Working Draft 2022

REPUBLIC OF KAZAKHSTAN

Country Profile and Context

AFoCO
Asian Forest Cooperation Organization

Contents

Abbreviations and Acronyms

AFoCO	Asian Forest Cooperation Organization
BMZ	German Ministry for Economic Cooperation and Development
BoP	Balance of Payments
BSc	Bachelor of Science
CACILM	Central Asian Countries Initiative on Land Management
CDB	Convention on Biological Diversity
CFW	Committee of forestry and wildlife
CIF	Cost, Insurance and freight
CIS	Commonwealth of Independent States
CIT	Corporate Income Tax
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CMS	Conservation of Migratory Species of Wild Animals
DFED	Department for Forest Ecosystems Development
EAEU	Eurasian Economic Union
ELSAs	Essential Life Support Areas
EU	European Union
FAO	Food and Agriculture Organization
FDA	Forest Development Authority
FOB	Free On Board
FRA	Forest Resources Assessment
FTE	Full-Time Equivalents
GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	German Society for International Cooperation (Deutsche Gesellschaft für Internationale Zusammmenarbeit)
GmbH	Company with Limited Liability (Gesellschaft mit beschrankter Haftung)
HS	Harmonized System
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature
KazNIIEK	Kazakh State Climate and Ecology Research Institute
LDN	Land Degradation Neutrality
MEP	Ministry of Environmental Protection
MoU	Memorandum of Understanding
MSc	Master of Science

NEAP	National Environment Action Plan
NGO	Non-Governmental Organization
NIFoS	National Institute of Forest Science (in Republic of Korea)
OECD	Organisation for Economic Co-operation and Development
OIC	Organisation of Islamic Cooperation
Ph.D.	Doctor of Philosophy
PIT	Personal Income Tax
PPP	Purchasing power parity
SDG	Sustainable Development Goals
SEZ	Special Economic Zone
SNC	Second National Communication
SNC	Second National Communication
SNNP	State National Natural Park
SNR	State Nature Reserve
SRE	State Republican Enterprise
SSCs	Social Security Contributions
TACIS	Technical Assistance for the Commonwealth of Independent States
UN	United Nations
UNCCD	United Nation Convention to Combat Desertification
UNDP	United Nations Development Programme
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
UNFF	United Nations Forum on Forests
VAT	Value-Added Tax

1. Introduction

Today, the Republic of Kazakhstan (hereinafter referred to as Kazakhstan) focuses all efforts on joining the world's ~~50~~ 30 most competitive countries. In this regard, Kazakhstan works strenuously at enhancing the potential of local industry and exceeding opportunities for small business, improving living conditions of vulnerable groups of society, developing health service and educational system, and providing opportunities for realization for all people, despite gender, race, and religion accessories. At the same time the state concerns about the ecology and conditionals of the environment. That's why another challenge Kazakhstan has faced lately is the issue of the transition to a "green economy" and the conservation of natural resources and biodiversity. Kazakhstan's biodiversity and ecosystems create high economic values for many sectors of the country's economy and stakeholder groups.[1] Kazakhstan focused on developing "green" economy-related knowledge and skills, small- and medium-sized enterprise development, and strengthened capacities for local administrators. Additional focus was given to introducing new opportunities such as ecological tourism, specially protected areas, "green" procurement, and sustainable urban development and waste management. Kazakhstan's pledge for carbon neutrality by 2060 was supported by the United Nations through greater integration of climate and green economy policies and a demonstration of best practices.[2]

According to the World Bank, Kazakhstan is now among the world's top twenty nations that are most attractive for foreign investments, and the presence of global companies such as Chevron, GE, British Gas, Samsung, Chinese National Petroleum Company, and others, is a vivid proof of that. Kazakhstan has stable relationships with all of its neighbors. Kazakhstan is a member of the United Nations, Organization for Security and Cooperation in Europe, Euro-Atlantic Partnership Council, and the Organisation of Islamic Cooperation (OIC). And, it is an active participant in the North Atlantic Treaty Organisation Partnership for Peace program.[3]

This document aims to provide a general overview of Kazakhstan and relevant contexts and baseline information to assist the designing of the cooperation framework under AFoCO. The information contained in this document has been gathered mainly through desk-based research and review of available national statistics, national laws and policies, technical reports, and other secondary data sources, and subsequently validated by the focal agency of the Republic of Kazakhstan. Should there be significant changes in national forest policy or context, they will be reflected accordingly.

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[1] The Clearing-House Mechanism of the Convention on Biological Diversity, *6th National Report for the Convention on Biological Diversity* (n.p.: The Clearing-House Mechanism of the Convention on Biological Diversity, n.d.), 6-7.

[2] United Nations, *United Nations in Kazakhstan ANNUAL REPORT 2020* (n.p.: The UN, 2020), 21.

[3] "About Kazakhstan," *UNDP in Kazakhstan*, last modified n.d., accessed Apr 19, 2021, https://www.kz.undp.org/content/kazakhstan/en/home/countryinfo.html.

2. Country Overview

2.1. Geographic Profile

The Republic of Kazakhstan (hereinafter referred to as Kazakhstan) is a country with a rich historical and cultural past. Situated in the center of Eurasia, Kazakhstan found itself at the crossroad of the earliest civilizations of the world with social and economic, cultural, and ideological connections between East and West, South and North, between Europe and Asia.[4]

Kazakhstan (55° 26'- 40° 56' north latitude and 46° 27' - 87° 18' eastern longitude) lies between the Siberian Taiga and the Central Asian deserts. [5]

Kazakhstan is located in the center of the continent of Asia, with a coastline only on the landlocked Caspian Sea. The size is 2.724 million square kilometers, making Kazakhstan the ninth largest nation in the world. Some 47,500 kilometers of the total area is occupied by bodies of water. Kazakhstan has common borders with China (1,783 kilometers), Kyrgyzstan (1,242 kilometers), Russia (7,591 kilometers), Turkmenistan (426 kilometers), and Uzbekistan (2,351 kilometers). Kazakhstan's topography varies considerably by region. In the east and northeast, about 12 percent of its territory is occupied by parts of the Altay and Tian Shan mountain ranges with elevations of up to 6,995 meters. More than three-quarters of the country is desert or semidesert, with elevations less than 500 meters.[6]

Figure 1: Kazakhstan is highlighted in red[7]

[4] Valeriy Meshkov et al., "Forest Rehabilitation in Kazakhstan," *IUFRO World Series* 20 no.4 (2009): 83-130.

[5] Ministry of Natural Resources and Protection of Environment of the Republic of Kazakhstan, *National Strategy and Action Plan on Conservation and Sustainable Use of Biological Diversity in the Republic of Kazakhstan* (Kokshetau: The Ministry of Natural Resources and Protection of Environment of the Republic of Kazakhstan, 1999), 10.

[6] https://www.akorda.kz/en/republic_of_kazakhstan/kazakhstan.

[7] "Kazakhstan Map and Satellite Image," *Geology.com*, last modified n.d., accessed Apr 19, 2021, https://geology.com/world/kazakhstan-satellite-image.shtml.

2.2. Government and Administration

The president is elected by direct ballot to a five-year term. The President of the Republic of Kazakhstan is the head of state, the highest political official, who determines the main directions of the domestic and foreign policy of the country and represents Kazakhstan on the international arena. The Government implements executive powers, heads the system of executive bodies, and exercises supervision of their activity.

The government is formed by the president in accordance with the Constitution of the Republic of Kazakhstan. The ministries constitute the structure of the Government. The Government includes members of the Government – the prime minister, his deputies, ministers and other officials.

Officially, the prime minister, one deputy, and the 18 ministers (Box 1) that compose the government implement policy; the president determines policy. Only the president can introduce constitutional amendments. He or she has the power to appoint and dismiss the government, dissolve parliament, call for referendums, and appoint administrative heads of regions. Major foreign investment and foreign policy issues are handled by the president's office. The president appoints the members of the Committee for National Security, which plays a major role in law enforcement through its responsibilities for national security, intelligence, and counterintelligence.

Legislative Branch

According to the Constitution of the Republic of Kazakhstan passed on the republican referendum on August 30, 1995. The Parliament of two Houses of the Republic of Kazakhstan is a high representative organ of the Republic, realizing legislative functions. The organization and activity of the Parliament of the Republic of Kazakhstan, and the legal position of its deputies are determined by the Constitution, Constitutional Law "Parliament of the Republic of Kazakhstan and status of its deputies" and other legislative acts. The authorities of the Parliament begin since the moment of the opening of its first session and end with the beginning of the work of the first session of the Parliament of the new convocation. The term of the Parliament authorities is defined by the term of the Mazhilis deputy authorities of the regular convocation. The Prior cessation of the Parliament authorities can be only realized in the case and order provided by the Constitution of the Republic of Kazakhstan.

The Parliament consists of two Chambers: Senate and Mazhilis acting on a constant basis.

The Senate is formed by the deputies elected on two persons from each region, cities of the republican importance, and capitals of the Republic of Kazakhstan, on a joint meeting of the deputies of all representative bodies according to the region, city of the republican importance and capital of the Republic. 15 deputies are designated by the President of the Republic for the term of Senate authorities. The half of the elected Senate deputies are re-elected each three years. The term of authorities of the Senate deputies is six years.

The Chairperson leading the Chamber, elected by the Senate from the number of deputies with a fluent speaking state language, and by the secret voting majority from the total number of deputies

of the Chamber. The candidature on a post of the Chairperson of Senate is nominated by the President of the Republic of Kazakhstan.
Mazhilis consists of 105 deputies. 98 deputies are elected on the basis of party lists on a system of proportional representation and on a territory of united national electoral district. The term of authorities of the Mazhilis deputies is five years.
The Chairperson leading the Chamber, elected by the Mazhilis from the number of deputies with a fluent speaking state language, and by the secret voting majority from the total number of deputies of the Chamber. The candidature on a post of the Chairperson of the Mazhilis is nominated by the President of the Republic of Kazakhstan[8].

Judicial Branch

The highest court in Kazakhstan is the 44-member Supreme Court, whose members are nominated by the president and approved by the Senate. The Supreme Court is the appeals court for decisions taken at lower (district and province) court levels. Although nominally Supreme Court judges are appointed for life, in fact, they retire at the mandatory federal retirement age of 65. Under the 1995 constitution, the Constitutional Court that had been established in 1991 was replaced by the Constitutional Council. The council rules on all constitutional matters, but its decisions are subject to a presidential right of veto. The council is composed of seven members: three appointed by the president and four appointed by the legislature. Citizens have no right to appeal on council decisions.

Administrative Divisions

The system of administrative and territorial structure of the Republic of Kazakhstan comprises the following administrative and territorial units: aul (village), settlement, aul (village) district, district in a town, town, district, province. (Article 1. Law of the Republic of Kazakhstan Concerning the administrative and territorial system of the Republic of Kazakhstan, № 2572-XII of 8 December, 1993)
The country is divided into 14 administrative zones and has 3 cities of national significance [9]. In order to implement public administration on the basis of an optimal combination of republican and local interests, the territory of the Republic of Kazakhstan is divided into two main categories – regions and localities. A region is a part of the territory of the republic, including several settlements, formed and managed in the interests of the republic. The regions are the oblast, the district and the rural district as the main links of the republican administrative-territorial structure.
A locality is a part of the compactly populated territory of the republic, formed as a result of economic and other social activities of citizens, with a population of at least 50 people, registered in accordance with the procedure established by law and managed by local representative and executive bodies.

[8] https://parlam.kz/en .

[9] https://www.akorda.kz/en/republic_of_kazakhstan/kazakhstan

Settlements located on the territory of the Republic of Kazakhstan are divided into urban and rural. According to the land balance as of November 1, 2018, the system of administrative-territorial structure of the republic includes 14 regions, 3 cities of republican significance, 161 administrative districts, 193 cities of regional, district significance and settlements, 6,448 rural settlements and 2,354 aul (rural) districts.

Judicial and Legal System

The Decree of the President "On the State program of legal reform in the Republic of Kazakhstan" dated February 12, 1994, became a historical document that approved the priority directions of the reform of the judicial and legal system. A fair and independent court; a highly qualified, impartial judge appointed on a permanent basis; improving the social and household provision of judges is the basis for objective justice and a decent life for Themis servants, and this is what emphasizes the importance and immeasurable responsibility of judges for the results of their work, social protection of the honor of a man in a mantle. Social and domestic issues were considered as one of the most important problems. This resolution clearly regulated the structure of the judicial bodies of the republic, the powers of judges, and the issues of judicial personnel. The Supreme Court was recognized as the highest instance of judicial power, whose competence included cassation, supervisory, controlling activities over the work of lower courts, and it was also recognized as a body providing explanations on judicial practice and the application of legislative acts. The structure and composition of the judiciary were determined. It was stipulated that in the Supreme Court all internal economic issues, all issues related to the administration of justice, providing judges with everything necessary for this - all these concerns were henceforth assigned to the head of the staff. Currently, the composition of regional and city courts is identical, military courts on the territory of Kazakhstan can become part of the plenum of the Supreme Court of the Republic for all competence and tasks performed. The Institute of People's Assessors was abolished. The next step of the President of the Republic in reforming the judicial system was the Decree of 1995, which has the force of a constitutional law, "On Courts and the status of judges in the Republic of Kazakhstan". The Law approved the defining status of the independent judiciary - one of the equal branches of the unified state power[10].

Box 1: Government Composition (as of 2022)[11]

Prime Minister of the Republic of Kazakhstan
First Deputy Prime Minister
Deputy Prime Minister
Deputy Prime Minister – Minister of Foreign Affairs
Deputy Prime Minister – Minister of Trade and Integration
Head of the Office of the Prime Minister
Minister of Defense
Minister of Internal Affairs

[10] From the History https://sud.gov.kz/eng/content/history-0

Minister of Information and Social Development
Minister of Agriculture
Minister of Justice
Minister of Education and Science
Minister of Healthcare
Minister of Labor and Social Protection of the Population
Minister of Industry and Infrastructure Development
Minister of Finance
Minister of Culture and Sports
Minister of Emergency Situations
Minister of National Economy
Minister of Digital Development, Innovation and Aerospace Industry
Minister of Ecology, Geology and Natural Resources
Minister of Energy

The President

Kassym-Jomart K. Tokayev Born on May 17, 1953, in the city of Alma-Ata (Almaty). Father – Kemel T. Tokayev (1923-1986), a veteran of the Great Patriotic War, a well-known writer, founder of a detective-adventure genre in Kazakh literature. Mother – Turar Shabarbayeva (1931-2000), worked for the Alma-Ata Teacher Training Institute of Foreign Languages.

In 1975, Kassym-Jomart Tokayev graduates from the Moscow State Institute of International Relations (MGIMO). He got his pre-degree internship at the USSR Embassy in the People's Republic of China. In 1983-1984, he interned at the Beijing Linguistic Institute. In 1992, he graduated from the Diplomatic Academy of the Ministry of Foreign Affairs of the Russian Federation. He started his career in 1975, in the Ministry of Foreign Affairs of the USSR and was posted to the Soviet Embassy in the Republic of Singapore. In 1979, he returned to the USSR Ministry of Foreign Affairs. From 1984 to 1985, he worked at the USSR Ministry of Foreign Affairs, and thenwas posted to the Soviet Embassy in China, where he served until 1991 as Second Secretary, First Secretary and Counsellor[11].

In 1992, he was appointed as the Deputy Foreign Minister of the Republic of Kazakhstan. In 1993, he became the First Deputy Foreign Minister. In 1994, he was appointed as the Minister of Foreign Affairs. In March 1999, he became the Deputy Prime Minister. In October 1999, with the consent of the Parliament by the Decree of the President of Kazakhstan, he was appointed as the Prime Minister. In January 2002, he becomes the State Secretary – Minister of Foreign Affairs. From 2003 to 2007, he headed the Ministry of Foreign Affairs. At this post, Kassym-Jomart Tokayev was taking an active part in the global process of non-proliferation of nuclear weapons.

[11] "Government Composition," *Primeminister.kz*, https://www.primeminister.kz/en/government/composition.

In January 2007, he was elected as the Chairman of the Senate of the Parliament. In 2008, as the Speaker of the upper chamber of the Kazakh parliament he was elected as the Vice-President of the OSCE Parliamentary Assembly.
In March 2011, he was appointed as the UN Deputy Secretary-General, Director-General of the UN Office at Geneva, as well as served as the Personal Representative of the UN Secretary-General at the Conference on Disarmament. In addition, he also held the position of the Secretary-General of the Conference on Disarmament. He was also elected as the Chairman of the Council of Ministers of Foreign Affairs of the CIS and the Shanghai Cooperation Organization.
On October 16, 2013, he was re-elected as the Chairman of the Senate of the Parliament.
On March 20, 2019, he takes the oath as the President of the Republic of Kazakhstan.
On June 9, 2019, Kassym-Jomart Tokayev had won the early presidential election with 70.96%, and was elected as the President of the Republic of Kazakhstan. On June 12, 2019, in accordance with the article 42 of the Constitution of the Republic of Kazakhstan, he took the oath of office and officially assumed the post of Head of State.
Since 2007, Kassym-Jomart Tokayev has been a member of Nur Otan Party and the Bureau of the Political Council of Nur Otan Party. Member of the Security Council of Kazakhstan. Extraordinary and Plenipotentiary Ambassador. Doctor of Political Sciences. Full member of the World Academy of Humanities and Natural Sciences. Member of the Council of the Wise Men of the Munich Security Conference. Honorary Professor of the Shenzhen University (China) and the Diplomatic Academy of the Ministry of Foreign Affairs of the Russian Federation. Honorary President of Kazakhstan's Council on Foreign Relations. Honorary Dean of the Geneva School of Diplomacy and International Relations. According to the Russian Biographical Society, he enters the list of winners of the "Man of the Year – 2018". Over 13 years he headed Kazakhstan's Table Tennis Federation. He is the author of 10 books on international relations. He has been awarded with numerous state awards of Kazakhstan and foreign countries, as well as with commemorative medals. Kassym-Jomart Tokayev supports a healthy lifestyle. He is fond of reading fiction, political and memoir literature [12.]

Provincial and Local Government

Kazakhstan consists of 14 provinces with Astana (Nur-Sultan[13]), established as the capital city of the Republic. The largest province is Karaganda Province occupying an area of 428,000 km^2 with a population of 1.3 million or 3.1 people per km^2. The provinces in the south of Kazakhstan are the most populated areas with 2.3 million people and a density of 19.8 people per km^2.

The governors of the provinces and districts, called "akims", are appointed by the president. In 2006 a reform measure established direct elections for local governors, who previously were appointed by the akims. At the city, district, and province level, the legislative body is the council

[12] The President of the Republic of Kazakhstan https://www.akorda.kz/en/president/president

("maslikhat"), which is directly elected but has only budgetary and tax-raising power. The province maslikhats also elect the members of the national Senate from their provinces.[14]

2.3. People and Population

In 2019 Kazakhstan's population was estimated at 18,513,930, of which about 51.5 percent was female.[15] The population density was 6.8 persons per km^2.[16] In 2018, 57.4 percent of the population lives in urban areas, and the population is heavily concentrated in the northeast and southeast.[17] According to Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics Kazakhstan's population was estimated at 19 102 465 persons (1 December 2021)

Table 1. Summary of the country profile

Official name (ISO 3166 code)	Republic of Kazakhstan (KZ)
Capital	Nur-Sultan (Former name: Astana)
Population	19 102 465 persons (1 December 2021)Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics[18]
Language	Kazakh, Russian
Currency (ISO 4217 code)	Tenge (₸) (KZT)
Land Area	2,699,700.0 km^2(World Bank, 2018)
Forest Area	30047,7 thousand hectares (Accounting of the forest fund)
GDP per capita (PPP)	27,517.6 thousand current international $ (World Bank, 2019)
HDI	0.825, 51st rank (UNDP,2020)[19]
DAC-ODA Recipients	Upper Middle Income Countries and Territories which are not LDCs
Time zone	UTC +5 (AQTT, ORAT) **UTC +6 (Standard)** (ALMT)
Calling code	+7

[14] UNHCR, *COUNTRY PROFILE: KAZAKHSTAN* (n.p.: The UNHCR, 2006), 13-16.

