	8,369.5	4,264
Average annual % change in forest area	%	-	01

Growing stock	Million m^3	13.7	14.5
Share of primary forest	%	-	2.4
Share of plantations for wood production	%	-	0
Share of publicly owned forest	%	100	100
Share of public forest managed by state forest agency/enterprise	%	-	100
Proportion of forest area under a long-term forest management plan	%	100	100
Area of certified forest	Ha	0	0
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	-	0

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on the forest resource: At present, no data presented on the forest is based on any objective recent scientific measurement, although a national forest inventory is scheduled to be completed in 2019, which should provide a basis for formulation of forest policy, as well as Turkmenistan's international reporting commitments, notably under the SDGs and the monitoring of the United Nations Strategic Plan for Forests.

ANNEX FIGURE 15:

Mountain forest in Turkmenistan.

Source: iStock.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

In line with the 2011 Forest Code, all forests in Turkmenistan are classified as "Category 1" and are therefore exclusively used for protective functions. This is why final cuts are not allowed and are not implemented (UNECE, 2012). It is estimated that a maximum of 10,000 m^3 of wood is removed through sanitary fellings.

ANNEX TABLE 35:

Goods and services provided by the forests of Turkmenistan, most recent period.

Recorded total harvest	1,000 m^3	10
Estimated total harvest, including non-recorded	1,000 m^3	10
Wood fuel production	1,000 m^3	10
Share of wood fuel in wood production	%	100
Share of forest area with a designated management objective to maintain and enhance its protective functions	%	100
Share of forest strictly conserved for protection of biodiversity	%	2.4
Main non-wood forest products and services	-	Nuts (pistachio, walnut), berries, fruit, medical herbs, hay, seedlings
Employment in forestry, staff per hectare	FTE/1,000 ha	0.35
Net GHG emissions (source)/ removals (sink) of forests per hectare of forest	tCO_2e/ha	-0.20

Source: FAO 2015, 2010, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

A programme providing natural gas free to all settlements has reduced pressure on forest resources for cooking and heating. The widespread use of free natural gas in ordinary households has led to a reduction in illegal logging. Restrictions have been placed on the grazing of livestock in places where this might have a negative impact on the growth and development of forests, particularly young trees and bushes (UNECE, 2012).

There are artificially established forests on mountainous, sandy and irrigated areas within the territory of the SFF, field protection forests and pasture protection forests. Continuous sowing and planting have resulted in 680,000 ha of woods and pasture-protection forests (UNECE, 2012).

The need for recreational forests increases every year. Currently, there are only 5,700 ha of sanitary zones and recreational forests in the country (UNECE, 2012).

The lack of appropriate funding and of qualified specialists precludes proper forest and ecological monitoring, which would make it possible to evaluate the status and dynamics of forests and OWL, as well as evidence-based planning of forest management for the future (UNECE, 2012).

1500 people (FTE – full time equivalent) are estimated to work in forestry in Turkmenistan or about 0.3 FTE for a thousand hectares of forest, which seems very low, even in the sparse desert conditions of the saxaul areas.

According to the national report to UNFCCC on the greenhouse gas balance of Turkmenistan, Turkmenistan's forests sequester on average 0.2 tCO_2 e/ha. This low estimate is consistent with the harsh growing conditions and low growing stock of most Turkmenistan forests. However, it should be borne in mind that these estimates of carbon sequestration, prepared according to the UNFCCC guidelines for GHG balances, ultimately depend on forest inventory data dating back to 1988, and may therefore be significantly distorted.

Major gaps in information on goods and services provided by the forest: Although it appears that the volumes removed are small, this estimate is not based on any reliable survey or monitoring system. It is desirable therefore to ascertain (or provide a reliable estimate) how much wood is removed from the forests of Turkmenistan, of what assortments, and for what purposes (fuelwood, local domestic and agricultural uses etc.). It would also be desirable to have information about livelihoods of forest dependent people, as well as employment in forestry, both of which are important for the social aspect of sustainable forest management and, above all, to present the social benefits of decisions on forest policy for higher level policy makers.

FOREST PRODUCTS MARKETS AND TRADE

Consumption of forest products per head is extremely low in Turkmenistan (0.1 m^3RE /cap.), and there is now no local production at all. All forest products must be imported: forty percent come from Turkey and a third from the Russian Federation.