[15] "Population, female (% of total population) - Kazakhstan | Data," *Data.worldbank.org*, last modified n.d., accessed Apr 19, 2021, https://data.worldbank.org/indicator/SP.POP.TOTL.FE.ZS?locations=KZ.

[16] "Population living in areas where elevation is below 5 meters (% of total population) - Kazakhstan | Data," Data.worldbank.org, last modified n.d., accessed Apr 19, 2021, https://data.worldbank.org/indicator/EN.POP.EL5M.ZS?locations=KZ.

17 UNHCR, COUNTRY PROFILE: KAZAKHSTAN (n.p.: The UNHCR, 2006), 4.

18 Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics, Socio-economic development of the Republic of Kazakhstan (Nur-Sultan: The Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics, 2021), 4.

19 "Human Development Reports," Hdr.undp.org, last modified n.d., accessed Apr 19, 2021, http://hdr.undp.org/en/countries/profiles/KAZ. Source: https://primeminister.kz/en/government/about https://www.akorda.kz/en/republic_of_kazakhstan/kazakhstan

2.4. Sociocultural context

Religions

In 2009 (the first time since the 1937 census) a census was conducted in which respondents were asked about attitudes towards religion. The results of the census showed that the overwhelming majority of the inhabitants of Kazakhstan identified themselves with one religion or another (about 97% of the population), and only 3% of the respondents declared that they were non-believers or refused to answer the question asked.

Table 2. Religious affiliation of the population of Kazakhstan

Respondents' answers about their attitude to religion	Absolute number (Thousand people)	Share in population (%)
Muslims	11,237.9	70.19
Christians	4,190.1	26.17
Atheists	450.5	2.81
Buddhists	14.6	0.09
Jews	5.3	0.03
Did not answer	81.0	0.51
Other religions	30.1	0.19
Total	16,009.6	100.00

About religious associations in Kazakhstan

3834 religious entities representing **18** faiths are registered in the country: **2695** – Islamic, **345** – Orthodox, **88** – Catholic, **592** – Protestant, **60** - Jehovah's Witnesses, **24** - New Apostolic Church, **12** - Krishna Consciousness Society, **7** - Jewish, **6** - Bahai, **2** - Buddhism, **2** - Church of Jesus Christ of Latter-day Saints last days (Mormons), **1** – Unification Movement. There are **3603** religious buildings in the country: **2693** - mosques, **303** - Orthodox churches and **108** - Catholic churches, **407** - Protestant prayer houses, **57** - prayer houses of Jehovah's Witnesses, **24** - prayer houses of the New Apostolic Church, **6** - synagogues, **2** - prayer houses of Bahai, **2** - prayer houses of Krishna Consciousness Society, **1** - Buddhist temple.
(https://www.gov.kz/memleket/entities/qogam/activities/141?lang=en)

2.5. Economic situation

Economy Overview (GDP– growth, contributions by sector)

In 2019, the economy of Kazakhstan grew at a modest rate of 4 percent real GDP. Greater social spending to 5 percent of GDP in 2019 (as compared to 4.4 percent in 2018) boosted household incomes and, with government support to relieve the debt burden of low-income households, sustained real consumption growth. Nevertheless, growth in the real economy is largely limited to non-tradeable services including construction, trade, and transport services, while lower prices and

output weakened the performance of the oil sector. According to the World Bank economic forecast, growth is likely to remain within 4 percent in 2020-2022.[20]

In 2020, the GDP of Agriculture, forestry, and fishery is 3,732,753.2 million tenge (5.3%).[21] In GDP by industry, mining accounts for more than 50 percent of the total in 2019 (Table 2).[22]

Table 3. GDP production in Kazakhstan (2019)

	GDP production (In million tenge)	Industrial production index (%)	Share of economic activity in total volume of industrial production (%)
	2019	2019 to 2018	2019
Total industry	12,937,664.4	103.8	100
The mining industry and working out of open-cast mines	6,944,960.4	103.7	55.4
Manufacturing industry	5,164,537.7	104.4	38.4
Electrical supply, giving of gas, steam, and air-conditioning	708,187.0	101.3	5.3
Water supply; sewer system, the control over gathering and distribution of waste	119,979.3	103.2	0.9

Trade

Since 1999 oil exports have provided Kazakhstan a substantial trade surplus. In 2005, commercial relations with China expanded significantly with the completion of the Atasu–Alashankou oil pipeline into Xinjiang Province and an agreement to export US$10 billion worth of electric power

[20] United Nations Country Team in Kazakhstan, *UN Sustainable Development Cooperation Framework Country Kazakhstan Year 2021-2025* (n.p.: The United Nations Country Team in Kazakhstan, 2020), 5.
[21] Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics, *Socio-economic development of the Republic of Kazakhstan January 2021* (Nur-Sultan: The Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics, 2021), 4.
[22] Ministry of National economy of the Republic Kazakhstan Committee on Statistics, *Socio-economic development of the Republic of Kazakhstan January-December 2019* (Nur-Sultan: The Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics, 2020), 8.

to China. China also bought one of Kazakhstan's largest oil companies, Petro Kazakhstan, and a major natural gas pipeline into Xinjiang was in the planning stage. [23]

Kazakhstan is landlocked and depends on Russia to export its oil to Europe. It also exports oil directly to China. In 2010, Kazakhstan joined Russia and Belarus to establish a Customs Union to boost foreign investment and improve trade. The Customs Union evolved into a Single Economic Space in 2012 and the Eurasian Economic Union (EAEU) in January 2015. Supported by rising commodity prices, Kazakhstan's exports to EAEU countries increased 30.2% in 2017. Imports from EAEU countries grew by 24.1%.[24]

The total value of exports (FOB) is US$ 61,109 million. The total value of imports (CIF) is US$ 33,658 million. At the HS 6-digit level, 3,096 products are exported to 120 countries, and 4,277 products are imported from 177 countries.

The top five exported HS 6-digit level products to the world by Kazakhstan along with trade value are:

1. Kazakhstan exported Petroleum oils and oils obtained from bituminou, worth USD 37,802,957.34 million.
2. Kazakhstan exported Copper cathodes and sections of cathodes unwrou, worth USD 2,248,671.64 million.
3. Kazakhstan exported Natural gas in the gaseous state, worth US$ 2,170,951.54 million.
4. Kazakhstan exported Ferro-chromium containing by weight more than 4, worth USD 1,766,685.23 million.
5. Kazakhstan exported Natural uranium and its compounds, etc., worth USD 1,290,338.25 million.

The top five imported HS 6-digit level products from the world by Kazakhstan along with trade value are:

1. Kazakhstan imported Natural gas in the gaseous state, worth USD 1,034,499.36 million.
2. Kazakhstan imported Petroleum oils, etc., (excl. crude); preparation, worth USD 1,024,269.60 million.
3. Kazakhstan imported Transmission apparatus, for radio, TV, etc., worth USD 869,907.37 million.
4. Kazakhstan imported other medicaments of mixed or unmixed products, worth USD 625,111.17 million.

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[23] UNHCR, *COUNTRY PROFILE: KAZAKHSTAN* (n.p.: The UNHCR, 2006), 10.

[24] "THE WORLD FACTBOOK," *Cia.gov*, last modified Apr 14, 2021, accessed Apr 19, 2021, https://www.cia.gov/the-world-factbook/countries/kazakhstan.

5. Kazakhstan imported Taps, cocks, valves and similar appliances, nes, worth USD 489,451.72 million.

The top five countries to which Kazakhstan exported 2018 along with the partner share in percentage are (Table 3):

1. Kazakhstan exports to Italy worth USD 11,734 million, with a partner share of 19.20 percent.
2. Kazakhstan exports to China worth USD 6,307 million, with a partner share of 10.32 percent.
3. Kazakhstan exports to the Netherlands worth USD 6,186 million, with a partner share of 10.12 percent.
4. Kazakhstan exports to the Russian Federation worth USD 5,280 million, with a partner share of 8.64 percent.
5. Kazakhstan exports to France worth USD 3,839 million, with a partner share of 6.28 percent.

The top five countries to which Kazakhstan imported goods 2018 along with the percentage share are (Table 3):

1. Kazakhstan imports from the Russian Federation worth USD 13,237 million, with a partner share of 39.33 percent.
2. Kazakhstan imports from China worth USD 5,384 million, with a partner share of 16.00 percent.
3. Kazakhstan imports from Germany worth USD 1,640 million, with a partner share of 4.87 percent.
4. Kazakhstan imports from Italy worth USD 1,486 million, with a partner share of 4.41 percent.
5. Kazakhstan imports from the United States worth USD 1,278 million, with a partner share of 3.80 percent.

Table 4. Kazakhstan Top 5 Export and Import partners[25]

Importer (Market)				Exporter			
Rank	Country	Trade (in million USD)	Partner share(%)	Rank	Country	Trade (in million USD)	Partner share(%)

[25] "Kazakhstan Trade | WITS Data," *Wits.worldbank.org*, last modified n.d., accessed Apr 19, 2021, https://wits.worldbank.org/countrysnapshot/en/KAZ.

1st	Italy	11,734	19.20	1st	Russian Federation	13,237	39.33
2nd	China	6,307	10.32	2nd	China	5,384	16.00
3rd	Netherlands	6,186	10.12	3rd	Germany	1,4640	4.87
4th	Russian Federation	5,280	8.64	4th	Italy	1,486	4.41
5th	France	3,839	6.28	5th	United States	1,278	3.80

Foreign Investment

In the post-Soviet era, Kazakhstan has received about 80 percent of the total foreign investment going to Central Asia. Led by the international oil industry, foreign investment has increased steadily during that time. In the early 2000s, the largest investors have been from the United States (a total of US$12 billion by 2005), the Netherlands, and Britain. Between 2003 and 2005, ChevronTexaco, a major investor since 1993, invested an estimated US$3 billion in Kazakhstan's oil industry. By 2005 foreign investment was responsible for some 85 percent of oil production. However, in 2005 foreign direct investment decreased sharply from US$4 billion to US$1.7 billion as energy companies recognized economic risks of further investment. In the early 2000s, investment also grew rapidly in the consumer goods and transportation and communications industries. In non-energy sectors of heavy industry, Ispat Karmet, the largest steel company, is owned by the Netherlands company Mittal Steel, and the British Kazakhmys company owns Kazakhstan's largest copper processing operation. Russia's investment in Kazakhstan, totaling US$2.2 billion since 1992, has been only in the oil industry and only by the Lukoil company. China's purchase of PetroKazakhstan in 2005 made that country a large-scale investor.

Current investment flows compared to 2000 are shown in the following Table 4.[26] The OECD recommends greater openness to foreign investment in forestry and agricultural land, which could support agricultural development and economic diversification.[27]

Table 5. The flow of foreign direct investment

	2000	2017	2018	2019
Foreign direct investment, net (BoP, current US$)	-1,278,161,529	-3,756,129,608	-4,722,686,549	-5,422,090,834

[26] "World Development Indicators | DataBank," *Databank.worldbank.org*, last modified n.d., accessed Apr 19, 2021, https://databank.worldbank.org/reports.aspx?source=2&series=NY.GDP.PCAP.PP.CD&country=.
[27] OECD, *Reforming Kazakhstan: Progress, Challenges and Opportunities* (n.p.: The OECD, 2017), 67.

Foreign direct investment, net inflows (BoP, current US$)	1,370,521,199	4,712,631,471	83,409,075	3,369,885,001
Foreign direct investment, net inflows (% of GDP)	7.49	2.83	0.05	1.85
Foreign direct investment, net outflows (BoP, current US$)	92,359,670	956,501,862	-4,639,277,475	-2,052,205,833
Foreign direct investment, net outflows (% of GDP)	0.50	0.57	-2.59	-1.13

Labor & taxation

In 2020, the total labor force was estimated at 2,772.6 thousand persons. Of the estimated 2,599.1 thousand persons (93.7 percent) that are the actual number of employees (for the calculation of average earnings).[28] Between 2005 and 2020, the unemployment rate dropped from 8 percent to 4.6 percent. In 2020 the labor force was divided by sectors as follows: 15.8 percent worked in agriculture, 20.5 percent worked in industry and construction, and 63.7 percent worked in the services sector. The skilled labor force is 80.8 % of labor force. Female labor participation rate is 62.7% (ages 15 and older). [29][30]

Tax revenues are low, undiversified, and volatile in Kazakhstan by international standards. The tax mix relies heavily on revenues from value-added tax (VAT) and corporate income tax (CIT) with a lower share of revenues from personal income tax (PIT), social security contributions (SSCs), and property taxes. CIT and VAT revenues are generated by a relatively small group of large firms and in a small set of sectors. Important sources of tax revenue, such as CIT and export duties on crude oil, rely on the extractive sectors such as mining and fossil fuels. Furthermore, CIT revenues are sensitive to the international oil price and VAT revenue volatility has increased in recent years.

[28] Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics, *Socio-economic development of the Republic of Kazakhstan January 2021* (Nur-Sultan: The Agency for Strategic planning and reforms of the Republic of Kazakhstan Bureau of National statistics, 2021), 30.

[29] "Human Development Reports," *Hdr.undp.org*, last modified n.d., accessed Apr 19, 2021, http://hdr.undp.org/en/countries/profiles/KAZ.

[30] UNHCR, *COUNTRY PROFILE: KAZAKHSTAN* (n.p.: The UNHCR, 2006), 9-10.

Personal capital income, such as dividends and capital gains, is mostly exempt from tax in Kazakhstan. Where tax does apply, the rates are low. Some of the exemptions on personal capital income could be removed and a single low rate or a progressive rate could be applied across all forms of personal capital income (either by taxing capital income jointly with labor income or by applying a separate progressive rate schedule on personal capital income).

Corporate income tax revenues are generated by a small number of companies and sectors and there are many corporate tax incentives. Scope exists to broaden the CIT base while maintaining the 20% CIT rate at its current level. The business economy can be characterized as having a dual economic structure, split into large firms and small firms. A small group of about 500 large companies dominates the economy, producing half of all company turnover and employment. At the same time, there is widespread small-scale self-employment and SMEs with low incomes. CIT revenues are high as a share of total tax revenues compared to the OECD average, partly because more than one-third of CIT revenues is paid by oil companies. Beyond CIT, a range of additional taxes apply to companies operating in the extractive sectors (including Mineral Extraction Tax, Excess Profit Tax, and others), which go to the National Fund. In addition to oil tax revenues, there are also oil non-tax revenues (such as the share of production under concluded contracts).

Kazakhstan offers many generous tax incentives to companies that come at a significant tax revenue cost. Companies that implement a "priority investment project" under one of the priority areas (as defined by the authorities) that invest in a new production facility could be exempt from CIT and land tax for up to 10 years and the property tax for up to 8 years. Furthermore, in SEZs, which were established in Kazakhstan to support the development of economic sectors other than natural resources, companies can benefit from a reduction in CIT, property tax, and land tax by up to 100%.[31]

Infrastructures

Roads: The transportation infrastructure does not meet the needs of a vast country whose per-capita volume of road and railroad shipping is one of the highest in the world. In 2005, Kazakhstan had about 90,000 kilometers of roads, 84,100 kilometers of which were hard surfaces. Of the 23,000 kilometers of main highways, an estimated two-thirds are in poor condition. The major artery, the 1,222-kilometer road between Astana and Almaty, was rehabilitated in the early 2000s with funding from three international banks. With assistance from the European Bank for Reconstruction and Development, another important highway is being completed along the Caspian coast between Turkmenbashi in Turkmenistan and Astrakhan in Russia, serving Kazakhstan's western oil outposts. There are 46 road crossings on the border with Russia, seven each on the borders with Kyrgyzstan and Uzbekistan, and six on the border with China. Spurred

[31] "OECD Tax Policy Reviews: Kazakhstan 2020," *Oecd-ilibrary.org*, last modified n.d., accessed Apr 19, 2021, https://www.oecd-ilibrary.org/sites/872d016c-en/index.html?itemId=/content/publication/872d016c-en.

by income from oil, ownership of private vehicles increased sharply in the early 2000s, albeit from a very low starting point.

Railroads: In 2005 Kazakhstan had an estimated 14,200 kilometers of the rail line, of which about 4,000 kilometers were electrified. The infrastructure of the railroad system is in poor condition, although Kazakhstan still moves nearly 75 percent of its freight and 50 percent of its passengers by rail. Using foreign funds, state-owned Kazakhstan Railways has undertaken a three-year infrastructure improvement program, and its passenger service was reorganized in 2006. The system is concentrated in the northern part of the country, where it connects with lines in southern Russia. Lines also run northeast from Almaty to join the Trans-Siberian Railroad in Russia and westward from Almaty to Shymkent and then into European Russia. The main connector with Uzbekistan runs into Shymkent. A rail line connects Druzhba, on Kazakhstan's eastern border, with China via the Alataw Shankou Pass. Almaty also planned to build a 35-kilometer subway line.

Ports: Kazakhstan's major ports are the cities of Aqtau and Atyrau on the Caspian Sea and the Irtysh River ports of Öskemen, Pavlodar, and Semey, which serve the northeastern industrial sector. Beginning in 1999, Aqtau was upgraded, to handle 7.5 million tons of oil and 1 million tons of freight per year. A new ferry port opened in Aqtau in 2001 added substantially to its capacity and established ferry connections with Azerbaijan, Iran, and Russia.

Inland Waterways: Although Kazakhstan has about 4,000 kilometers of inland waterways, 80 percent of river traffic uses the Irtysh River. Eleven companies carry traffic through the system. 10.0% of the population is exposed to unsafe drinking water.

Civil Aviation and Airports: In 2006 some 16 major airports and 51 smaller paved-runway airports served Kazakhstan. Nine had runways longer than 3,000 meters. Three, at Almaty, Aqtau, and Atyrau, offered international flights. In 2006, a fourth international airport was planned to serve western Kazakhstan. Flights from Almaty connect with Russia, other former Soviet republics, and some destinations in Europe, Asia, and the Middle East. The development of Kazakhstan's airline service has suffered from political struggles over control of the industry. The government has contracted management of some airports to foreign companies, and in the early 2000s, foreign companies began competing with domestic airlines. In 2002, one-third of Kazakhstan's air companies lost their licenses because of lax safety practices, and many companies merged thereafter. Air Kazakhstan, the state airline, declared bankruptcy in 2004, making its competitor Air Astana the main domestic airline. The Atyrau airport is scheduled for upgrading with funding from the European Bank for Reconstruction and Development.

Pipelines: Because Kazakhstan is a vast country producing large amounts of oil and natural gas, pipelines receive high priority in transportation planning, and their location and funding have been controversial issues. In 2006 Kazakhstan had 11,019 kilometers of natural gas pipeline, 10,338 kilometers of the oil pipeline, 1,095 kilometers of pipeline for refined products, and 658 kilometers for gas condensate. Poor management and distribution of the domestic pipeline system have necessitated the importation of natural gas, and foreign investment has concentrated on export

lines. Kazakhstan is linked to the Russian pipeline system by the Atyrau–Samara line, whose capacity was increased in 2001, and to Russia's Black Sea oil terminal at Novorossiysk by the Caspian Pipeline Consortium line. The Central Asia Oil Pipeline sends oil from Kazakhstan through Turkmenistan and Afghanistan to Pakistan's Arabian Sea port of Gwadar. In late 2005, the Atasu–Alashankou oil pipeline was completed between eastern Kazakhstan and Xinjiang Province in China. That 970-kilometer line has a capacity of 20 million tons per year. In 2006 work was underway to extend that line from Atasu to Atyrau on the Caspian Sea, making the total length 2,900 kilometers.