ANNEX TABLE 36:

Production, trade and consumption of forest products in Turkmenistan, most recent period.

Production of sawnwood	1,000 m^3	0
Self-sufficiency in forest products	%	0
Consumption per head of forest products	m^3 RE/cap	0.1
Share of forest products imports from the Russian Federation	%	100

Source: FAO, 2016; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on forest products markets and trade: Given the very small size of the market, improving data quality does not seem to be a priority.

POLICIES AND INSTITUTIONS

The main governmental institution responsible for forestry, forestry-related activities and forest management is the Ministry of Agriculture and Environment Protection of Turkmenistan and its subordinate bodies, the Department of Forestry and the Service for Forest-Seed Farming and Natural Parks Protection. The Department of Forestry consists of four departments: forestry, agriculture (presumably agricultural activities on State Forest Fund lands), mechanization and finance. Under the current structure, the key role in forest management is played by the Department of Forestry and its 7 forest enterprises, whose activities on the ground are implemented under the Department of Forestry's supervision. The Department of Forestry realizes and coordinates all actions in the sphere of rational forest management, organization of forest nurseries, forest planting and growing, and the planting of other greenery (UNECE, 2012). Forest managers are trained in the Agricultural University of Turkmenistan.

Some ministries have formed their own forestry units to deal with tree planting. For example, the forestry unit for oil and gas employs some 600 forest related workers (UNECE, 2012).

The new Forest Code, which was adopted by the Parliament in April 2011 and came into force in July 2011, defines the responsibilities of State bodies in terms of forestry and forest management. This will provide an important basis and a good start for better coordination of works and activities aimed at sustainable forest management, if training and capacity-building is consistent with the requirements of the new Forest Code (UNECE, 2012).

The number of governmental decisions and/or resolutions and programmes indicate that measures are being taken aimed at the protection of forests, afforestation and reforestation (UNECE, 2012).

The following actions have been taken in favour of sustainable forest management:

- In 1998, a national program was launched to create forest-park zones around cities, mass planting of various forest species throughout the country in various landscapes. Several tens of millions of trees and shrubs were planted around the capital and in the velayats (3 million trees are planted every year).
- In 2011, together with international experts (GIZ, UNDP), a new Forest Code of Turkmenistan was prepared and adopted in compliance with international standards and norms.
- In January 2013, the National Forest Program (NFP) of Turkmenistan was adopted, which provides for ways to develop the country's forest industry until 2020. The main task of NFP is the conservation and rational use of forests and thereby ensure the further development of sustainable forest management. There are plans to expand

work on gardening and create optimal environmental conditions in the country, especially on the Caspian Sea coast in the Avaza National Tourist Zone, forest-growing in the north of the country in the Aral Sea influence zone, the development of nurseries to grow planting material on modern technologies.

MAJOR CHALLENGES FOR THE FOREST SECTOR

The following major challenges were identified by the UNECE Environmental Performance Review, which was approved by the Turkmenistan Government and reviewed by the UNECE Committee on Environmental Policy (UNECE, 2012):

- The natural forests are subject to heavy degradation due to overgrazing and climate change.
- Low incomes limit people's ability to purchase commercialized wood products, and alternative timber production (from poplar plantations) is not yet sufficient to cover needs.
- Some communities have no access to alternative energy sources and depend entirely on fuelwood, although the State programme of providing gas to settlements has been successfully implemented. The energy efficiency of households is low. Insufficient insulation of buildings increases fuel consumption considerably. There is no strategy for promoting the use of alternative energy sources.
- The technical equipment of forestry departments is insufficient. The lack of transport and communication vehicles results in poor guarding of forest territories.
- Forestry organizations are self-financed, and this has proved to be a crucial negative factor as it slows down the development of forestry. However, forest protection in natural parks is fully financed from the state budget.
- Nonetheless, forest parks have been developed in recent years.

DIRECTION OF FOREST SECTOR POLICY

The principal objectives and trends in the current forest policy, which is mostly based on forest-related legislation, can be summarized as follows:

- Effectively protecting existing forests, OWL and woody vegetation.
- Restoring degraded wooded areas through the use of current silvicultural methods, and protection of biodiversity.
- Planting trees for many different purposes all over the country, with the aim of extending areas covered by forests.
- Ensuring that State, commercial, public and other bodies, as well as local authorities, participate in the organization of and technical support for tree planting; they are encouraged to take measures to ensure that newly planted trees take root, show good vitality and are properly maintained.
- Improving methods of operating forest nurseries, raising quality and productivity in the cultivation of seedlings and saplings, in both nurseries and arboreta.
- Raising public awareness and improving State education and practical training with regard to sustainable management of forest resources.
- Promoting forestry-related institutions and the professional development of their personnel.
- Encouraging the participation of institutions and organizations, particularly those engaged in forestry issues, in the relevant international programmes and projects (UNECE, 2012).

The measures undertaken by the Government so far have not yet been sufficient to raise the forestry profile to the level of genuine sustainable forest management. The author was unable to find any reference to forest issues in a higher-level national development strategy or poverty reduction strategy for Turkmenistan.

However, the national climate change strategy does incorporate a forest dimension, including the following:

- Improvement of the forestry inventory system.
- Improving the mechanism of economic incentives.
- Integrating biodiversity management objectives into economic sector activities to precipitate the support of natural ecosystem functions by industrial processes.
- Enhancing the economic potential of protected areas through implementing reforms in the protected areas system, expanding the total surface area of protected spaces, development of national parks and introduction of alternative sustainable financing arrangements.
- Integration of principles that enhance ecosystems' sustainability and rational use of land and water resources in the key sectors of the economy that cause adverse effects for the environment. These include fuel and energy complex transport, construction, etc.
- Applying legislative, economic, institutional and technical measures for expanding the forest coverage (Government of Turkmenistan, 2012).

There appears to be consensus on the broad lines to be followed: elaborate a coherent forest policy system and a properly coordinated, legal, institutional and financial framework, build on the 2011 Forest Code, and the 2013 National Forest programme, radically improve the information base, protect existing forests, extend forest area where possible, improve the capacity of forest institutions to carry out their tasks, increase public and government awareness, integrate forest policy with policies for environment and agriculture. The first steps have been taken, but high-level

political will, and considerably increased resources will be necessary to achieve the goals.

The national expert considers it is advisable to expand international cooperation in forestry in the following areas:

- Exchange of experience on new technologies of afforestation, protection of forests from fires, diseases and pests.
- Further improvement of forest legislation.
- Improving the methods of growing planting material, especially with a closed root system.
- Carrying out selection work of the main forest-forming species.
- Training and professional development.

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ANNEX TABLE 37:

State forest related institutions in Turkmenistan.

Responsibility for policy formulation	Majlis (Parliament) of Turkmenistan, Cabinet of Ministers of Turkmenistan, Ministry of Agriculture and Environment Protection of Turkmenistan
Enforcement of policy, monitoring	Ministry of Agriculture and Environment Protection of Turkmenistan and its Service for Forest Seeding and the Protection of Natural Parks
Agency responsible for managing state forest fund	Department of Forestry, Service for forestry and natural park protection
Total employees of state forest fund	1500
Of which central/ local?	80-100/1,400
Sources of income of SFF: central budget, commercial, other	Central budget, as well as enterprise related income
Local agencies/forest management units/*leskhoz*:	
Autonomous or centrally managed?	Activities on the ground are implemented under the Department of Forestry's supervision
How many units?	7 forest enterprises (*leskhoz*)
How many staff?	500
Sources of finance for local units: budget or commercial enterprise?	Budget financing and enterprise activities
Other agencies who manage publicly owned forests	Many ministries and departments are involved in the implementation of the National Forest Programme, some of them have set up forest enterprises for the creation of forest plantations. However, they are not involved in forest management.
Any discussion of other tenure forms (leasing, community forestry, privatisation etc)?	The Society for the Protection of Nature of Turkmenistan and a number of other public organizations participate in charity campaigns on afforestation.

Source: National experts. For more information about sources of data and methods of estimation visit the publication's website.

As regards financing:

In addition to budget allocations, funds are received from the enterprise activities of the *leskhozes*. Funds from the sale of fuel wood are available to the *leskhozes*. Another source is the secondary use of the forest.

The service of forest growing, and protection of natural parks is a structural unit of Ministry of Agriculture and Environment Protection of Turkmenistan is fully financed from the state budget, it carries out the state forest control service.