Telecommunications: Access to electricity is available for the entire population. Although Kazakhstan has the best telephone system in Central Asia, the system rates poorly by world standards. Attempts to attract foreign investment have largely failed. The state-owned national telecommunications company, Kazakhtelcom, has received assistance from the European Bank for Reconstruction and Development in a nationwide program of expansion and modernization. The company relinquished its monopoly control of international and long-distance telephony in 2005, and several companies now compete in those markets. The June 2006 launch of the KazSat communications satellite from the Baykonur space platform, with Russian technical assistance, was expected to reduce the dependence of all the Central Asian countries on European and U.S. telecommunications satellites. The launch of a second KazSat was planned for 2009. Most users access the Internet at public or work facilities. Usage is concentrated in the northern urban centers.[32] As of 2020, 77.6 people per 100 people subscribed to mobile broadband, and 13.4 people per 100 people subscribed to fixed- broadband Internet.

In 2020, the quality of the overall infrastructure is 68.3 (0-100 best) (Figure 2).

[32] UNHCR, *COUNTRY PROFILE: KAZAKHSTAN* (n.p.: The UNHCR, 2006), 11-13.

Figure 1. Comparison of the Asia average and Kazakhstan's infrastructure scale

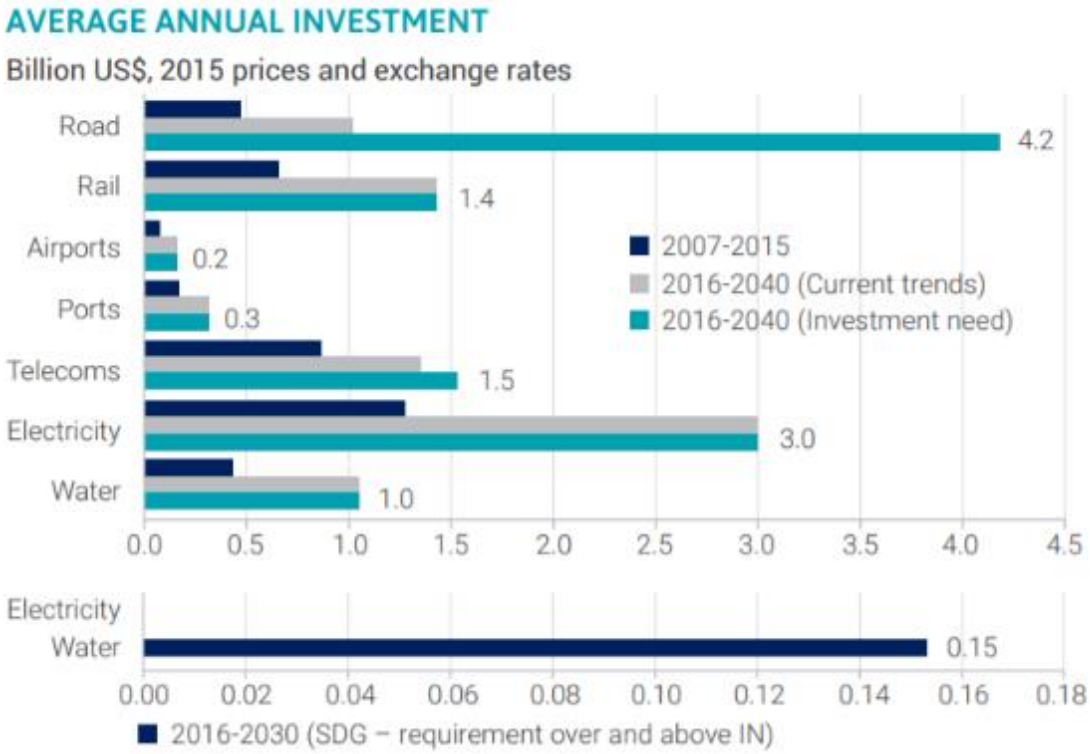

Figure 2. Average annual investment

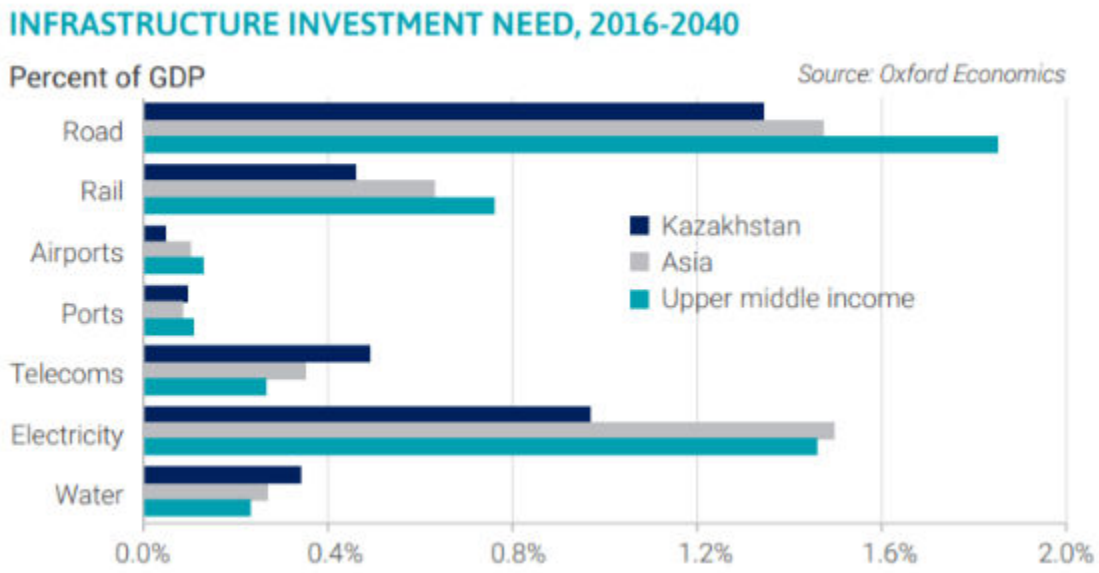

Figure 3. Infrastructure investment as a percentage of GDP[33]

Figure 4. Infrastructure Compass in Kazakhstan

[33] Global Infrastructure Hub, *COUNTRY PROFILE: KAZAKHSTAN* (Sydney: The Global Infrastructure Hub, n.d.), 1.

The three strength of Kazakhstan's infrastructure is: (Figure 5)

1. Cost to Start a Business

   According to the World Bank, the cost to start a business in Kazakhstan is 0.2% of income per capita, easing the entry of new firms.

2. Registering Property

   According to the World Bank, it takes 4.5 days to register a property in Kazakhstan, lower than the Upper Middle Income Countries' average of 20 days. In 2019, Kazakhstan reviewed the process to register a property and decreased the cost of registration fees.

3. Strength of Insolvency Framework

   Reforms to modernize Kazakhstan's insolvency framework were implemented in 2014, resulting in a score higher than the Upper Middle Income Countries' average of 63. Strong insolvency protections help attract companies to invest locally.

Growth opportunities are as follows: (Figure 5)

1. Post-Completion Reviews

   Kazakhstan does not undertake post-completion reviews for infrastructure projects. The implementation of post-completion reviews could help determine whether projects have achieved their objectives efficiently, and better identify areas for improvement.

2. Environmental Impact Analysis

   According to the World Bank, Kazakhstan does not have a regulated requirement for environmental impact assessment. Undertaking environmental feasibility studies can help countries understand and balance environmental and infrastructure outcomes.

3. Value of Close Infrastructure Deals with Foreign Equity Sponsorship

   Kazakhstan had 0.02% of GDP in deals with foreign equity over the last five years, lower than the Upper Middle Income Countries' average of 0.14%. Kazakhstan is working to increase this, launching the Astana International Financial Centre in 2018 to facilitate an increased flow of foreign capital.[34]

[34]"Kazakhstan," *Infracompass.gihub.org*, last modified n.d., accessed Apr 19, 2021, https://infracompass.gihub.org/ind_country_profile/kaz/.

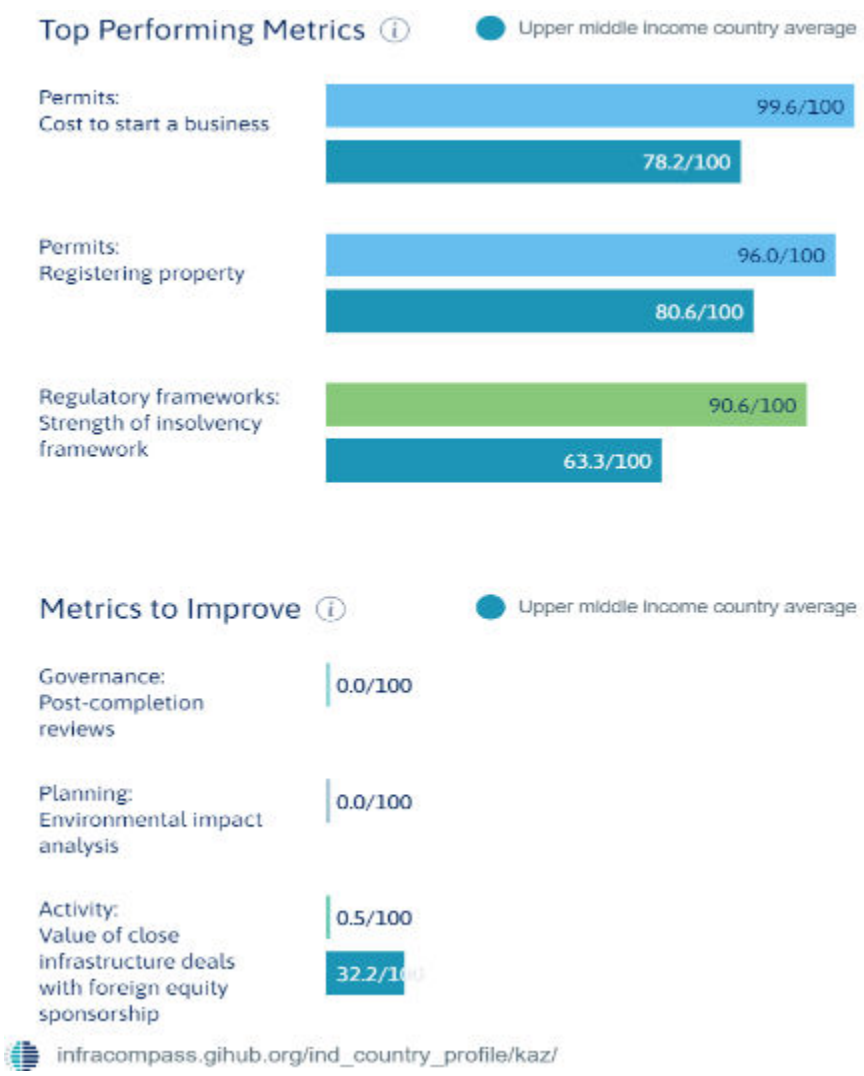

Figure 5. Kazakhstan's strength compared to the average of similar countries

2.6 Climate and Biodiversity

Climate

The diversity of geological and geomorphologic climatic and vegetative-ground conditions of Kazakhstan's territory provides a variety of landscapes. Natural vegetation zones (i.e. forest steppes, prairies, semi-deserts, and deserts) occur with an increase in solar radiation from north to south proportionate to the decrease in rainfall. The territory of Kazakhstan in the south is part of the "Variable Zone". The climate is highly continental with considerably colder winters and hotter summers than is the case at the same latitudes of Eastern Europe. The coldest month is January and the warmest one is July. The hours of sunlight range from 2, 000 hours in the north up to 3, 000 hours in the south. Radiation increases southerly from 100 kcal/sm^2 to 140 kcal/sm^2. The average temperature in January, the coldest month, varies between -5°C in the extreme south and

-20°C in the north. In the plains of Kazakhstan, the average July temperature varies between +18°C in the north and +29°C in the south. Vegetation growth occurs for 190 - 200 days in the north and 230-290 days in the south. The whole territory of Kazakhstan is characterized by strong winds. In the winter, southwesterly winds prevail in the north, while the south has eastern winds. In summer northern winds dominate everywhere. In the forest-steppe the average precipitation is 300-400 mm per year., whilst in the steppe, this falls to 250 mm. In the Kazakh small hills, this increases to 300-400 mm, and in the semi-deserts and deserts, this falls to 100 - 200 mm. Particularly low precipitation (less than 100 mm per year) occurs in Pribalkhsye, in south-eastern part of Aral Sea Kyzylkum and southern Ustyurt. Between 400 to 1, 600 mm of precipitation per year falls in the foothills and mountains. In the north and center the maximum rainfall occurs in the summer months, and the south, in early spring. In Kazakhstan (except for its mountain part) the annual rainfall is several times less than what could be evaporated, resulting in a considerable moisture deficit. Such a dry climate provides the conditions for the predominance of desert and semi-desert landscapes and requires artificial irrigation for cultivating crops. [35] [36]

Biodiversity

Four major ecological systems can be defined: forest (2% of the country), steppe (28%), desert (32%), and mountain (7%). The rest comprises pastures (8%), fallow lands (4%), and agricultural land. 7 types are established for the mountain systems: nival, mountain meadow, forest, forest-steppe, steppe, semi-desert, and desert. Kazakhstan is endowed with an enormous diversity of mountain ecological systems due to the high altitude zones. By the zone structure and the set of typical and rare ecological systems, four large mountain blocks can be specified: Western- Tien Shan (the mountains of Karatau and Western Tien Shan), Northern Tien Shan, Kazakhstan-Dzhungar, and the Altai ranges. The mountains significantly affect the adjacent foothill plains, where special inversion types of the ecological systems are concentrated, such as foothill deserts in the south of Kazakhstan. In general, the diversity and originality of the flora and fauna in steppe and desert zones increase from west to east. However, in mountain systems, an increase takes place from the northeast (Altai) to the southwest (West Tien- Shan, Karatau). [37]

Over 6,000 species of higher vascular plants, of which 14 percent are endemic species, 5,000 species of mushrooms, 485 species of lichens, 2,000 species of seaweeds, 178 mammal species, 489 bird species, 12 amphibian species, and 104 fish species can be found in Kazakhstan. Mushrooms have a very high rate of endemism (3 endemic genus and 124 endemic species are found in the country). Fossil flora and fauna are also very rich; the Chu-Iliski mountains contain

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[35] Valeriy Meshkov et al., "Forest Rehabilitation in Kazakhstan," *IUFRO World Series* 20 no.4 (2009): 83-130.

[36] Ministry of Natural Resources and Protection of Environment of the Republic of Kazakhstan, *National Strategy and Action Plan on Conservation and Sustainable Use of Biological Diversity in the Republic of Kazakhstan* (Kokshetau: The Ministry of Natural Resources and Protection of Environment of the Republic of Kazakhstan, 1999), 10.

[37] Ministry of Natural Resources and Protection of Environment of the Republic of Kazakhstan, *National Strategy and Action Plan on Conservation and Sustainable Use of Biological Diversity in the Republic of Kazakhstan* (Kokshetau: The Ministry of Natural Resources and Protection of Environment of the Republic of Kazakhstan, 1999), 14.

the oldest fossils (dating back 420 million years) discovered on Earth and are thus an important witness to the beginnings of flora on the planet. Many species are endangered, mostly due to habitat destruction and hunting. The Red Data Book of Kazakhstan lists 125 species of vertebrates (15%), 96 species of invertebrates, 287 species of higher plants (4.8%), and 85 species of insects. Rare, hoofed animals, despite improved protection quality, are still declining, and the situation is generally critical for many species. These include the Tran Caspian argali (*ovis vignel argali*), the Kazakhstan argali (*ovis ammon collium*), saigas (*antelopes*), and gazelles. Poaching is the main cause of this rapid decline.[38] Examples of rare and endangered animal species include European mink (Mustela lutreola), red wolf (*Cuon alpinus*), lynx (*Felis lynx*), Tien-Shan brown bear (*Ursus arctos isabellinus*), honey badger (*Mellivora capensis*), caracal (*Lynx caracal*), onager (*Equus hemmionus onager*), ounce (*Unica unica*) stone marten (*Martes foina*), relict gull (*Larus relictus*), osprey (*Pandion haliaeetus*), and saker falcon (*Falco cherrug*).[39]

Figure 7 shows the population trends of four major protected species in Kazakhstan. The population size is expressed as the number of adults in a given area (thousands of individuals, thousands of heads. [40]

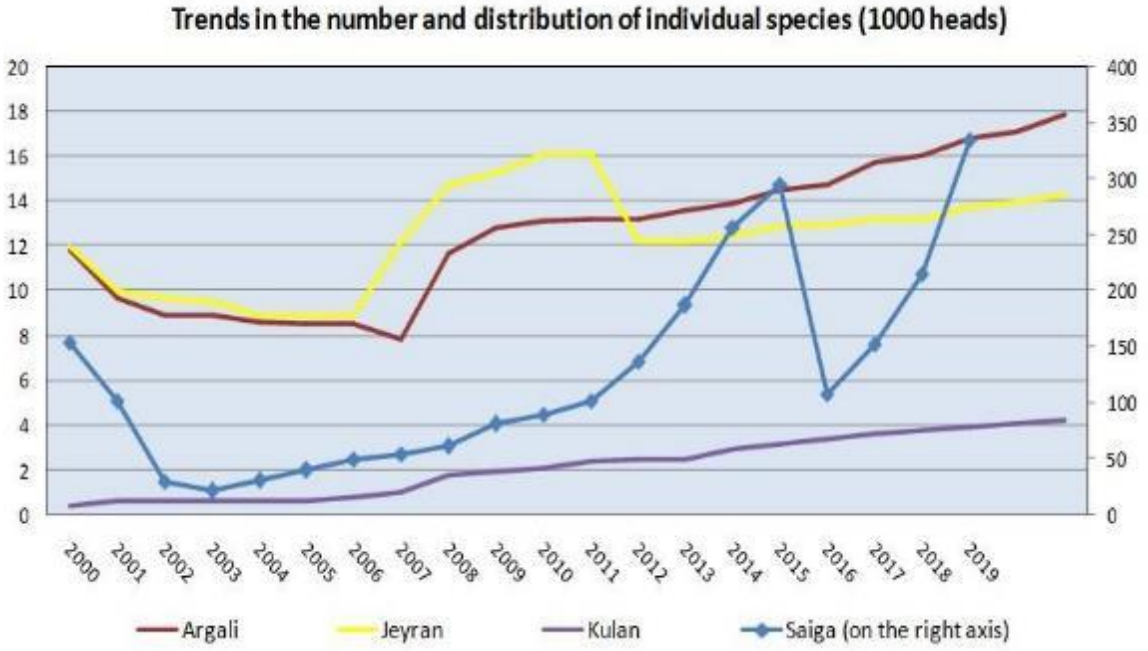

Figure 6. Population trends of four major protected species

[38] "Main Details," *Cbd.int*, last modified n.d., accessed Apr 19, 2021, https://www.cbd.int/countries/profile/?country=kz.
[39] "Countries," *Fao.org*, last modified n.d., accessed Apr 19, 2021, http://www.fao.org/forestry/country/57478/en/kaz/.
[40] "Trends in the number and distribution of selected species," *Stat.gov.kz*, last modified n.d., accessed Apr 19, 2021, https://stat.gov.kz/ecologic/trends_in_the_number_and_distribution_of_selected_species.

Figure 6 describes the number and number of populations of species-by-species groups that are threatened with extinction at the national and global levels, as well as those that are protected in the country. The unit of measurement is the number of species and the number of adults in units, as well as a percentage indicator for trends. [41]

Box 2: Definition of Endangered species and Protected species by the CFW

1. Endangered species

   "Species whose population has decreased to a critical level in such a way that they may soon become extinct. These include "critically endangered species", "endangered species", and "vulnerable species**". Critically endangered species are species that are at extremely high risk of extinction in the wild."*

   A. *Endangered species

      "Species that are not currently in a "critical condition", but maybe at very high risk of extinction in the wild in the near future."