ANNEX 3.8 FORESTS AND FOREST SECTOR OVERVIEW: UZBEKISTAN

By Kit Prins and Abduvokhid Zakhadullaev

CONTEXT

Uzbekistan is a dry, double-landlocked15 country in Central Asia, with a total area of nearly 45 million ha, consisting mainly of mountains (20%) and arid / semi-arid areas (70%). The rest of the country consists of intensively irrigated valleys located along 2 major rivers of the country (Syr Darya and Amur Darya). The largest desert of Central Asia, Kyzyl Kum, covers most of the lowlands and plains in the west and south of the country. Information on national laws, decrees and statistics supplied by the national expert, Mr. Zakhadullaev.

ANNEX FIGURE 16:

Map of Uzbekistan.

Source: United Nations Geospatial Information Section, 2004.

15 I.e. completely surrounded by countries which are themselves landlocked. The only other double landlocked country in the world is Liechtenstein.

ANNEX TABLE 38:

Uzbekistan in context, around 2015.

Total area (incl. water)	Million ha	44.7
Population	Million	32.9
Share of rural residents	%	49.3
GDP/person	$	1,534
Share of population living below the national poverty line	%	12.3
Forest cover	%	7.2
Forest per inhabitant	ha	0.10

Source: FAO 2015, 2010, World Bank 2017, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

A large part of the territory of Uzbekistan is highly susceptible to land degradation and desertification. Foothills and mountains, although less drought prone, are more prone to erosion and natural disasters, including landslides and mudflows. According to preliminary forecasts, this trend will increase in the future due to the predicted climate. The desiccation of the Aral Sea and the delta of the Amu Darya River has led to a significant disruption of the ecosystem, and this problem is considered to be the most serious man-made disaster on the territory of Uzbekistan, which is also of global significance.

The most serious environmental problems threatening the country's natural resources include increasing soil salinization and water pollution, wind and water erosion, overgrazing, deforestation and reduction of biodiversity, as well as reduced arable land productivity. Over the past 15–20 years, extensive pasture degradation has also been observed due to overgrazing, lack of proper pasture maintenance and other anthropogenic factors. Land productivity is falling, and the scale of wind and water erosion is growing.

Uzbekistan has a population of over 30 million, of which 2.3 million live in the capital Tashkent. Half of the inhabitants live in rural areas. The life and well-being of the rural population is directly related to forests and other categories of land of the State Forest Fund. Due to insufficient institutional capacity and management system, there are cases of cutting down trees for fuel and uncontrolled grazing, which is the cause of forest degradation.

The country produces cotton, gold, copper, uranium and natural gas. It is classified as "middle income" by the World Bank, with GDP per person of nearly $1534. There are no recent data on extreme poverty in Uzbekistan[16], but according to the Asian Development Bank, in 2016, 12.3% of the population lived below the national poverty line. Population density in rural areas is low, except for the fertile and irrigated Fergana Valley.

Forest cover is rather low: 7.2%, partly due to the difficult climatic and physical conditions, and partly due to the pressures on the forest which will be presented below. There is on average 0.1 ha of forest for each resident, which is significantly less than the European average (1.2 ha/person), but in the same range as central-West Europe, and other Central Asian countries.

ANNEX FIGURE 17:

Mountains in Charvak, Uzbekistan.

Source: iStock.

TRENDS FOR THE FOREST RESOURCE

In Uzbekistan, as in other countries of Central Asia, forests' main function is protection: they play a crucial role in combating desertification, preventing erosion and other natural disasters, as well as protecting irrigated agricultural land and pastures from degradation. Thus, they have a significant positive impact on other sectors of the national economy, such as agriculture, livestock and water conservation. 93% of forests perform functions of soil and water protection, 6% carry out biodiversity conservation functions and only 1% perform other functions.

There are three main forest types in Uzbekistan:

- drought and salt resistant forests, notably of Saxaul in the desert regions, with very sparse tree cover.
- mountain forests, including of juniper, in the south and east of the country, under pressure from grazing and fuelwood demand, and often situated in vulnerable ecosystems.
- Tugai or riverine forests, which have been badly damaged by irrigation projects for cotton and resulting salinity.