   B. **Vulnerable species

      "Species that do not belong to the category of "critical" or "dangerous" species, but in the medium term may fall into the category with a high risk of extinction in the wild."

2. Protected species

   "Species that are protected under national legislation."

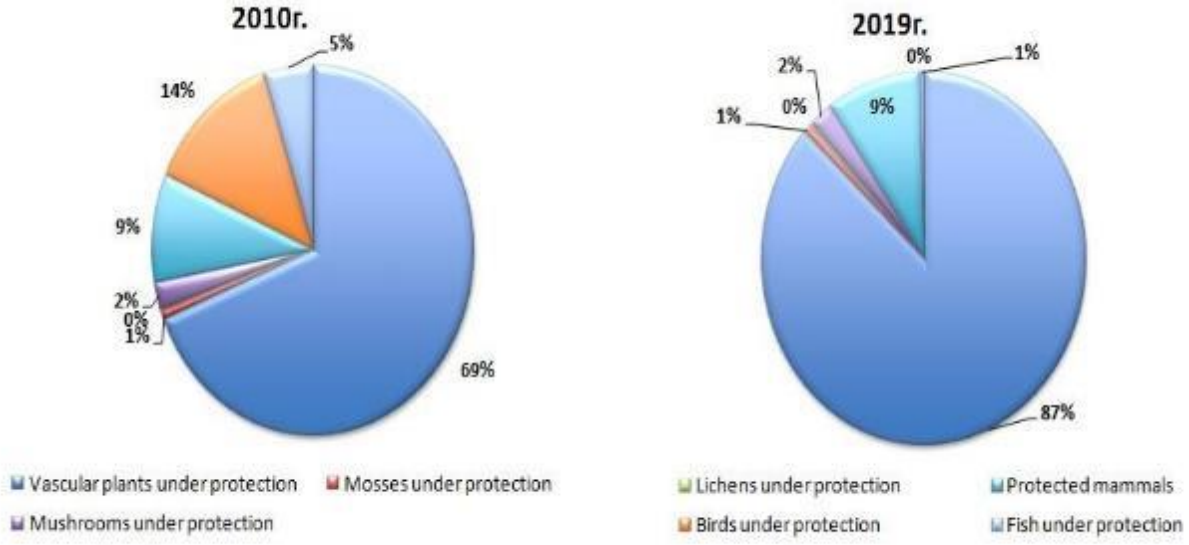

Figure 7. Threatened and protected species

[41] "Threatened and protected species," *Stat.gov.kz*, last modified n.d., accessed Apr 19, 2021, https://stat.gov.kz/ecologic/threatened_and_protected_species.

3. Major Trends and Issues in Forest and Forestry

3.1. State of Forest

3.1.1 Land Use and Forest Cover

Box 3: Definition of Forest fund and Private Forest by the Constitution of the Republic of Kazakhstan [42]

Forest fund

"The Constitution of the Republic of Kazakhstan (1995) designates forests as a type of natural resource that are property of the state. Consequently, as enforced by orders if the President and by national legislation such as the land and forest legislation, and legislation on specially protected natural areas, lands of the forest fund, flora (including forests) and fauna, as well as specially protected natural territories, shall not be privatized."

Private forest estate

"This is meant to promote creation and maintenance of manmade forests and shelterbelts on privatized farmland, as it would legally allow such newly forested lands to be gazetted as forest estate, effectively waiving assessment of property tax on these otherwise nonproductive no-man's lands; elimination of noncompetitive short-term forest use contracts (only contracts for 10 or more years would be allowed, with allocation on a strictly competitive tender basis); mandatory requirement for all commercial forest harvesting operators to be subject to licensing."

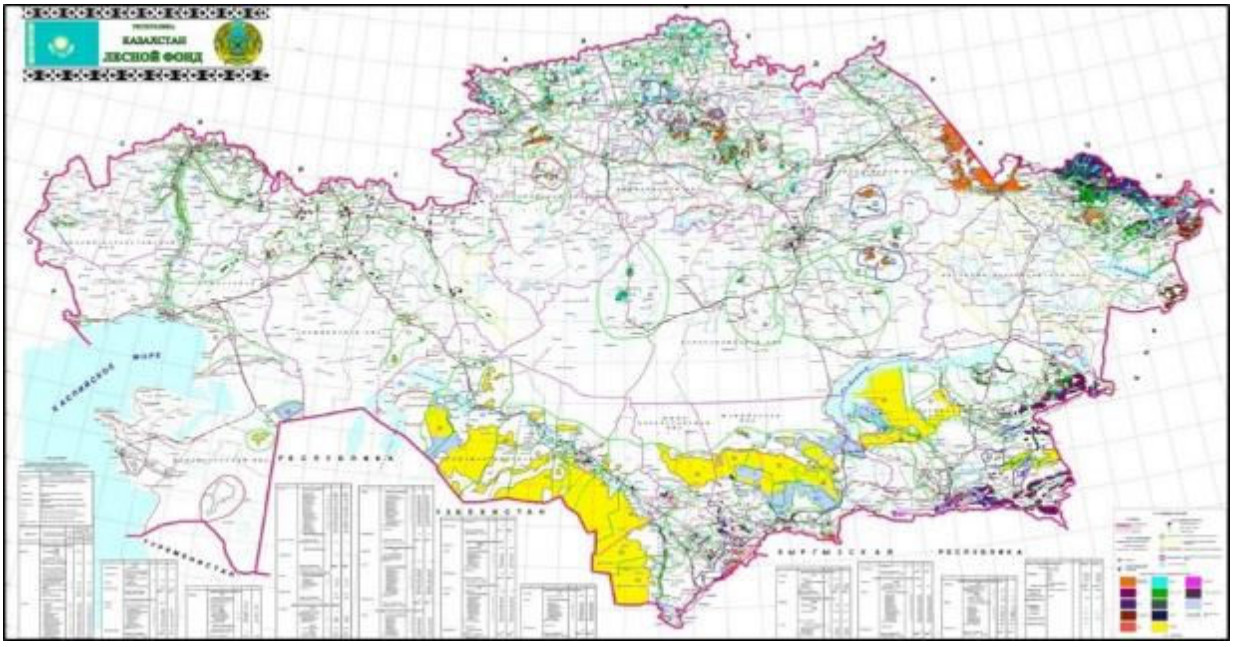

Figure 8. State forest fund area in Kazakhstan marked by the colored areas (Global Environmental Facility, 2016)

[42] Andrey Kushlin, Tjaart Schillhorn Van Veen and William Sutton, *Kazakhstan-Forest Sector in Transition: The Resource, the Users and Sustainable Use* (Astana: The World Bank, 2010), 30-31.

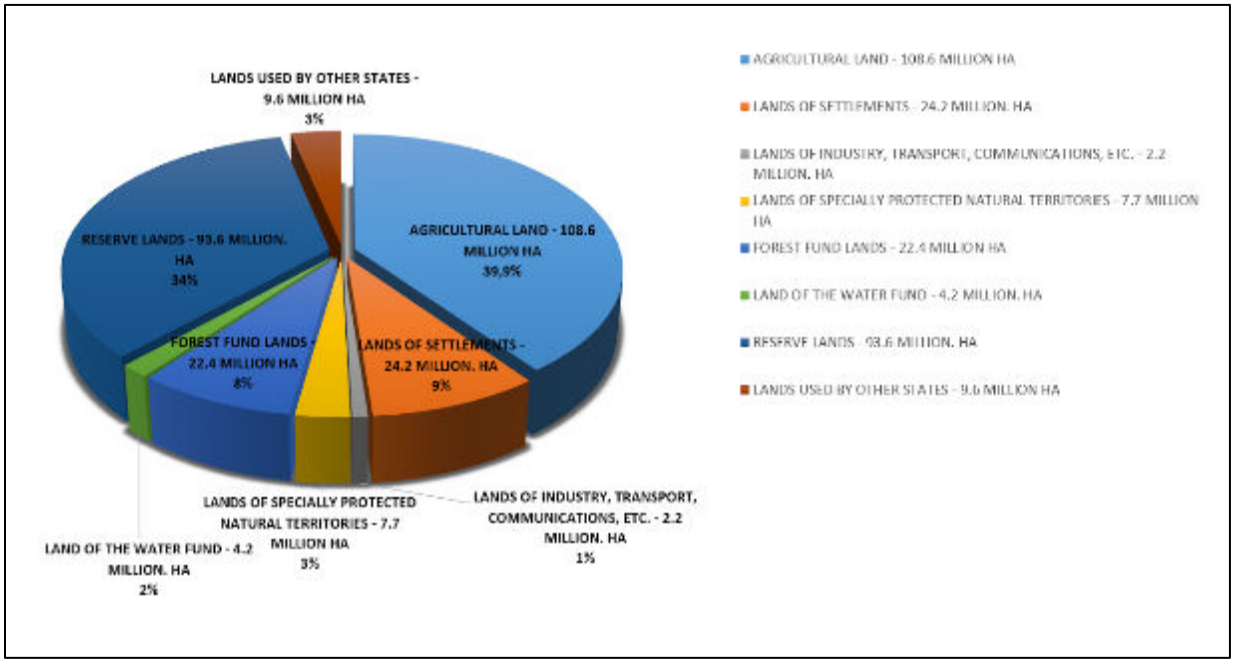

Figure 9. The territory of Kazakhstan

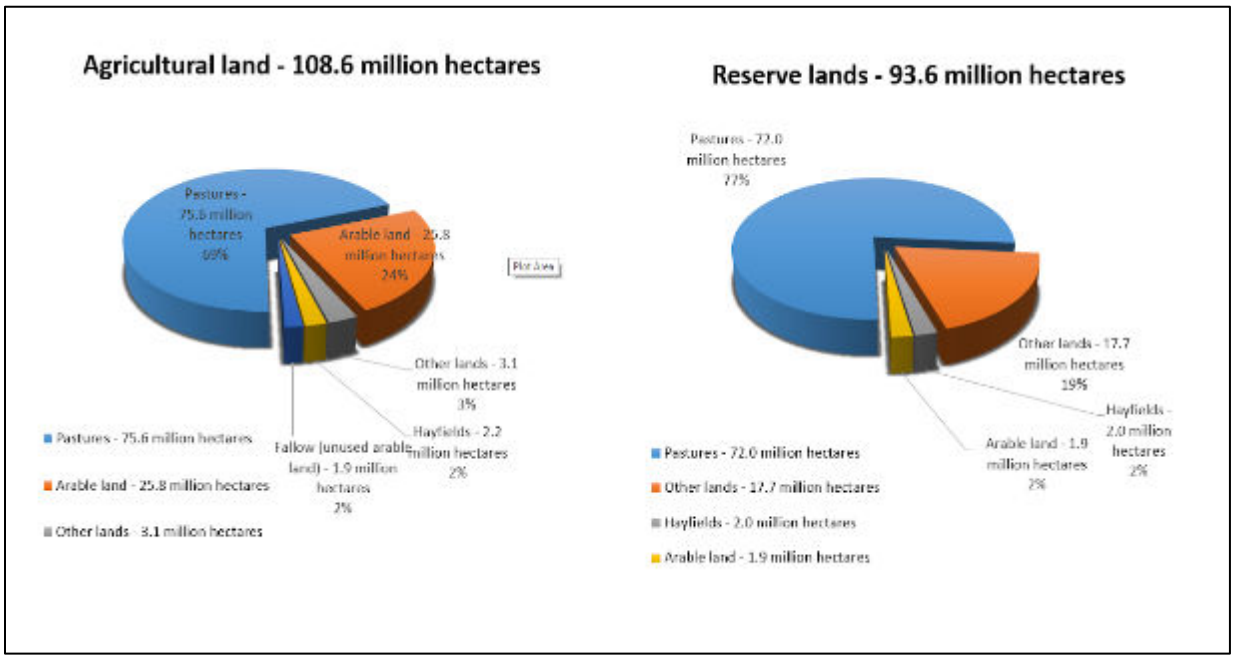

Figure 10. Distribution of agricultural lands and reserve lands

Table 6. The distribution of the land fund of the composition of land[43]

		2015	2016	2017	2018	2019
Total area (in thousand hectares)		272,490	272,490	272,490	272,490	272,490
Including (in thousand hectares)	arable land	24,935	24,795	25,243	25,813	26,011
	perennial plantations	151	152	151	148	147
	deposits	4,798	4,980	4,547	4,067	3,978
	hayfields	5,131	5,125	5,138	5,135	5,133
	pastures	186,527	186,468	186,425	186,156	184,464
	forest area	13,682	13,690	13,693	13,737	15,331
	swamps	1,135	1,135	1,136	1,142	1,138
	underwater	7,712	7,712	7,711	7,644	7,655
	other	28,419	28,435	28,448	28,648	24,634

[43] Aydapkelov N.S., *Environmental protection in the Republic of Kazakhstan 2015-2019* (Nur-Sultan: Agency for Strategic planning and reforms of the Republic of Kazakhstan, Bureau of National statistics, 2020), 74.

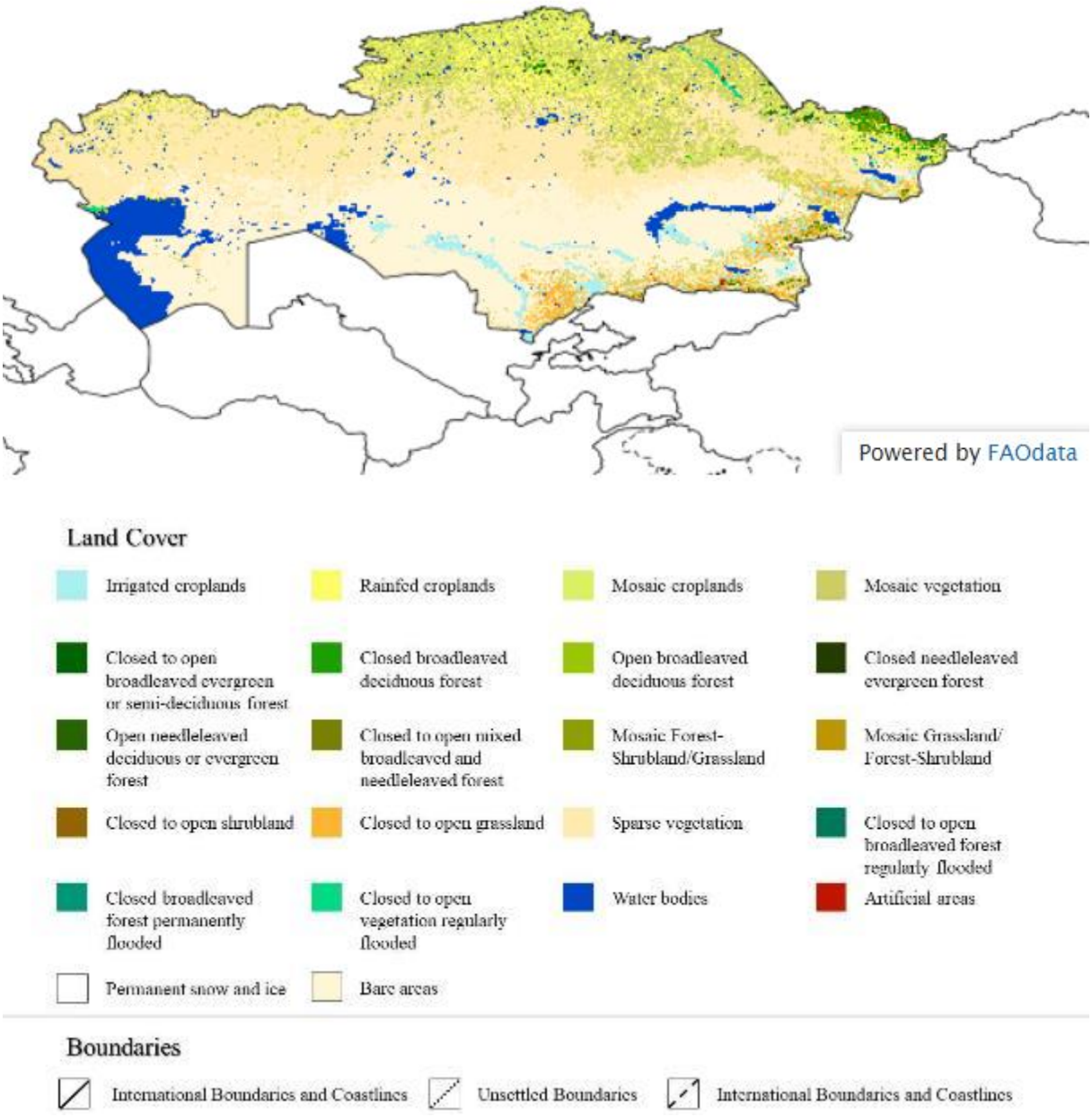

Figure 11. Land cover map with legends [44]

Forest Area

Kazakhstan belongs to the states with low forest cover. Forests cover 4.9% of its territory, and this is with due regard to saxaul plantations, which account for almost half of the forested area.

[44] "FAO Country Profiles:Kazakhstan," *Fao.org*, last modified n.d., accessed Apr 19, 2021, http://www.fao.org/countryprofiles/maps/map/en/?iso3=KAZ&mapID=609.

The total area of the state forest fund (hereinafter referred to as the state forest fund) as of 01.01.2021 is 30047.7 thousand hectares and occupies 11.0% of the territory of the republic. Forested lands occupy 13316.9 thousand hectares or 44.3% of the total area of the forest fund. The area of the private forest fund is 1013 hectares, there are no forested lands. The forest cover of the republic is 4.9 percent.

Most of the state forest fund - 74.7% is under the jurisdiction of the akimats of the regions, 24.6% is under the jurisdiction of the Forestry and Wildlife Committee (Committee).

The area of state forest owners subordinate to the Committee is 7392.0 thousand hectares, of which 7277.0 thousand hectares are specially protected natural territories with the status of a legal entity (hereinafter - protected areas), which include: – 3124.3 thousand hectares.

In addition, the Committee is subordinate to: RSE "Republican Forest Breeding and Seed Center" - 1.7 thousand hectares, Sandyktau educational and production forestry - 25.9 thousand hectares and RSE "Zhasyl Aimak" - 87.4 thousand hectares. The akimats of the regions are responsible for 120 state forestry institutions, the area of which is 22445.5 thousand hectares, "Syrdarya-Turkestan State Regional Natural Park" of the akimat of the Turkestan region with an area of 120.0 thousand hectares. Under the jurisdiction of the Office of the President of the Republic of Kazakhstan is the State Enterprise "Burabay" – 129.3 thousand. ga; The Ministry of Agriculture of the Republic of Kazakhstan is responsible for the limited liability partnership "Kazakh Research Institute of Forestry and Agroforestry" of the non-commercial joint stock company "National Agrarian Scientific and Educational Center" of the Ministry of Agriculture of the Republic of Kazakhstan (hereinafter "KazNIILHA" LLP NAO "NANOC" of the Ministry of Agriculture of the Republic of Kazakhstan) – 14 hectares;

Under the jurisdiction of the Ministry of Industry and Infrastructure Development of the Republic of Kazakhstan are: protective plantings on the right-of-way lanes of railways of JSC "NC "Kazakhstan "Temir Zholy– - 64.2 thousand. 11 protective plantings on the right-of-way lanes of JSC NC KazAvtoZhol – 15.7 thousand hectares. The total area of forest institutions of protected areas in the republic is 10891.8 thousand. ha, which include specially protected forest territories of institutions under the jurisdiction of the Committee, as well as the State Enterprise "Burabai" of the Office of the President of the Republic of Kazakhstan and "Syrdarya-Turkestan State Regional Natural Park" of the Akimat of South Kazakhstan region.