The total area of the State Forest Fund is 12.21 million ha, including an area of forest (according to the international

[16] According to the World Bank, in 2003, two thirds of the population lived in extreme poverty (defined as less than $1.90/day), although this share has certainly fallen over the intervening 15 years.

FAO definition) of 3254 thousand ha, 10% more than in 2015, perhaps because of a transfer of forests to the State Forest Fund. There has been an annual increase in forest area, especially in the desert zone of the Aral Sea and efforts are in hand to protect existing forests from degradation, effects of grazing and excessive harvesting of firewood.

The total growing stock is 26 million cubic meters, including coniferous - 7 million cubic meters and deciduous - 19 million cubic meters. There has been a programme to plant poplar and other fast-growing species, mostly in river valleys, but success rates have been low, partly due to salinity (Vildanova, UNECE/FAO, 2006). Nevertheless, according to FRA 2015, a quarter of Uzbekistan's forests, 0.8 million ha, are considered "planted forest". Just over two percent of forests are considered "primary forest".

All forests are state-owned and come under the responsibility of the State Committee on Forestry (Goskomles), which has a number of local branches which carry out forest operations. To the author's knowledge, there are no arrangements in place for leasing or for community/participatory forest management. As they are publicly owned, and managed by an official body, the forests are considered to have a long-term forest management plan, although it is not clear how detailed these plans are and to what extent they are implemented.

There is no agreed certification standard for Uzbekistan, and no forest management unit has been certified by FSC or PEFC.

Disturbance (fire, insects, disease) is reported on 0.8% of the forest area.

In recent years, degradation and anthropogenic impact on forests in Uzbekistan due to the expansion of agricultural land, increase in livestock numbers, uncontrolled harvesting of non-forest forest resources, increasing demand for industrial and fuel wood, large-scale industrial development, water withdrawal for agricultural irrigation, etc. have been intensified.

ANNEX TABLE 39:

Forest resources of Uzbekistan, 1988 and most recent.

		1988	Most recent
Area of forest	1,000 ha	1,908.9	3,254
Area of other wooded land	1,000 ha	1,869.5	115.4
Forest and other wooded land	1,000 ha	3,778.4	3,369.4
Average annual % change in forest area	%	-	2.54
Growing stock	Million m^3	11.03	55.1
Share of primary forest	%	-	2.3
Share of plantations for wood production	%	-	24.9
Share of publicly owned forest	%	100	100
Share of public forest managed by state forest agency/enterprise	%	93.8	100
Proportion of forest area under a long-term forest management plan	%	100	100
Area of certified forest	Ha	0	0
Area of disturbed forest (all causes, including fire, insects, disease) as percent of total forest	%	-	0.8

Source: FRA 2010, 2015; State Committee of USSR on Forestry, 1990; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Major gaps in information on the forest resource: No modern forest inventory has been carried out for over 20 years, so none of the information presented in this section may be considered reliable, especially with regard to trends over time. The first priority with regard to forest resource information must be to carry out a scientific inventory of Uzbekistan's forest resources, following agreed best practice, and designed to provide evidence-based responses to future FRA, as well as to enquiries on achievement of SDG goals, and reporting on commitments made in the context of UNFF.

GOODS AND SERVICES PROVIDED BY THE FOREST RESOURCE

ANNEX TABLE 40:

Goods and services provided by the forests of Uzbekistan, most recent period.

Recorded total harvest	1,000 m^3	36
Estimated total harvest, including non-recorded	1,000 m^3	-
Wood fuel production	1,000 m^3	26
Share of wood fuel in wood production	%	72.2
Share of forest area with a designated management objective to maintain and enhance its protective functions	%	83.4

Share of forest strictly conserved for protection of biodiversity	%	12
Main non-wood forest products and services	-	Honey, nuts (pistachio, walnut), medicinal and aromatic plants, fruit, handicrafts[17]
Employment in forestry, staff per hectare	FTE/1,000 ha	3.1
Net GHG emissions (source)/ removals (sink) of forests per thousand hectares of forest	tCO_2e/ha	-0.2

Source: FAO 2015, 2010, national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

From the 1960s, only sanitation fellings have been allowed in Uzbekistan, because of the priority given to the forests' protective function. Wood removals were reported to FAO as less than 40,000 m^3, of which over 70% was fuelwood. However, this figure does not appear to include an estimation of unrecorded or illegal fellings, even though these are believed to be significant.

83% of forests are designated for protection roles, in mountainous and desert regions, reflecting the priority given to this function. Almost all of this area is linked to desertification control, according to FRA 2015. 12% of forests are conserved for the protection of biodiversity.

Ten thousand people are estimated[18] by a national experts to be employed in the forest sector, which gives an average of 3.1 staff (FTE – full time equivalent) per thousand hectares. This average appears rather low, even though it is clear that the forest agency does not have sufficient staff for its responsibilities. It may be that much informal employment has not been included.

It is estimated that the forests of Uzbekistan remove 560 $ktCO_2e$ a year from the atmosphere, or 0.2 tons CO_2 equivalent per hectare. The carbon sequestration capacity of Uzbekistan forests is limited by the difficult growth conditions they must contend with, and the low growing stock and increment per hectare, notably in the desert areas.

Major gaps in information on goods and services provided by the forest: After a recent forest inventory, as mentioned above, it is desirable to construct a realistic estimate of unrecorded fellings to quantify the stress put on forests. The number of forest dependent people should also be estimated, and some enquiry be carried out into their livelihoods (Commitment under United Nations Strategic Plan on Forests 2017-2030).

[17] In descending order of value, as reported to FRA 2015.

[18] The FAO study of employment in forestry reports 7.1 thousand FTE, (2.2 FTE/000 ha) and other estimates are of 1.3 FTE/000 Clearly, there is a need for improved information on employment in forestry.

FOREST PRODUCTS MARKETS AND TRADE

ANNEX TABLE 41:

Production, trade and consumption of forest products in Uzbekistan, most recent period.

Production of sawnwood	1,000 m^3	25
Self-sufficiency in forest products	%	2.6
Consumption per head of forest products	m^3 RE/cap	0.2
Share of forest products imports from the Russian Federation	%	75.2

Source: FAO, 2016; national experts and author's estimations. For more information about sources of data and methods of estimation visit the publication's website.

Consumption of forest products is at low levels in Uzbekistan (0.2 m^3 roundwood equivalent per head, as compared to 0.86 in Europe, according to SoEF 2015), and nearly 98% of this is imported. More than three quarters of imports originate in the Russian Federation.

Major gaps in information on forest products markets and trade: in view of the small size of the markets, data quality seems satisfactory.

POLICIES AND INSTITUTIONS

In Uzbekistan, forest policy and production activities related to forests are under the jurisdiction of the State Committee of the Republic of Uzbekistan on Forestry (Goskomles), which replaced the Main Forestry Directorate under the Ministry of Agriculture and Water Management (Decree of the President of the Republic of Uzbekistan dated May 11, 2017 No. UP-5041). The forest fund area increased by 2.575 million ha as certain areas were transferred from other administrations to Goskomles.

The main responsibilities of Goskomles are as follows:

- The program of measures for the effective organization of forestry activities, the introduction of advanced scientific and technical achievements in the industry, the renewal of the material and technical base, and the attraction of international grants to the industry for 2017–2021.
- Activities to expand the area (reconstruction) of forests, the production of seedlings, the collection of medicinal herbs, the provision of areas for grazing and agricultural production in 2017 – 2019.
- Forecast parameters of agricultural production, beekeeping, fish farming, animal husbandry and industry, as well as the provision of paid services to the population in 2017 - 2019 in the context of state forestry.

In addition, Goskomles is responsible for the conservation and improvement of existing forests, as well as for increasing forest land through forest restoration, afforestation, creation of forest and pasture protective belts and forest cultures.

In 2018, the Law of the Republic of Uzbekistan "on forest" was revised and approved. The law regulates relations in the field of protection, protection, breeding, reproduction, and restoration, increase of productivity and use of forests. Forest policy is carried out on the basis of the Constitution of the Republic of Uzbekistan, Laws of the Republic of Uzbekistan "on nature protection", "on plant protection", "on protected natural territories" and others.

Finally, a long-term strategy on structural reform of the national economy by 2021 was announced by the newly elected president in 2016. The strategy focuses on ensuring energy and environment sustainability but makes no mention of forest issues.