The area of the private forest fund in the republic is 1013 hectares - this is "State of emergency Kolosovsky A.P." - 421 hectares, "State of emergency Kolosovsky.A".- 250 ha, "State of emergency Kolosovsky S.A.".- 250 ha, "Zelenstroy" IP "Adaykin Yu.Yu.–- 37 ha, LLP "Baishuak-Umit" Zhaulieva R.T. - 25 ha, IP "Karpovich A.N." - 6 ha, LLP "KOKTEREK-A" - formed AP-ka again and ha in 2012 – 17 ha.

(Information on the status and dynamics of the forest fund of the Republic of Kazakhstan as of 01.01.2021 Almaty 2021 11- 12 p)

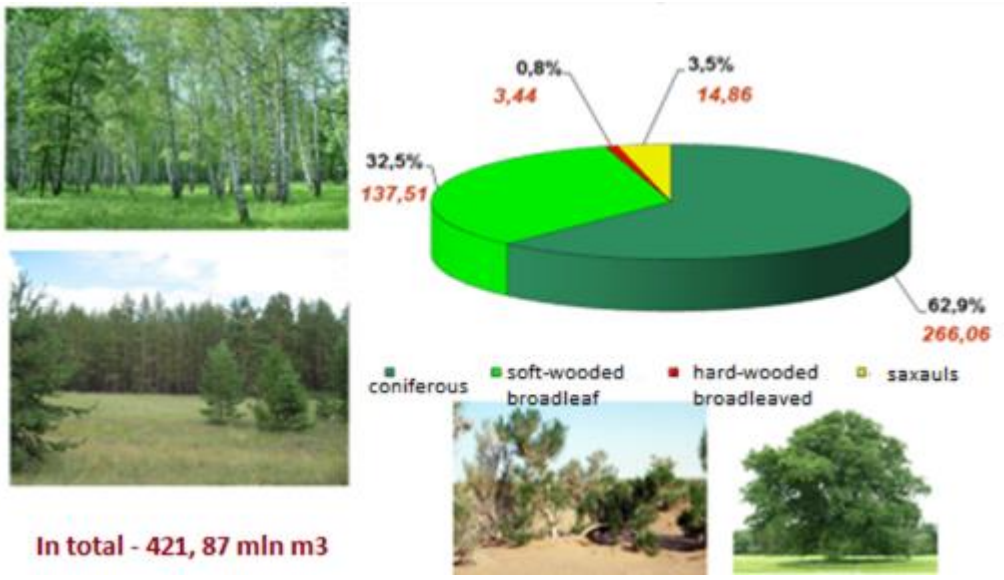

Figure 12. Distribution of total forest density of the state forest fund by groups of main forest forming species (2018)

3.1.2 Forest Use Categories

Box 4: Definition of Protected Areas by the CFW

"Areas of land, water surface and air space over them where natural complexes and objects that have special environmental, scientific, cultural, aesthetic, recreational and improving value which are withdrawn by decisions of public authorities fully or partly from economic use and for which a special protection regime."

All forests in the Republic of Kazakhstan are protected. The forest under long-term management plans have been established is 100% (Table 12).[45] They perform important water-protective, field-and soil conservation, sanitation, health, and other useful functions. About 10 percent of all forests in Kazakhstan were created, by the forestry authorities during Soviet times, for protection against wind erosion and sand drifts. In this regard, the forest fund category "field and forest conservation" dominates and makes 9.8 million ha or 79% of the total wooded area.[46] Coverage by protected areas of important sites for mountain biodiversity is 20% in 2020. [47]

[45]United Nations, *State of Forests of the Caucasus and Central Asia* (New York and Geneva: The UN, 2019), 87.

[46] Arcady Radionov, *The States of Forest Genetic Resources in the Sec Region, The Republic of Kazakhstan Country Report* (Ankara: The FAO, 2013), 5.

[47] "Indicator 15.4.1 - Coverage by protected areas of important sites for mountain biodiversity - Indicators For The Sustainable Development Goals," *Kazstat.github.io*, last modified n.d., accessed Apr 19, 2021, https://kazstat.github.io/sdg-site-kazstat/en/15-4-1/.

Table 12: Forest Area within Protected Areas and Forest Area with Long-Term Management Plans[48]

	2016	2017	2018	2019	2020
Forest area within protected areas (in thousand ha)	1,079.40	1,079.40	1,121.80	1,121.80	1,121.80
Forest area with long-term forest management plan (in thousand ha)	3,337.71	3,366.96	3,396.20	3,425.44	3,454.68
Forest area with long-term forest management plan of which is the protected area (in thousand ha)	1,079.40	1,079.40	1,121.80	1,121.80	1,121.80

Table 13: Designated Management Objective

	Area (in thousand ha)
	2020
Total	3,454.68
Production	0.00
Protection of soil and water	2,160.30
Conservation of biodiversity	1,121.80
Social Services	0.00
Multiple-use	0.00
Other	172.58
None/unknown	0.00

100% of Kazakhstan's forests are publicly owned. 79.2% of the lands of the forest fund are administered by the regional authorities (Akimats of administrative regions), 20.1% are in the conduct of the national forestry committee and 0.7 % are owned by other national agencies. The State Forest fund lands include land covered with forests and land which are not forested but designed for the needs of the forestry sector.[49] Overall, forests managed by state forest agencies account for 22.[50]

3.1.3 Main Drivers of Forest Changes

The main factors that make forests vulnerable are forest fires and illegal logging.

Forest protection from fires

[48] FAO, *Global Forest Resources Assessment 2020* (Rome: The FAO, 2020), 36.

[49] Arcady Radionov, *The States of Forest Genetic Resources in the Sec Region, The Republic of Kazakhstan Country Report* (Ankara: The FAO, 2013), 8.

[50] United Nations, *State of Forests of the Caucasus and Central Asia* (New York and Geneva: The UN, 2019), 31.

Numbers of forest fires have tended to decrease in recent years, though there has been a rise in the area damaged. In 2018, 228 fires damaged 120,990 ha (average size 338 ha), which is nine times higher than in 2017, when 563 fires damaged 13,368 ha (average 24 ha).
The largest individual fires in state forests were in Zhambyl (146,461 ha), Kostanay (3,109 ha) and Turkestan (3,939 ha) regions and in the Naurzum State Nature Reserve (8,085 ha), Semey Ormany (299 ha) and Yertis Ormany (114 ha) State Forest Natural Reserves (SFNR).
The average size of forest fires has been increasing. From 2013-2018, the average was 78 ha. This reflects the slow discovery of fires and the time taken to deliver fire-fighting resources to the sites of fire outbreaks.
To receive and transmit information about forest fires promptly, and to coordinate fire-fighting measures, the Republic Dispatch Service was organized at the "Kazavialesoohrana" republic state-budget-supported enterprise, which then transferred the information to the Republic Crisis Centre of the Committee for Emergency Situations of the Ministry of Internal Affairs.
Aerial observation of forests is carried out in Almaty, Akmola, East Kazakhstan, Zhambyl, Karaganda, Kostanay and Pavlodar regions on 8.9 million hectares (30% of the State Forest Fund territory), which complies with current regulations (order of the Minister of Agriculture of the Republic of Kazakhstan dated 07.20.2015 No. 18-02 / 664). The FWC plans to extend aerial observation to forests in West Kazakhstan, Turkestan and Kyzylorda.
Under national legislation, local executive bodies are responsible for putting out steppe fires in their administrative territory. For this purpose, rural and district akimats create voluntary fire groups to supplement official emergency units.
A pilot Forestry Fire Management Information System (ISCCF) for combating forest fires, based on an optical-sensory system for early detection of natural fires with internet data transmission has been trialed in the Semey Ormany State Forest Natural Reserve. The pilot project operated from 2011 - 2019, during which time the average fire size was reduced to 0.5 ha, compared with an average 17.3 ha over the period 2004 – 2010, before the pilot.
To monitor forest fires and illegal logging, the FWC concludes an agreement every year with JSC National Company, Kazakhstan Garysh Sapary for the provision of satellite imagery from a Kazakhstan satellite. The images must first be cleared by the Ministry of Defence, meaning that there are delays in passing them to the FWC. The quality can also be an issue, particularly when it is cloudy.
To prevent the spread of forest and steppe fires across the international border, the governments of Kazakhstan and the Russian Federation signed an agreement to prevent and extinguish forest and steppe fires in the border areas. Kazakhstan has signed similar agreements with the member states of the Commonwealth of Independent States. The involvement of the state fire service of the Ministry of the Interior in putting out fires on the territory of the State Forest Fund is regulated by a special agreement.

Illegal logging in the State Forest Fund

Illegal logging is a serious problem. Since January 2018, 419 cases have been recorded, involving 28,553 m³ of timber, and resulting in $2.2 million (948 million tenge) of damage:
• In forests managed by regional akimats and other state forest owners, there were 341 cases, involving 3103 m³, and causing damage estimated at $80,000 (34.7 million tenge).
• In forests under the jurisdiction of FWC, there were 78 cases, involving

25,450 m³, causing damage estimated at $2.1 million (912.8 million tenge).

Measures to strengthen forest protection will be necessary, including more effective aerial monitoring, the use of satellite monitoring, and improving FWC territorial inspections, if the scale of illegal logging is to be reduced.

A new Criminal Code, from January 2015, introduced criminal liability for illegal logging, and the destruction of or damage to trees and shrubs.

In the fight against illegal logging, the FWC banned all logging in Kazakhstan's saxaul forests until 31 December, 2023 and until 2021, in the Yertis Ormany State Forest Natural Reserve.

Forests affected by pests and diseases

The total area affected by pests and forest diseases as of July 1, 2018, was 147,100 ha. In comparison to 2017, the area affected increased by 28,100 ha. The area under the influence of natural factors in 2019 decreased to 13,200 ha.

Reforestation and afforestation

Planting and natural regeneration are used in reforestation and establishing new forest. There are currently almost 900,000 hectares of new plantations, about 7% of the forested area. In total, there are 5.8 million ha of plantations in Kazakhstan.

The area of the forest fund includes: cutting of 118,600 ha; scorched forest and other lost plantations of 557,800 ha; glades 1,850,300 ha; low-forest lands – 3,257,900 ha.

The amounts of reforestation and afforestation have tended to decrease since 2015.

The area of reforestation and afforestation decreased over the last years, which threatens the ability of Kazakhstan to meet its international.

Since 2018, the regional akimats have developed projects to establish green areas around regional population centres. About 68,000 ha have been established to date, against a target of 230,000 ha.

In 2018, regional akimats approved plans to use local budgets to increase reforestation and afforestation. There are now 155 permanent forest tree nurseries, occupying 4,238 ha land and producing 162 million seedlings every year, of which about 80 million are high quality.

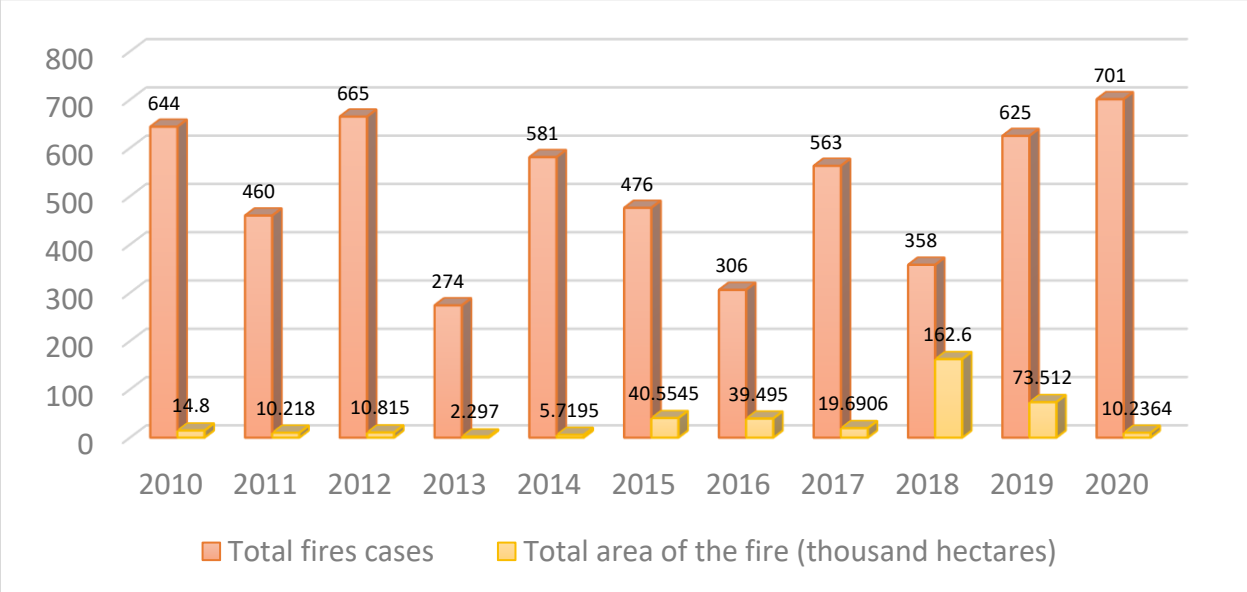

Figure 13. Cases and areas of fire

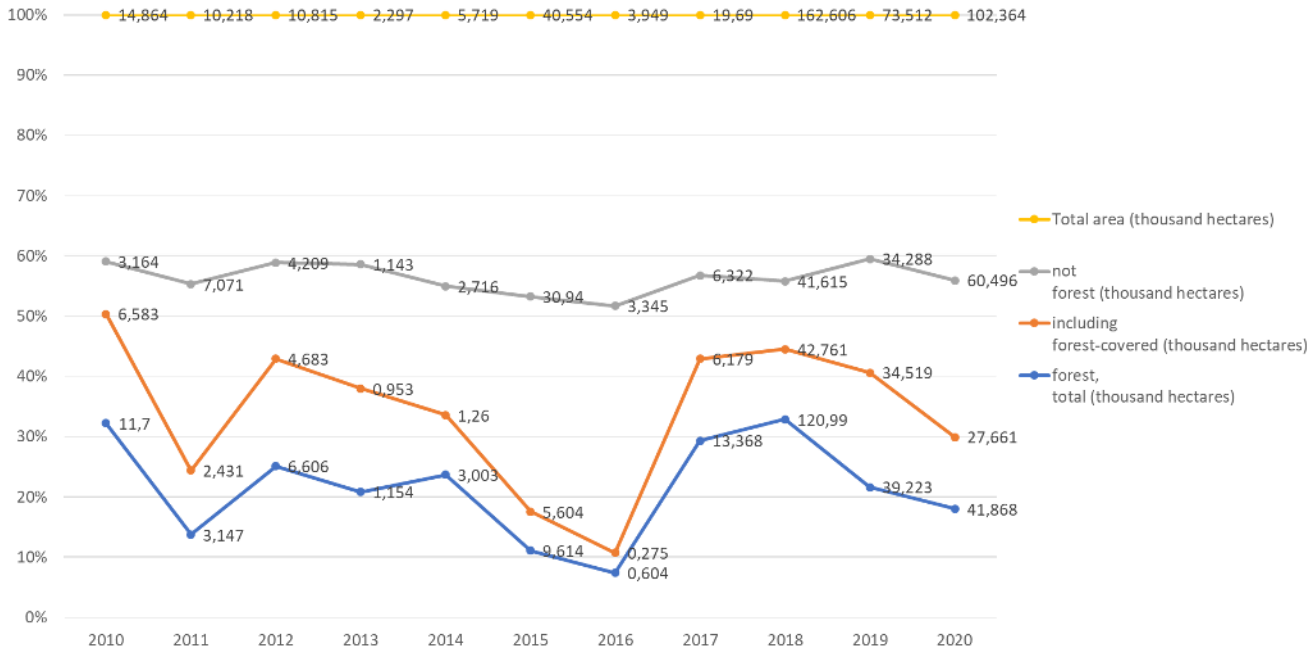

Figure 14. Areas covered by fire (ha)

Figure 15. Dynamics of the total area of the state forest fund from 2003 to 2018 (Thousands ha)

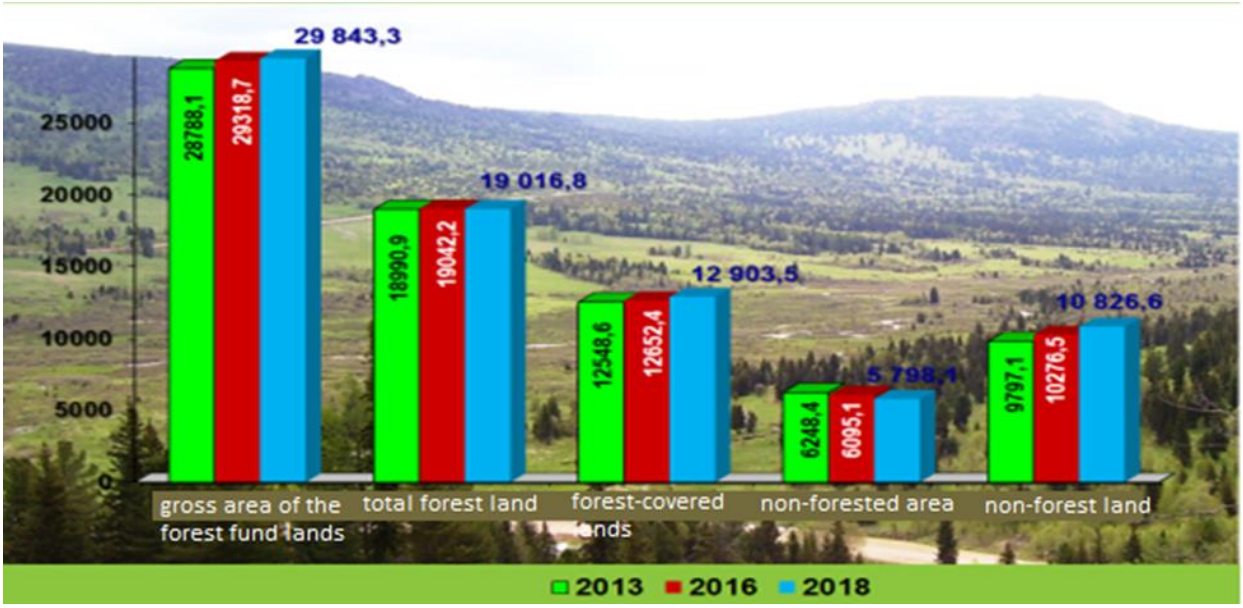

Figure 16. Dynamics of the state forest funds by land types from 2013 to 2018 (Unit: thousand ha)

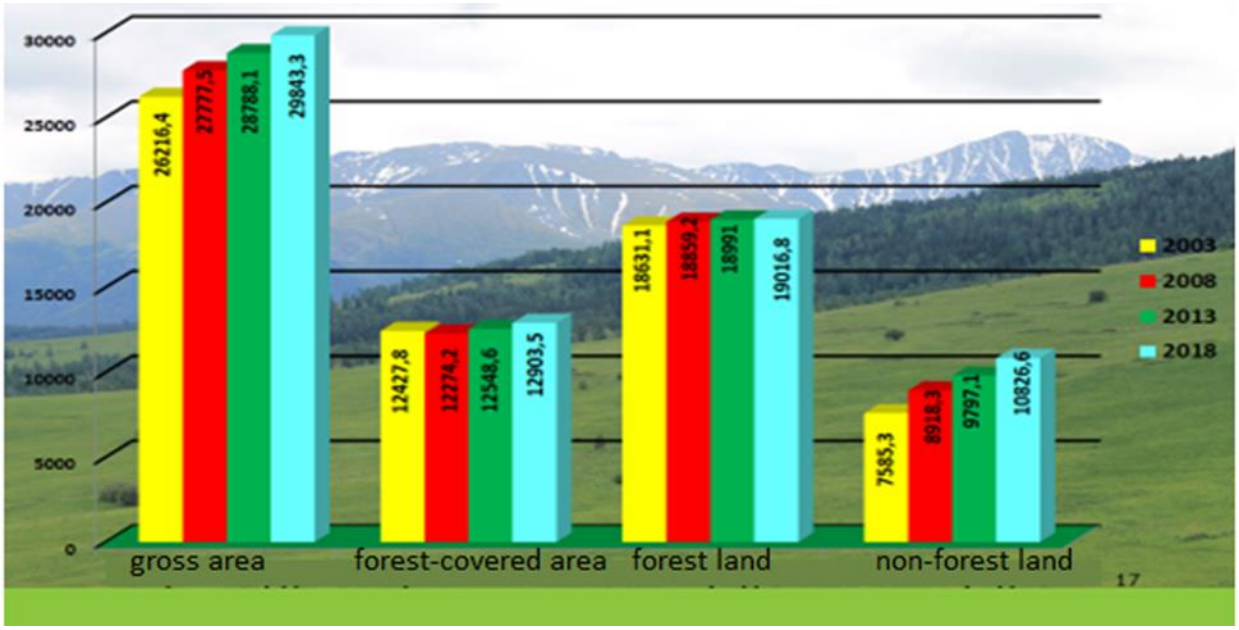

Figure 17. Dynamics of the forest-covered and non-forest lands of the state forest funds from 2003 to 2018

3.2. Forest Policy Direction and Strategies

3.2.1. Forest Legislations

Framework Convention on Climate Change and the Paris Agreement, as well as the Agenda for Sustainable Development, 2030. The Astana Resolution (2018) is a commitment to restore 1.5 million hectares of forest, by 2030.

Forest legislation is contained in the Forest, Land and Water Codes, and laws covering the Conservation, Reproduction and Use of Wildlife and Specially Protected Natural Areas. A 2012 amendment prohibits sawmills in the protection zones of state forest natural reserves.
An amendment to the Law on the Regulation of Trading Activities (2017), prohibits the sale of saxaul wood products. The law on Specially Protected Natural Areas (SPNA), introduces the concept of biosphere reserves and introduced coordination councils at environmental institutions, to secure the interests of biodiversity conservation and development of ecological tourism in protected areas. A 2017 amendment of the Forest Code allowed the transfer of green spaces from other categories to the forest fund.
FWC is empowered to respond promptly to illegal activity by individuals and legal entities. Measures include stopping transport, checking documents. detaining and seizing tools, including weapons, vehicles and watercraft.
Where forest land is disturbed by mining, for example, users must restore the land and plant twice the area with forest.
Environmental legislation, covering the import of wild animals, wild plants and raw materials of wild medicinal plants from the Eurasian Economic Union (EAEU), has been brought into line with EAEU decisions.
The Presidential decrees on transition to a green economy and the action plan for its implementation (2013) and the Strategic Plan of the Ministry of Ecology, Geology and Natural Resources (2019) also cover forestry.
Forest issues are included in the state programmes for development of tourism and agro-industrial complexes.
Kazakhstan adopted national C&I for SFM in 2019, using UNECE/FAO guidelines. The Republican Dispatch Service was created to coordinate actions to extinguish forest fires. Aerial observation of forests is carried out in Almaty, Akmola, East Kazakhstan, Zhambyl, Karaganda, Kostanay and Pavlodar regions on 8.9 million hectares (30% of the territory of the State Forest Fund), which complies with current regulations. The FWC plans to increase the area of aerial observation to forests in West Kazakhstan, Turkestan and Kyzylorda. Local executive bodies are responsible for putting out local steppe fires.
A pilot information system for combating forest fires (IS CCF), using optical-sensory systems with internet data transmission, was trialled in the Semey Ormany State Forest Natural Reserve. This operated from 2011 - 2019, during which time the average fire was 0.5 ha, compared with 17.3 ha over the period 2004 – 2010.

3.2.2. Institutional Settings for National Forest Management

According to Article 31 of the Forest Code of the Republic of Kazakhstan, the following types of forest management can be carried out on the plots of the state forest fund:
1) wood harvesting;
2) harvesting of oleoresin, wood juices;
3) use of plots of the state forest fund for the needs of hunting;
4) use of plots of the state forest fund for research purposes;
5) use of plots of the state forest fund for health, recreational, historical and cultural, tourist and sports purposes;

6) use of the plots of the state forest fund for the cultivation of planting material of tree and shrub species and plantation plantations for special purposes;
7) secondary forest management.

According to the Rules of secondary use of forest on the territory of the State Forest Fund approved by the Order of the Minister of Agriculture of the Republic of Kazakhstan dated April 30, 2015 No. 18-02/405 the following types of secondary forest uses are carried out in the state forest fund:
1) deer (maral) breeding, animal husbandry;
2) placement of beehives and apiaries;
3) gardening, melon growing, gardening and cultivation of other agricultural crops;
4) harvesting and collection of medicinal plants and technical raw materials, wild fruits, nuts, mushrooms, berries and other food products, moss, forest litter and fallen leaves, reeds;
5) haymaking and cattle grazing.
On 1 January, 2020, there were 1,542 individuals and legal entities with longterm use of forest resources on 1.4 million hectares, including:
1) Timber harvesting: 70 users, 1,412,500 ha;
2) Cultural and recreational purposes: 693 users, 31,800 ha;
3) Secondary use: 67 users, 397,900 ha;
4) Planting material production: 8 users, 100 hectares;
5) Hunting: 17 users, 200 hectares;
6) Research: 3 users, 2.3 hectares.

3.2.3. Forest Tenure and Governance

Forest management is carried out at the republic and local levels. The Forestry and Wildlife Committee of the Ministry of Ecology, Geology and Natural Resources (FWC) operates at the republic level. There are 42 staff at the FWC head office. Additionally, there are 14 regional offices with 267 staff. The FWC includes service organizations of forestry: Republic State Owned Enterprise (subsequently referred to as - RSOE) Kazlesproekt (500 staff); RSOE Kazakh base of aviation services for forestry (310 staff); RSOE Republic Forest Breeding and Seed-Breeding Centre (198 staff); Republic State Enterprise (subsequently referred to as – RSE) Zhasyl aimak (519 staff) and 29 environmental institutions with 3,509 staff. Currently, the environmental institutions have on average, only 70% of the material and technical equipment prescribed by national standards.

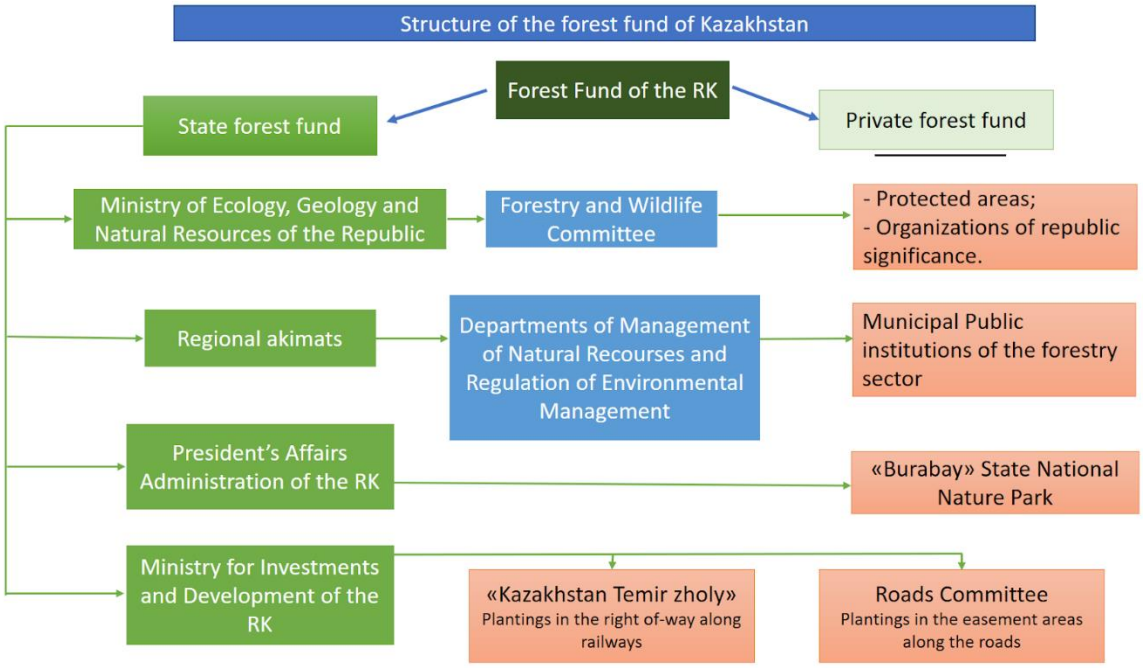

Figure 18. Structure of the forest fund of Kazakhstan

Forestry and Wildlife Committee *(Regulations on the Forestry and Wildlife Committee of the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan Order No. 4-P dated July 30, 2019.)*

1.The Republican State Institution "Committee of Forestry and Wildlife of the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan" (hereinafter – the Committee) is a state body and department within the competence of the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan (hereinafter - the Committee). – The Ministry), performing strategic, regulatory, implementation and control functions in the field of forestry, protection, reproduction and use of wildlife and specially protected natural territories, assigned to it by the Constitution, laws, other regulatory legal acts of the Republic of Kazakhstan and this Regulation.

2. The Committee carries out its activities in accordance with the Constitution and laws of the Republic of Kazakhstan, acts of the President and the Government of the Republic of Kazakhstan, other regulatory legal acts, as well as this Regulation.

3. The Committee is a legal entity in the organizational and legal form of a state institution, has seals and stamps with its name in the state language, forms of the established sample, in accordance with the legislation of the Republic of Kazakhstan accounts in the treasury bodies.

4. The Committee enters into civil law relations on its own behalf.

5. The Committee has the right to act as a party to civil law relations on behalf of the State, if it is authorized to do so in accordance with the legislation.

6. The Committee on issues of its competence, in accordance with the procedure established by law, makes decisions drawn up by orders of the Chairman of the Committee and other acts provided for by the legislation of the Republic of Kazakhstan.

7. The structure and the limit of the staffing of the Committee are approved in accordance with the current legislation of the Republic of Kazakhstan.
8. Location of the legal entity: Republic of Kazakhstan, 010000, Nur-Sultan city, Esil district, Mangilik El street, house 8, administrative building "House of Ministries".
9. The full name of the state body is the republican state institution "Committee of Forestry and Wildlife of the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan".
10. This Regulation is the constituent document of the Committee.
11. The Committee's activities are financed only from the republican budget.
12. The Committee is prohibited from entering into contractual relations with business entities for the performance of duties that are the powers of the Committee.

If the Committee is granted the right by legislative acts to carry out income-generating activities, then the income received from such activities is directed to the state budget income.

At a local level, the regional akimats are in charge of 120 state forestry locations, with 7,000 employees. These forestry institutions have on average, 65% of the material and technical equipment laid down in national standards. Forestry reforms in 2003, transferred responsibility for forest management of 80% of forest fund land to akimats, which have established units to carry out forest management.
Until 2003, the State forestry ("leskhoz") had the legal status of national State enterprises and performed economic functions and the functions of management and control. Since 2000, reforming the industry has been carried out, to distinguish commercial functions related to logging and wood processing, and management functions, and State control, as well as the decentralization of the management. As a result, in the last 10 years, a new system of forest management was formed. However, some of the concepts of the former Soviet Union were maintained, in particular;

1. the concept that all forest resources are owned by the State (i.e. its "Forest Fund")
2. a centralized management system.[51]

The functions of the authorized body of the Government of Kazakhstan for the management and implementation of State control and supervision of forests in the whole territory of the Republic are under the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan, administered through its regional inspectorates. 146 forest enterprises that existed earlier were deprived of logging and monitoring functions and then converted into 123 state forestry agencies. These institutions to decentralize the management are assigned to oblast authorities ("akimat"). They have a more rigorous regime for protecting land and natural systems, and the use of the forest is in these protected territories is extremely limited. Forest management (mostly logging) is performed by the transfer of forest resources in public ownership for long-term use by a non-State entity, based on the results of forest competitions (tenders). They are organized

[51] Andrey Kushlin, Tjaart Schillhorn Van Veen and William Sutton, *Kazakhstan-Forest Sector in Transition: The Resource, the Users and Sustainable Use* (Astana: The World Bank, 2010), 29.

by oblast authorities under the supervision of an authorized body of the Government of the Republic of Kazakhstan on forests. The winners of tenders (legal entities and individuals) sign a long-term forest management agreement, obliging them to work within the allocated forest area and subject to payment of a relevant annual fee to the State budget. The term of such a transfer of forest resources to management for timber is from 10 years, up to 49 years. Tenders are also held for the implementation of the following types of forest management:

1. collecting soft resin and tree saps – the transfer of forest resources to the user for a period of 10 to 15 years;
2. the use of sites of the forest fund for the needs of State hunting, a term from 10 to 49 years;
3. the use of plots of the State Forest fund for recreational, leisure, tourism, and sport purposes, also from 10 to 49 years.

The Government of Kazakhstan is taking measures to streamline management and supervisory functions in the forestry sector, eliminating overlapping functions in public administration.[52]

Figure 19. Map of administrative districts[53]

[52] Arcady Radionov, *The States of Forest Genetic Resources in the Sec Region, The Republic of Kazakhstan Country Report* (Ankara: The FAO, 2013), 9-10.

[53] "Administrative Map of Kazakhstan - Nations Online Project," *Nationsonline.org*, last modified n.d., accessed Apr 19, 2021, https://www.nationsonline.org/oneworld/map/kazakhstan-administrative-map.htm.

3.2.4. Government Budget Allocation for Forest and Forestry Sector

In accordance with Article 10915 of the Forest Code of the Republic, the costs of financing forestry through the State Forest Fund come from:

1) Budget funds.

2) Funds from paid services and the sale of goods of forestry institutions.

3) Funds of forest users.

4) Donations, voluntary contributions, including for forest ecosystem services,

of individuals and legal entities.

5) Other sources not prohibited by national legislation.

Funding is provided for:

1) Forest management, state accounting of the forest fund, state forest inventory,

state monitoring of forests.

2) Conserving forests from fires and protecting against pests and diseases.

3) Research and development work in the field of conservation, protection, use

of the forest fund, forest regeneration and afforestation.

4) Work on tree breeding and seed production, including the formation of a permanent forest seed extractory and store, certification of forest seeds.

5) Monitoring and controlling pests and forest diseases.

6) Training and professional development of forestry and hunting specialists.

7) Providing permits for forest use.

8) Activities in the areas of the State Forest Fund that are under the functional jurisdiction of the authorized body, local executive bodies of regions, cities of republic significance, the capital and other state bodies, by,

- Conserving forests from fires, unauthorized logging and other violations of the forest legislation of Kazakhstan, protecting forests from pests and forest diseases.
- Reforestation and afforestation.
- Construction and maintenance of forestry roads, fire-prevention arrangement of forests.
- Forestry design.
- Conducting thinning and sanitary felling, removal and accounting of cutting area.
- Capital investment in conservation, protection, reproduction of forests and afforestation.
- Cost of planting and growing plantations of fast-growing tree and shrub species, and developing private forest nurseries.

Forest institutions can retain funds from the sale of the following goods (works and services) that are not related to their main activity:

1) The cultivation of planting material for landscaping settlements and collecting forest seeds, the creation of greening, protective, plantation and other plantings, conducting training practice.

2) The sale of goods and products from the processing of wood from main-use logging, intermediate-use logging and other logging, including for providing the population with fuel, as well as products of secondary forest uses and the provision of wood processing services.

3) The provision of transport services to the population for the carriage of goods within the territory of forest institutions.

4) Carrying out forest regeneration on State Forest Fund land transferred to long-term forest management for timber harvesting, in accordance with the agreement concluded with the forest user.

The funds allocated from the national budget for conservation, protection, reforestation and afforestation fall short of needs (Table 7). Even with the addition of funding from local budgets and transfers from the national budget, there is still a shortfall (Table 8).

Table 7. Funds allocated budget for conservation, protection, reforestation, and afforestation from 2016 to 2018

Name of programmes (Management, ensuring the conservation/development of forest resources and wildlife)	2016 ($ milllion)	2017 ($ milllion)	2018 ($ milllion)
Conserving areas within the nature reserve fund	19	19	19
Conservation, regeneration and rational use of forest resources	12	17	17
Totals	31	36	36

Source: Forestry and Wildlife Committee of the Ministry of ecology, geology and natural resources of the Republic of Kazakhstan

Table 8. Funds allocated from local and republic budges by region

№	Region	***2016***			***2017***			***2018***		
		Total ($)	Local budget ($)	Republic budget ($)	Total ($)	Local budget ($)	Republic budget ($)	Total ($)	Local budget ($)	Republic budget ($)
1	**Akmola**	1,915,000	1,293,000	622,000	1,958,000	1,958,000		2,420,000	2,013,000	407,000
2	**Aktobe**	867,000	685,000	182,000	911,000	911,000		961,000	961,000	
3	**Almaty**	2,301,000	1,908,000	393,000	2,639,000	2,639,000		2,932,000	2,932,000	
4	**Atyrau**	295,000	249,000	46,000	282,000	282,000		374,000	374,000	

5	**East Kazakhstan**	3,068,000	2,444,000	625,000	3,339,000	3,339,000		3,647,000	3,647,000	
6	**Zhambyl**	2,026,000	1,725,000	302,000	2,317,000	2,317,000		2,092,000	2,092,000	
7	**West Kazakhstan**	1,132,000	920,000	212,000	1,179,000	1,179,000		1,197,000	1,197,000	
8	**Karaganda**	777,000	620,000	157,000	807,000	807,000		814,000	814,000	
9	**Kyzylorda**	1,593,000	1,159,000	434,000	1,714,000	1,714,000		1,846,000	1,846,000	
10	**Kostanai**	1,793,000	1,458,000	334,000	2,127,000	2,127,000		2,341,000	2,341,000	
11	**Mangystau**	240,000	194,000	47,000	237,000	237,000		212,000	212,000	
12	**Pavlodar**	654,000	537,000	118,000	663,000	663,000		693,000	693,000	
13	**South Kazakhstan**	1,665,000	1,331,000	334,000	1,696,000	1,696,000		1,735,000	1,735,000	
14	**Turkestan**	1,893,000	1,662,000	231,000	2,567,000	2,567,000		2,220,000	2,220,000	
	Totals	20,219,000	16,184,000	4,035,000	22,436,000	22,436,000		23,485,000	23,078,000	407,000

3.2.5. Key National Forest Policies and Programs

Past Forest Protection and Regeneration Policies

Due to the lack of wood, the forests of Kazakhstan do not yet play a decisive role in its economy. Protection and regeneration of forest resources are important objectives for forestry. Regeneration is focused on using natural and artificial methods of reforestation and afforestation. For silviculture activities on the lands of the forest fund, there permanent forest nurseries with areas of 4,364 hectares were created, where 150-200 million pieces of standard seedlings of various species can be grown annually. The selection is based on forest seed base; it is presented by superiorly phenotypic plus trees, plus plantings, permanent and temporary sites of seed-planting sites and seed-planting plantations.

In the Forestry and Hunting Committee of the Ministry of Agriculture of Kazakhstan, Almaty and Kokshetau forest breeding centers were formed, with the purpose permanently to create basic forest-forming species plant introductions and ensuring forestry seeds and planting materials of high genetic value, productivity, and sustainability. In the first years of independence Kazakhstan (1992), through a transition period of economic development, work on reproduction in forests and afforestation were practically suspended due to the lack of funds in the State budget. Since 2005, the work resumed due to the adoption of the Government of the Republic of Kazakhstan of two mid-term programmes “Zhasyl ate” (“green country”), effective until 2010, and sectoral programs “Zhasyl damy” (“green development”) for the 2010-2014 period. Under this program, the reproduction of forests and afforestation in the lands of the forest fund was planned in the following volumes: 52.8 thousand ha in 2011, 59.9 thousand ha in 2012, 60.8 thousand ha in 2013, and 60.6 thousand hectares in 2014.