Leskhoz (forestry enterprises) should look for new approaches and mechanisms to achieve their goals, and this includes finding opportunities for collaboration with other stakeholders, such as co-management of forests with local households, and the benefits will be mutual for both leshoz and for the local population. Development of mechanisms for broad involvement of local people in sustainable forest management and improvement of living conditions and incomes of forest dependent people.

MAJOR CHALLENGES FOR THE FOREST SECTOR

On the basis of the information presented above, as well as other sources, the following major challenges have been identified:

- Increasing the forests' contribution to protection of fragile ecosystems, notably around the Aral Sea.
- Protecting existing forests from degradation and pressures from grazing and excessive fuelwood harvesting.
- Increasing forest area, for protection and wood production.
- Improving livelihoods of forest dependent people.
- Improving effectiveness of forest sector institutions, notably by ensuring regional forest administrations and managers have adequate equipment.
- Developing a national consensus on the role of forests, policy goals and availability of resources necessary to achieve them, flowing from high level political will to achieve sustainable forest management.

DIRECTION OF FOREST SECTOR POLICY

"A National Action Plan on combating desertification, degradation and droughts" is under development within the context of the national development strategy, and a Concept for forestry development up to 2030 has been drafted.

The main goal of the Concept is determination of the key development priorities for forestry sector. The priorities are focused on implementation of more efficient and effective measures aimed at conservation and accelerated reproduction of forest resources; strengthening environmental and protective functions of forests; resource-saving utilization of the state forest stock lands and forests; development of the corresponding social aspects of forestry with consideration of best practices, gained experience; and changing regional and world development environments. Development and implementation of the Concept would envisage revision of the structure of the main forest department (MFD), development and adoption of the *Forestry Code* and key principles of forestry development along with the long-term forestry development scheme for next 50 years. This will also require introduction of changes and amendments into the relevant existing national legislation." (APFnet, 2017 B).

However, as of August 2018, to the knowledge of the author, this ambitious and comprehensive Concept has not been finalised and resources have not been made available for its implementation.

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ANNEX TABLE 42:

State forest related institutions in Uzbekistan.

Responsibility for policy formulation	State Committee of the Republic of Uzbekistan on Forestry (Goskomles)
Enforcement of policy, monitoring	State Committee of the Republic of Uzbekistan on Forestry (Goskomles)
Agency responsible for managing state forest fund	State Committee of the Republic of Uzbekistan on Forestry (Goskomles)
Total employees of state forest fund main forest department	8,482
Of which central/ local?	
Sources of income of SFF: central budget, commercial, other	The financial support of forestry activity is realized from the budget of Republic of Uzbekistan as well as from other sources provided for in the legislation and from the Forestry Development Fund. According to the Regulations part of the income from supply of non-wood products, for instance livestock, horticultural products, beekeeping, agricultural products and services will be transferred to the Forestry Development Fund
Local agencies/forest management units/*leskhoz*:	
Autonomous or centrally managed?	Not known
How many units?	67 forestry offices plus various technical branches
How many staff?	
Sources of finance for local units: budget or commercial enterprise?	
Other agencies who manage publicly owned forests	State Committee for Nature Protection (SCNP) (90,000 ha) and Tashkent Province Khokimiyat (Mayor) (600,000 ha)
Any discussion of other tenure forms (leasing, community forestry, privatisation etc)?	Lands of the State Forest Fund can be given for use (permanent or temporary) to legal and private entities. Permanent forest users are forestry enterprises, establishments and organizations, which are provided with lands of the State Forest Fund under a permanent tenure agreement. Temporary forest use can be short-term (i.e. up to 3 years), or long-term (i.e. up to 10 years (Botman, 2009)

Source: National experts. For more information about sources of data and methods of estimation visit the publication's website.

SOME FACTS ABOUT THE EUROPEAN FORESTRY COMMISSION

The European Forestry Commission (EFC) was created in 1947 and it is one of six Regional Forestry Commissions established by FAO to provide a policy and technical forum for countries to discuss and address forest issues on a regional basis.

The purpose of EFC is to advise on the formulation of forest policy and to review and coordinate its implementation at the regional level; to exchange information and, generally through special Subsidiary Bodies, to advise on suitable practices and action with regard to technical and economic problems, and to make appropriate recommendations in relation to the foregoing. It meets every two years and English, French are Spanish are the official languages of the Commission.