Sustainable Forest Management for Cities: The "green belt" of Astana city (Nur-Sultan)

The creation of a "green belt" around the city of Astana, the capital of the Republic of Kazakhstan, has been underway since 1997. Among the main aims behind the project is the improvement of the environmental situation in the city, specifically reducing wind load and improving air quality and the level of dust pollution in urban areas. In addition, the introduction of a "green belt" around Astana serves to create recreational spaces for residents and guests of the capital, as well as improve the livelihoods of the local population through new job creation. The project is financed by the Government of Kazakhstan and implemented by state enterprise "Zhasyl Aimak". The creation and gradual expansion of Astana's "green belt" have taken place over several stages described in greater detail below.

During the development and implementation of the project, various methods and strategies for the creation of green spaces were considered and evaluated, studying the international experience and best practices in afforestation and sustainable forest management (including that of the Russian Federation, the People's Republic of China, Canada and Mongolia). This approach resulted in the selection of the most effective, appropriate, and sustainable methods of "greening" the city of Astana.

The first stage in the creation of Astana city's "green belt" involves conducting scientific research and the identification of suitable tree planting technologies, along with the development of recommendations on the tree and shrub species to be selected. Over the next 2-3 years, several measures are taken to prepare the soil, including plowing, harrowing and cultivation, and snow retention. The material to be planted is grown in specialist tree nurseries.

In the five years after the establishment of tree plantations, forest cultures are carefully cared for using techniques such as manual weeding in rows, mechanized cultivation in row-spacing, watering of the plantations in the first year of creation, and artificial shading of trees and shrubs. Lastly, various measures are taken to prevent forest fires and illegal logging, as well as to combat the spread of harmful diseases and pests. This stage also involves the reintroduction of fauna, specifical resettlement of wild ungulates and the breeding and release of pheasants into Astana's "green belt".

In the last ten years, an area of 78,000 hectares around the city of Astana has been forested. The "green belt" of Astana is expected to reach 100,000 hectares by 2020. Although the full impact of the "green belt" will not be felt until the forests reach full size and maturity, numerous benefits can already be observed. It is reported that thanks to the introduction of the "green belt", temperatures in Astana have increased by 0.3C since 1997, while average wind speeds have fallen. According to the Kazgidromet national meteorological center, there has been a threefold drop in the number of snowstorms and fog in the capital. In addition, the forest of the "green belt" has

been described as a natural oasis inhabited by wild animals and birds, such as foxes, hares, and pheasants. Construction of a recreational zone in the "green belt" forest is currently underway.

The challenges encountered during the creation of Astana's "green belt" included a high level of soil salinity, the close proximity of groundwater to the surface, a severe and sharply continental climate (temperatures ranging from -40C in winter to +40C in the summer), low precipitation (150-250 mm/year) and strong winds. Initially, extreme weather conditions had meant that few trees were able to survive, leading the authorities to plant trees in test conditions to determine in advance whether they would be able to tolerate Astana's harsh climate. Over the years, the invaluable experience was gained in the design of forest plantations, soil cultivation, application of soil desalinization technologies, creation of strip plantations, and successful selection of tree and shrub species, taking into account the natural, climatic, and soil conditions of the region.54

Landscape Restoration Project for 2021-2025

Forestry and Wildlife Committee of the Ministry of Ecology, Geology, and Natural Resources of Kazakhstan announces the planned implementation of the Landscape Restoration Project for 2021-2025. The project funded by the Global Environment Facility (GEF) allocated through the World Bank. The project aims to create demonstration plots on the application of advanced agroforestry practices, create saxaul plantations around the city of Kyzylorda, construct a nursery in Zhambyl region, map the dried bottom of the Aral Sea, accomplish inventory of unaccounted forests and other activities.

The project activities were identified based on analysis of barriers to conducting landscape restoration, which includes weak institutional and technical capacity to utilize advanced technologies for the implementation of sustainable landscape practices and maintain restoration because of rapid climate change, insufficient knowledge about advanced practices implemented in neighbor countries in the region. The project will also address the lack of clarity on incentives and technical knowledge available for farmer and community-centered landscape management models, and Insufficient budgetary support to test innovative methods in sustainable landscape management. 55

3.2.6. Forest Sector's Alignment to National Imperatives

[54] Forestry and Wildlife Committee of the Ministry of Agriculture of the Republic of Kazakhstan, *Sustainable forest management for cities: The "green belt" of Astana city-The Republic of Kazakhstan* (n.p.: The Forestry and Wildlife Committee of the Ministry of Agriculture of the Republic of Kazakhstan, n.d.), 1-2.

[55] The Republic of Kazakhstan, *Landscape Restoration Project ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)* (n.p.: The Republic of Kazakhstan, 2020), 3-5.

Forestry is one of the branches of the modern diversified economy of Kazakhstan and is guided by the current strategic documents of the country's development. The most important strategic documents adopted in recent years:

1) Strategy “Kazakhstan-2050”: a new political course of the established state (proclaimed by the President of the Republic of Kazakhstan - the Leader of the nation Mr. N. Nazarbayev on December 15, 2012, in a message to the people of Kazakhstan);

2) Concept of Kazakhstan joining the top of 30 most developed economies of the world, approved by Presidential Decree of January 13, 2014, № 732;

3) Concept of transition of the Republic of Kazakhstan to “green economy”, approved by Presidential Decree of May 30, 2013, № 577;

4) The concept of innovative development of the Republic of Kazakhstan until 2020 approved by Presidential Decree of June 04, 2013, № 579;

5) Strategic Development Plan of the Republic of Kazakhstan until 2020, approved by Presidential Decree of February 01, 2010, № 922;

6) Forecast scheme of territorial and spatial development of the Republic of Kazakhstan until 2020, approved by Presidential Decree of July 21, 2011, № 118;

7) State Program of development of the agro-industrial complex of the Republic of Kazakhstan for 2017–2021, approved by the Government of the Republic of Kazakhstan № 423 of July 12, 2018, determine the most important strategic directions of the country's development and the of sectors of economy.

The Presidential decree on the Concept for the transition of the Republic of Kazakhstan to a green economy16 (May 30, 2013) and the Action Plan for its implementation, the Strategic Plan of the Ministry of Ecology, Geology and Natural Resources17 (Sep 09, 2019) are among primary documents relating to forestry. Forest issues are included in the State Programme for the Development of the Tourism Sector in Kazakhstan18 and the State Programme for the Development of the Agro-Industrial Complex of Kazakhstan for 2017-202119.

In different years, the Government of the Republic of Kazakhstan approved a number of sectoral medium-term programs that defined individual targets and activities for each 3-5 year development period. At the same time the following programs previously acted in the field of forestry:

1. Sectoral Program “Forests of Kazakhstan” for 2004-2006.

2. The branch program “Zhasyl Yel for 2005-2007”.

3. Sectoral Program ""Zhasyl Yel for 2008-2010”.

4. Sectoral Program “Zhasyl Damu for 2010-2014”, which defined individual targets for the medium term.

In particular, the following was implemented:

- The management of forestry institutions was transferred to the regional akimats;
- The principle of differentiation of functions of forest use regulation and functions of implementation of felling of main use and processing of received wood was implemented;
- The functions of state control and supervision of forests were streamlined; the concept and practice of creating a private forest fund were introduced;
- Rules for the reimbursement of expenses for the establishment and cultivation of fast-growing tree and shrub species plantations, for the creation and development of private forest nurseries were approved as measures to support private forest owners and forest users;
- A cadastral survey of forest resources was formed;
- In order to preserve coniferous and saxaul forests, a 10-year moratorium on their cutting was introduced, which allowed to stabilize protection and condition of these plantations in general (the moratorium on saxaul forests was extended for another 5 years);
- The age of trees suitable for logging was revised and augmented;
- For the first time, a procedure was introduced for organizing and holding tenders for the provision of forest resources on plots of the state forest fund for long-term forest use;
- A list and rules for the control of especially dangerous pests and forest diseases, with the exception of quarantine species, were developed and approved;
- The network of forest nurseries was mainly restored, and sustainable growth of forest regeneration was ensured, the number of breeding, seed production and selection and genetic objects was increased; forestry seed zoning was adopted;
- Control measures were enhanced, and forest fire areas have significantly decreased.

In the sphere of regulation of forest relations, relevant changes were made to the existing Forest Code and related codes and laws of the Republic of Kazakhstan, as well as to a set of by-laws. The latest changes to the Forest Code occurred in 2017.

Currently, according to the instruction of the President of the Republic of Kazakhstan, 2 billion trees are being planted on the territory of the state forest fund until 2025. At the same time, in order to mitigate the consequences of the ecological disaster in the Aral region, forest reclamation of the dried-up bottom of the Aral Sea is being carried out.

Kazakhstan-2050

The Republic of Kazakhstan, by adopting the Strategy "Kazakhstan-2050" and the Concept of transition to a "green economy", has set clear guidelines for the construction of a sustainable and effective model of the economy based on the principles of a "green" development path. According to the Concept, by 2050, the transformations in the framework of the "green economy" will further increase GDP by 3%, create over 500 thousand new jobs, create new industries and services, to ensure the highest standards of quality of life the population. The transition to sustainable development and the integration of the principles of a "green" economy is promoted by the adopted UN SDGs (2015), the Paris Climate Agreement (2015), and the Long-term Development Strategy of Kazakhstan until 2050 (2012), Action Plan for the implementation of the Concept for the transition to a "green" economy for 2013-2020 (2013), Strategic Development Plan of the Republic of Kazakhstan until 2025 (2018). The effectiveness of the course for sustainable development and the implementation of the adopted country documents requires constant monitoring of the current status and improvement of the system of target indicators. 56

Road Maps for the Comprehensive Solution of Environmental Problems in the Regions

In 2020, Kazakhstan plans to adopt a new Environmental Code, which establishes the principle "the polluter pays - fixes". This will allow, within the framework of the new regulatory system, to introduce new environmentally friendly technologies into production.

Following the discussion of environmental problems with the public in all regions of the country, regional roadmaps were approved to improve the environment. Their implementation, the introduction of advanced technologies, and the implementation of the norms of the new environmental code will allow by 2024 to reduce the air pollution index and generally improve the environmental situation in the country.

Until 2025, it is planned to increase the area of forests in the Republic of Kazakhstan by 500 thousand hectares, planting more than 2 billion trees. Six pilot projects of waste processing plants will be launched in the cities of Nur-Sultan, Almaty, Shymkent, Atyrau, Aktobe, and Taraz, which will attract at least 200 billion tenge of private investment and achieve the share of solid waste processing up to 30%. "Improvement of the environment in the country is one of the priority tasks set by the Head of State Kassym-Jomart Kemelevich Tokayev," Prime Minister (Askar Mamin) said. The Head of Government instructed the Ministry of Ecology, jointly by akimats, to ensure

[56] The Ministry of National Economy of the Republic of Kazakhstan, *National Report based on the OECD Green Growth Indicators* (Nur-Sultan: The Statistics Committee of the Ministry of National Economy of the Republic of Kazakhstan, 2019), 13.

the full and timely implementation of the roadmaps for the comprehensive solution of environmental problems in the regions with regular meetings with the public.57

Pilot-based Afforestation and Reforestation of Degraded Forest Areas in the Border Area between Kazakhstan and Kyrgyzstan

The official launch of the regional project "Pilot-based Afforestation and Reforestation of Degraded Forest Areas in the Border Area between Kazakhstan and Kyrgyzstan" took place online on 20 November 2020. The project was initiated by Department for Forest Ecosystems Development (DFED) under the State Agency for Environmental Protection and Forestry under the Government of the Kyrgyz Republic and the Committee for Forestry and Wildlife (CFW) in the Ministry of Ecology, Geology and Natural Resources of the Republic of Kazakhstan. The project is being implemented with the support of the German Society for International Cooperation (GIZ) GmbH (Deutsche Gesellschaft für Internationale Zusammmenarbeit) on behalf of the German Ministry for Economic Cooperation and Development (BMZ).

The project aims to develop an economically viable concept of afforestation, forest landscape restoration, adapted to the local conditions of the two countries. At the initial stage of the project, analysis based on historical mapping of forest cover change satellite images will be documented over a time series of 40 to 70 years. It would support to determine the areas in the border regions of Kyrgyzstan and Kazakhstan where the forest cover changed: degradation and/or loss of forests.

Further, under the leadership of DFED and CFW, representative pilot sites will be selected for afforestation and reforestation, considering local conditions and national policies of both countries, as well as involving a wide range of local stakeholders in the process. At the final stage of the project, all processes will be described, and the gained experience will be documented. It is expected that the methodology developed and tested during the project for identifying potential areas for reforestation, will enable Kyrgyzstan and Kazakhstan to scale up the pilot experience and help the governments of the two countries fulfill their obligations under the international Bonn Challenge initiative.58

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[57] "Askar Mamin: Improving the country's environmental state is priority task of Government," *Primeminister.kz*, last modified n.d., accessed Apr 19, 2021, https://www.primeminister.kz/en/news/a-mamin-eldegi-ekologiyalyk-ahualdy-zhaksartu-ukimettin-basym-mindeti-2410226.

[58] "Pilot-based Afforestation and Reforestation of Degraded Forest Areas in the Border Area between Kazakhstan and Kyrgyzstan," *Gov.kz*, last modified Dec 18, 2020, accessed Apr 19, 2021, https://www.gov.kz/memleket/entities/forest/press/news/details/137086?lang=en.

3.2.7. International Engagement & commitment to International/Regional Goals

Kazakhstan has ratified the Convention on the Conservation of Biodiversity and its protocols (Cartagena, Kyoto and Nagoya), the Framework Convention on Climate Change and the Paris Agreement, and the Agenda for Sustainable Development, 2030.

The Astana Resolution (Astana, June 22, 2018) specifies Kazakhstan's obligation to restore 1.5 million hectares of forest, as a part of the Bonn challenge, by 2030.

Legislation on forest issues is contained in the Forest, Land and Water Codes, and laws covering the Conservation, Reproduction and Use of Wildlife and Specially Protected Natural Areas. A 2012 amendment prohibits sawmills in the protection zones of state forest natural reserves. An amendment to the Law on the Regulation of Trading Activities, in 2017, prohibits the sale of saxaul wood products. The concept of biosphere reserves was introduced into the law On Specially Protected Natural Areas, and the requirement was added to form coordination councils at environmental institutions to ensure that the 13 interests of biodiversity conservation and the development of ecotourism in protected areas are respected. Also, in 2017, the Forest Code was amended to allow the transfer of green spaces to the forest fund, from other classes of land.

The supervisory functions of FWC inspectors have been expanded, allowing them to respond promptly to illegal activity by individuals and legal entities by stopping transport, checking documents, detaining and seizing harvesting equipment, including weapons, vehicles and watercraft.

There are three categories that allow the legal transfer of land in specially protected natural areas to 'reserve' lands, i.e. those required for defense, for engineering structures, such as border posts at the state frontier, and for constructing strategic water facilities.

When state forest land has been used for uranium mining, for example, or any activity that disturbs subsoil, users are legally bound to restore the land and to plant the area twice, with forest and to undertake maintenance until these areas are established and can be transferred back. These same provisions apply to forest fund land that may be used for mining, but the maintenance obligation applies for only three years.

Environmental legislation covering the import of live wild animals, individual wild plants and raw materials of wild medicinal plants from the customs territory of the Eurasian Economic Union (EAEU) has been brought into line with EAEU decisions.

Rio-Conventions (UNFCCC, CBD, UNCCD)

UNFCCC

During 2004–2007 further climate change studies were conducted within the research programme of MEP. The research theme was "Estimation of regional climate change, climate change vulnerability and adaptation of ecosystems and climate-dependent branches of the economy, as well as climate change scenarios development under GHG concentration increase in the

atmosphere." Additional studies on climate change were conducted within the UNDP/GEF Project on the preparation of the Second National Communication (SNC) of the Republic of Kazakhstan to UNFCCC.[59]

CBD

The following measures are focused on the achievement of the national target in conservation, rational use, and reproduction of forest resources, which is equivalent to the Aichi Target 5:

1. Expansion of areas covered by forests. The scope of work for forest reproduction and afforestation was enhanced in 2013-2014 due to the expansion of forest cultivation activities at "Yertys Ormany" SNR (106% of the plan), "Semey Ormany" SNR (103%), and in Kyzylorda oblast (151%), including on the innings of the Aral Sea (162%) at the expense of the World Bank loan under the Forest Protection and Reforestation Project, green plantations along the AstanaShchuchinsk highway in Akmola oblast (115%), and saxaul forests in South Kazakhstan oblast.

   "Zhassyl Damu" programme envisaged government support to private afforestation by individuals and non-government legal entities cultivating fast-growing tree and shrub species for industrial and energy purposes, establishing and developing forest nurseries. The plan was to reimburse expenses on the establishment and cultivation of fast-growing tree and shrub species for industrial and energy purposes (up to 50%) and to set-up and develop private forest nurseries (up to 50%). However, due to a lack of adequate budgetary funding, the above was not fulfilled. With insufficient government support and investment, private afforestation in Kazakhstan is developing at a slow pace – as, of January 1, 2018, the area occupied by private forest fund amounted to 695 hectares.
2. Forest protection from fires, illegal logging, and pests. This task required the implementation of a set of forest fire prevention measures, including the arrangement of fire breaks and lines and their maintenance, the repair of forestry and fire safety roads, and active efforts to protect forests from pests and diseases with the use of biological methods, in the first place. The section of the "Zhassyl Damu" programme dedicated to conservation and rehabilitation of natural ecosystems set a target to reduce the average forest fire area to 10.8 ha in 2013 and 2014. In fact, according to the reports of the Committee for Forestry and Wildlife, the area of one fire was 3.5 ha in 2013 and 5.4 ha of forest area in 2014. In 2017, it was supposed to be 10.5 ha, whereas the actual area was 11.0 ha. So, the target had not been achieved by the end of the reporting period.
3. Forest management. An important activity for forest protection and forested area expansion is forest management fieldwork. These are stipulated in the Strategic Plan of the Ministry of Agriculture for 2010-2014. Kazakhstan has implemented 8 international treaties and agreements for forestry made at the government and ministry level:
   A. The timber industry and forestry cooperation agreement (September 11, 1998, Moscow);

[59] Irina Yesserkepova, *Kazakhstan* (n.p.: FAO, n.d.), 68.

B. The "Altai" cross-border reservation establishment agreement between the Governments of the Republic of Kazakhstan and the Russian Federation (September 15, 2011, Astrakhan);
C. The Volga-Ural Saiga Group (Saiga tatarika tatarika) Protection, Reproduction and Utilization Agreement between the Ministry of Agriculture of the Republic of Kazakhstan and the Ministry of Natural Resources and Environment of the Russian Federation (September 19, 2012, Pavlodar);
D. The forestry cooperation agreement between the Ministry of Agriculture of the Republic of Kazakhstan and the Ministry of Forestry of the Republic of Belarus (November 9, 2012, Astana);
E. Agreement on natural fires prevention and suppression in the border areas of the CIS member states (May 31, 2013, Minsk);
F. Agreement on forest and steppe fires prevention and suppression in the border areas between the Government of the Republic of Kazakhstan and the Government of the Russian Federation (June 2, 2013, Yekaterinburg);
G. Agreement on the conservation and rational use of aquatic bioresources of the Caspian Sea (September 29, 2014, Astrakhan);
H. Memorandum of Understanding on cooperation in the field of forestry and forest regeneration in the Republic of Kazakhstan between the Ministry of Environment and Water Resources of the Republic of Kazakhstan and the Korea Forest Service (June 20, 2014).[60]

UNCCD

According to the definition of the UN Convention to Combat Desertification (UNCCD), desertification is the "degradation of lands in droughty, semiarid and dry sub-humid areas resulting from various factors, including climate change and man-caused factors". The causes for desertification in Kazakhstan are both natural and anthropogenic. The main natural factor contributing to the desertification processes in Kazakhstan is the intra-continental location of the country, which determines the climate continentality and dryness, deficiency and distribution misbalance of water resources, leading to the vast expansion of sands (up to 30 million hectares) and soil salinization (127 million hectares). Conditions conducive to land degradation processes are also created by the abnormalities of seasonal land formation particularities resulting from droughts. Another drought-causing factor is a scarce vegetative cover and its growth dynamics. Such natural specifics of Kazakhstan cause poor environmental resistance to the man-made influence (according to the available assessments, about 75 % of the territory is exposed to the increased risk of ecological destabilization). Man-caused factors, leading to the occurrence and

[60] The Clearing-House Mechanism of the Convention on Biological Diversity, *6th National Report for the Convention on Biological Diversity* (n.p.: The Clearing-House Mechanism of the Convention on Biological Diversity, n.d.), 12-14.

development of desertification processes in Kazakhstan are connected mainly to such types of economic activity as:

1. Pasturing;
2. Farming;
3. Mining;
4. Construction and exploiting industrial, military, and civil units, irrigation, and linear establishments.