The EFC has a number of associated subsidiary bodies, including the Working Party on the Management of Mountain Watersheds, the Working Party on Mediterranean forestry issues (Silva Mediterranea) and shares with ECE the ECE/FAO Working Party on Forest Statistics, Economics and Management.

FAO encourages wide participation of government officials from forestry and other sectors as well as representatives of international, regional and subregional organizations that deal with forest-related issues in the region, including NGOs, and the private sector. Accordingly, EFC is open to all Members and Associate Members whose territories are situated wholly or in part in the European Region or who are responsible for the international relations of any non-self-governing territory in that Region. Membership comprises such eligible Member Nations as have notified the Director-General of their desire to be considered as Members.

EFC is one of the technical commissions serving to the FAO Regional Office for Europe and Central Asia (REU) and the EFC Secretary is based in Geneva. EFC work is regulated by Rules of Procedures, which were adopted by the FAO Conference in 1961 and amended at the Eighteenth Session of the Commission in 1977.

More information about the Commission's work may be obtained by contacting:

ECE/FAO Forestry and Timber Section

Forests, Land and Housing Division

United Nations Economic Commission for Europe/

Food and Agriculture Organization of the United Nations

Palais des Nations

CH-1211 Geneva 10, Switzerland

info.ECE-FAOforests@unece.org

www.unece.org/forests

SOME FACTS ABOUT THE COMMITTEE ON FORESTS AND THE FOREST INDUSTRY

The UNECE Committee on Forests and the Forest Industry is a principal subsidiary body of the United Nations Economic Commission for Europe (UNECE) based in Geneva. It constitutes a forum for cooperation and consultation between member countries on forestry, the forest industry and forest product matters. All countries of Europe, the Commonwealth of Independent States, the United States of America, Canada and Israel are members of the UNECE and participate in its work.

The UNECE Committee on Forests and the Forest Industry shall, within the context of sustainable development, provide member countries with the information and services needed for policymaking and decision-making with regard to their forest and forest industry sectors, including the trade and use of forest products and, where appropriate, will formulate recommendations addressed to member governments and interested organizations. To this end, it shall:

1. With the active participation of member countries, undertake short-, medium- and long-term analyses of developments in, and having an impact on, the sector, including those developments offering possibilities for the facilitation of international trade and for enhancing the protection of the environment.

2. In support of these analyses, collect, store and disseminate statistics relating to the sector, and carry out activities to improve their quality and comparability.

3. Provide the framework for cooperation e.g. by organising seminars, workshops and ad hoc meetings and setting up time-limited ad hoc groups, for the exchange of economic, environmental and technical information between governments and other institutions of member countries required for the development and implementation of policies leading to the sustainable development of the sector and to the protection of the environment in their respective countries.

4. Carry out tasks identified by the UNECE or the Committee on Forests and the Forest Industry as being of priority, including the facilitation of subregional cooperation and activities in support of the economies in transition of central and eastern Europe and of the countries of the region that are developing from an economic perspective.

5. It should also keep under review its structure and priorities and cooperate with other international and intergovernmental organizations active in the sector, and in particular with the FAO (the Food and Agriculture Organization of the United Nations) and its European Forestry Commission, and with the ILO (the International Labour Organisation), in order to ensure complementarity and to avoid duplication, thereby optimizing the use of resources.

More information about the Committee's work may be obtained by contacting:

UNECE/FAO Forestry and Timber Section

Forests, Land and Housing Division

United Nations Economic Commission for Europe/

Food and Agriculture Organization of the United Nations

Palais des Nations

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Forests and Economic Development: A Driver for the Green Economy in the ECE Region	ECE/TIM/SP/31
Forest Products Annual Market Review 2011-2012	ECE/TIM/SP/30
The North American Forest Sector Outlook Study 2006-2030	ECE/TIM/SP/29
European Forest Sector Outlook Study 2010-2030	ECE/TIM/SP/28
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Private Forest Ownership in Europe	ECE/TIM/SP/26
Forest Products Annual Market Review 2009-2010	ECE/TIM/SP/25
Forest Products Annual Market Review 2008-2009	ECE/TIM/SP/24
Forest Products Annual Market Review 2007-2008	ECE/TIM/SP/23
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