Desertification also results from illegal throwing, shrubbery, and subshrub uprooting for cattle fodder and fuel, fires in forests and steppes, chaotic recreation, dumps around settlements, pollution of soil and groundwater with toxic substances, and transportation implications. The main types of desertification in Kazakhstan, determined according to the criteria adopted by the UNCCD are:

1. Vegetation degradation;
2. Water and wind erosion;
3. Salinization and non-ulmification;
4. Chemical pollution of soil, subsoil, and surface waters;
5. Man-caused interference with the hydrological and soil regimes.

To prevent desertification in Kazakhstan, the UNCCD and the Ministry of Environmental Protection of Kazakhstan worked on a Combating Desertification Project to prevent desertification. For more information on this project, see the **Combating Desertification (2005-2015)** in [3.4.4.] [61]

UNFF

National radio amateur diploma program " Kazakhstan Flora Fauna"

Created to organize and conduct radio expeditions to specially protected natural areas to attract the attention of the world community to the problems of such territories, provide them with real and practical assistance, awaken in the minds of the inhabitants of Planet Earth a sense of pride in the natural and cultural heritage.[62]

The diploma has 3 classes:

1. To obtain the 3rd class diploma, radio amateurs-hunters need to conduct two-way radio communications with 5 reserves or national parks of the Republic of Kazakhstan.

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[61] Government of Republic of Kazakhstan, *The Program on Combating Desertification in the Republic of Kazakhstan 2005-2015* (Astana: The Government of Republic of Kazakhstan, 2005), 6.

[62] "UNFF-Kazakhstan Flora Fauna," *Unff.kz*, last modified n.d., accessed Apr 19, 2021, https://unff.kz/page.php?page_id=5&lang=1.

2. To obtain the 2nd diploma, radio amateurs-hunters need to conduct two-way radio communications with 10 reserves or national parks of the Republic of Kazakhstan
3. To obtain the 1st class diploma, radio amateurs-hunters need to conduct two-way radio communications with 15 reserves or national parks of the Republic of Kazakhstan.[63]

Supports international cooperation programs (FAO, AFoCO, etc.)

FAO

FAO, UNECE support Kazakhstan in developing a master plan for the forest sector

Forests are high on the political agenda of Kazakhstan. In collaboration with the joint UNECE/FAO Forestry and Timber Section and international experts, the country has developed the draft "Master Plan for the Development of the Forestry Sector of the Republic of Kazakhstan until 2030," as well as an action plan for its implementation.

The strategic documents were on the agenda on 4 March at a joint event of the Committee on Forestry and Wildlife under the Ministry of Ecology, Geology and Natural Resources of Kazakhstan and the UNECE/FAO Forestry and Timber Section in Nur-Sultan. The national forest policy dialogue was organized to continue work on the master plan and to carry out a participatory review of its content by involving external stakeholders in the decision-making process. Participants reviewed and commented on the document, while also aligning the master plan with commitments made as part of the Bonn Challenge.

The project aims to increase the state forest cover by up to 5 percent by 2030; improve the conservation and sustainable use of forest ecosystem biodiversity; improve the efficiency of forest protection services from fires and violations of forest legislation, protecting them from pests and diseases; and strengthen human resources of the forest sector in the economy.64

AFoCO

Kazakhstan joined on 4 October 2019 as a Party member of AFoCO.

On 3 September 2020, AFoCO and A.N. Bukeikhan Kazakh Research Institute of Forestry and Agroforestry (A.N. Bukeikhan KazRIFA) signed a Memorandum of Understanding (MoU) to implement the project titled "Investigation of the resistance of black saxaul (Haloxylon aphyllum) forms to gall-forming insects". The research project is funded by the National Institute of Forest Science (NIFoS) of the Republic of Korea, as a part of the AFoCO-NIFoS collaboration.

Beginning in October 2020, the two-year project will study the resistance of specified black saxaul plants among species damaged by gall-forming insects. To achieve these objectives, research will be conducted together with NIFoS to identify resistant plants and study their anatomical and

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[63] "UNFF-Kazakhstan Flora Fauna," *Unff.kz*, last modified n.d., accessed Apr 19, 2021, https://unff.kz/page.php?page_id=22&lang=1.

[64] "FAO, UNECE support Kazakhstan in developing a master plan for the forest sector," *Fao.org*, last modified n.d., accessed Apr 19, 2021, http://www.fao.org/europe/news/detail-news/fr/c/1265006/.

morphological features, biochemical properties, and genetic structures. There are also plans to conduct seminars with the staff of regional forest institutions and work on a research article to be published in foreign and domestic scientific journals.

Isolating economically valuable forms of saxaul that are not damaged by pests will be an initial stage for the establishment of sustainable plantations. The widespread planting of resistant saxauls will increase the productivity of plantations in the Aral Sea region. Valuable scientific observations from this project will also contribute to the reforestation of fields and pastures, the creation of green umbrellas, and the protection of settlements from drifting sand.65

24 September – 1 October 2019, Officials from Kazahkstan's Forestry and Wildlife Committee visited Korea to participate in a customized training course, "Lessons Learned from the National Reforestation Experiences of the Republic of Korea". The case of the ROK demonstrates that successful forest transition can be carried out in a relatively short period of time by a central authority, even with flaws in the governance structure and low levels of economic development. The training course, held between 24 September and 1 October, intended to share best practices and draw upon Korea's expertise in nationwide reforestation to help guide ongoing and future initiatives in Kazakhstan and contribute to the capacity development of Kazakh government officials in the area of reforestation and forest rehabilitation. Aside from lectures on Korea's national reforestation efforts, the customized course also incorporated field trips to relevant institutions such as the Baekdudaegan National Arboretum, Korea National Arboretum, National Institute of Forest Science (NIFoS), and the Saemaul Undong Memorial Hall.66

IUCN

Under the Bonn Challenge, Kazakhstan committed to restoring 1.5 million ha of forests by 2030 and thereby increasing the forest cover in Kazakhstan from 4.7 to 5% and reducing land degradation. Kazakhstan is in the process of setting Land Degradation Neutrality (LDN) targets. Under the Paris Agreement, Kazakhstan pledged to pursue greenhouse gas emissions mitigation policies that cover several sectors (energy, agriculture, waste, transport, buildings), including land use and forestry. In its INDC, the country committed to reducing emissions by 15% from the 1990 level. Kazakhstan's Climate Action Plan's goals are to integrate desertification combating measures into economic and social development, combat and prevent lands from desertification and maintain their enabling and sustainable condition. [67]

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[65] "First Kazakhstan project with A.N. Bukeikhan Kazakh Research Institute of Forestry and Agroforestry," *AFoCO*, last modified 08 Sep, 2020, accessed Apr 19, 2021, http://afocosec.org/afoco-embarks-on-first-kazakhstan-project-with-a-n-bukeikhan-kazakh-research-institute-of-forestry-and-agroforestry/.

[66] "TRAINING: Kazakhstan Officials Learn About Reforestation in Korea," *AFoCO*, last modified 02 Oct, 2019, accessed Apr 19, 2021, http://afocosec.org/training-kazakhstan-officials-learn-about-reforestation-in-korea/.

[67] The Republic of Kazakhstan, *Landscape Restoration Project ENVIRONMENTAL AND SOCIAL MANAGEMENT FRAMEWORK (ESMF)* (n.p.: The Republic of Kazakhstan, 2020), 3.

Other Projects with the United Nations

UN development system support

Ecosystems and natural resources are protected and sustainably used, and human settlements are resilient to natural and manmade disasters and climate change.

As part of the new UN project on the conservation of forest ecosystems, comprehensive work was launched to assess the current state of biodiversity and develop scientific rationales and feasibility studies for the expansion of some existing nature-protected areas, as well as for the creation of a new one. In addition, a training toolkit on biodiversity conservation and biosphere reserves was developed to increase young people's knowledge of biodiversity conservation.

Maps of Hope

In May 2020, leading scientists and environmental policy experts from around the world met with national stakeholders to create 'maps of hope' that identify Kazakhstan's essential life support areas (ELSAs). ELSAs are areas that conserve critical biodiversity and provide humans with essential ecosystem services, such as carbon storage, food, freshwater, water filtration, and disaster risk reduction. Kazakhstan is one of five pilot countries that will create 'maps of hope', which will guide where actions to protect, manage, and restore nature can enable Kazakhstan to deliver on its strategic priorities for biodiversity, climate, and sustainable development. The project will also create an interactive tool that can enable dialogue across sectors by showing trade-offs and synergies between different priorities. "There is also a growing demand for information on ecosystem services and natural capital, both from government bodies at all levels, users of natural resources (farmers and businesses), and research and educational institutions," said Askhat Kainarbekov, Chair of Forestry and Wildlife Committee, Ministry of Ecology, Geology and Natural Resources of Kazakhstan. The meeting in May was supported by the United Nations, the Ministry of Ecology, Geology and Natural Resources, the National Geographic Society, with the support of the Gordon and Betty Moore Foundation and the Global Environmental Facility (GEF). Since 2004, the United Nations has implemented 10 biodiversity conservation initiatives in Kazakhstan with financial support from the GEF, as well as through grants with the Kazakh government.[68]

United Nations Sustainable Development Cooperation Framework

Among these frameworks, there are two forest-related goals. The first is to achieve more than 4.7 percent of the forest area of the total area from the baseline of 4.7 percent (2018) by 2025. The second is to create more than 12,933,100 ha of forest area from the baseline of 12,933,100 ha (2018) by 2025.[69]

International Cooperation in the Field of Environmental Protection

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[68] United Nations, *United Nations in Kazakhstan ANNUAL REPORT 2020* (n.p.: The UN, 2020), 23.

[69] United Nations Country Team in Kazakhstan, *UN Sustainable Development Cooperation Framework Country Kazakhstan Year 2021-2025* (n.p.: The United Nations Country Team in Kazakhstan, 2020), 27-28.

Some intergovernmental agreements and arrangements in the field of ecology and environmental protection have been signed since independence in 1991. Kazakhstan has ratified the United Nations Framework Convention on Global Change (1992), the Convention on Biological Diversity (1992), and the United Nations Convention to Combat Desertification (1997) and is a signatory to the World Heritage Convention. Additionally, ascension to the following conventions is considered a priority for the country: the Convention on Wetlands of International Importance Especially as Waterfowl Habitat (Ramsar Convention), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), and the Convention on the Conservation of Migratory Species of Wild Animals (CMS).

The National Environment Action Plan

The National Environment Action Plan (NEAP) of Kazakhstan was initiated in 1995 for implementation in 1998-2000. It was supported by agencies such as the World Bank, the United Nations Development Programme (UNDP), the European Union and the EU Programme for Technical Assistance for the Commonwealth of Independent States (TACIS). The NEAP process was carried out by thematic working groups comprising experts from the government, academicians, non-governmental organizations (NGOs), and the private sector. Lack of forestry and state reserves was one of the environmental priorities identified.[70]

3.3. Forestry and Forest Products

Forests in Kazakhstan are rich in tree species. The main conifers are pine, spruce, fir, larch, cedar and juniper. The broadleaves are birch, aspen, alder, poplar, willow, oak, ash, maple and elm2. Most forests are in the north and east, as well as mountainous areas. Saxaul forests are widespread in the deltas of rivers, and on sandy massifs.

The forest growing stock is around 421.9 million m³, of which 63.1% are conifers and 32.6% deciduous – the remainder are saxaul forests. Mature and overmature stands comprise 88.24 million m³, 43.46 million m³ conifers and 44.78 million m³ broadleaved. The forests in the north and east account for 85% of the growing stock. The average growing stock of saxaul forest is 2.4 m³/ha.

Annual forest increment, excluding saxaul forests, totals 6.7 million m³ - around 1.58% of the total volume. Compared to 2008, there is a clear upward trend in growing stock, and in the forest area, which has increased by 5.13%.

Forests in Kazakhstan have been defined as protective forests, with an important role in maintaining regional environmental and socio-economic sustainability. Forest industry including harvesting is permitted, except within nature reserves. Wood harvesting is regulated by the Forest

[70] "Countries," *Fao.org*, last modified n.d., accessed Apr 19, 2021, http://www.fao.org/forestry/country/57479/en/kaz/.

Code, and other codes3 related to felling. Harvesting in mature and over-mature stands is in accordance with agreed management plans, within limits of allowable cuts. Wood is also removed through intermediate cutting for tending, selective sanitary cutting, or the rehabilitation of degraded or unproductive stands. The allowed intermediate cutting is based on data from forest inventories, among other sources. Other removals come from irregular cuts such as clearing for the construction of dams, roads, pipelines and fire breaks.

A "cutting ticket" is issued to harvest forest products, which gives forest owners or users the right to harvest and transport all primary and secondary wood products in the designated areas. It defines the type of forest resources, timing of work, conditions for regeneration of forests, clearing of site, required harvesting technologies, payment, and conditions for termination.

State forest owners compile summaries, which set out the annual allowance for intermediate and final felling of standing wood for forest users, including the State. These summaries are based on forest inventories, felling plans and local fuel requirements from the previous year.

The annual allowable cut is 2,579,000 m³, but wood removals have been around 350,000 m³ for the last decade – 366,000 m³ in 2018. Although this figure does not include wood from intermediate and sanitary cuts, it is still far below countries with similar forest resources, due to lack of processing facilities and efficient technologies. Between 2009 and 2018, almost 70% of harvested wood was used as fuel. This figure is reducing, and industrial wood accounts for a rising proportion of wood removals, reaching 43% in 2018.

Payment for cutting tickets is calculated by an algorithm set down by the Tax Code. This identifies parameters such as tree and shrub species, diameter classes, fuel wood, distance of logging sites to main roads, terrain, and steepness. Products can be held in roadside storage, before being moved to depots, and then transported to primary processing facilities. State forest owners or users are responsible for transport and can sell roundwood or sawn products within legally-set price limits. Seventy per cent of wood produced is sold in local regional markets. The remaining 30% are transported by rail to distant areas or exported.

Figures for 2019, show forest institutions provided 70 individuals or legal entities with 1,412,500 ha of forest fund plots, with long-term forest management plans.

3.3.1. Forest Sector Production

Wood

Since the 1970s, almost 97% of all forests have been classified as primarily protection forests with restricted cutting regimes, and two-thirds of them are excluded from any commercial timber harvesting. Traditionally, Kazakhstan was largely dependent on imported wood and wood products for industrial and consumer needs (mining, construction, furniture, paper). Most of the imports came from Russia. Since 1991 in Kazakhstan the total official timber harvest has decreased from 2.5 million m^3 to 0.9-1.2 million m^3 per year (compared with the annual

allowable cut of over 2 million m^3) and is now mostly used for local household needs (77% for fuelwood and 23% for sawlogs). The domestic wood-processing industry collapsed during the transition and wood imports have decreased. This was followed by a rapid increase in exports of unprocessed wood from Kazakhstan to China and Central Asian markets (66,000 m^3 legally and an estimated 200,000 m^3 illegally). Much of it is harvested unsustainably under the disguise of 'sanitary felling' of large areas of burned-over pine forests in the east. The collected forest and wildlife use fees and related taxes amounted to a mere US$ 3.1 million in 2001, while forest management costs were US$ 9.3 million.

Wood harvest amount and fuel supplies for 2015 are shown in the following Table 9.

Table 9. Production, consumption of forest products

Forest products supply	Year (2015)
Estimated total harvest (in thousand m^3 /year)	371
Estimated fuelwood supply (in thousand m^3 /year)	238
Share of fuelwood (%)	64
Energy value of fuelwood (TJ)	1,983
Ratio total harvest to growing stock (%)	0.1
Ratio total harvest to growing stock (in thousand m^3)	232
Consumption of forest products (m^3 RE/cap)	0.24

Non-Timber Forest Products

Important non-wood forest products in Kazakhstan include fruits and berries, nuts, fodder and forage, medicinal herbs, mushrooms, honey, and hunting. The forest reserves in Kazakhstan are very rich in flora and fauna, which gives them great potential for tourism and recreation.

Charges for secondary forest products and non-timber forest uses are levied from forest users at rates approved by oblast representative authorities called "Maslikhats"[71].

3.3.2. Forest Sector Trade

Although the forests of Kazakhstan make up a small part of its total area, they are concentrated mainly in the north and east, so there are opportunities for forest industry expansion. However, the current low supply of wood inhibits forest industry development, and low wood processing capacity inhibits industrial wood production.

Furthermore, data about forests, growing stock, and increment may be out of date. The volume of wood harvested annually is estimated as far below global averages. This would suggest that there may be a substantial base for all types of industrial wood production.

Fuelwood production has been around 70% of total wood production, with the rest classified as sawlogs, but the proportion of fuelwood is falling. This is promising but it shows that chipwood and fibre is not being used efficiently. Modern processing technologies can utilize almost every

[71] Andrey Kushlin, Tjaart Schillhorn Van Veen and William Sutton, *Kazakhstan-Forest Sector in Transition: The Resource, the Users and Sustainable Use* (Astana: The World Bank, 2010), 39.

piece of wood, so what is currently fuelwood could, alternatively, be raw material for a chip wood and fibre sector in Kazakhstan.

Since 2014, the broadleaved harvest in the birch and aspen forests of Akmola and Kostanay, has been less than 15% of the allowable cut. The absence of wood processing facilities and efficient technologies is a major factor leading to the underutilization of mature stands.

There are 641 registered wood-processing facilities, but only 332 are in use. Two of these are medium-sized, the rest are all small operations. There are no substantial facilities to produce chipboard, fiberboard and charcoal briquettes from low grade wood. Foreign investment is low. There are 15 direct foreign investments and 13 joint ventures. There is no precise figure for sawmill capacity, as individually owned small sawmills are not documented.

There is evidence that wood production and processing is steadily growing, particularly, in the north and east4. However, the forestry sector contribution to the national economy remains low at 0.087% of total industrial products $55,48 million USD in 2018.

The shortfall in supply of industrial wood and the inefficiency of the wood processing sector, coupled with increasing demand for wood products, have resulted in increased imports. In 2015, for example, only 19% of the 1,405,000 m³ wood consumption, was from domestic production.

In 2016, consumption fell to 637,000 m³, of which one-third was domestic production. The state has implemented programmes to meet the demand for processed wood products. In 2011, for example, the Favorite Limited Liability Partnership (LLP) project aimed to increase plywood production by 2,500 m³, expanding to include laminated plywood in 2015.

The Melissa LLP project led to plywood production of 30,000 m³, and in 2016, Kazgrupp LLP was established to produce environmentally friendly high-tech composite materials with an annual capacity of 400 tonnes of wood- composites. In all these cases, the roundwood was imported from neighboring countries.

Imports of wood products in 2018 were valued at $358 million, supplied primarily from the Russian Federation 78%, linked to its proximity, rich forest resources and well-established forest industry. The Customs Union free trade agreement, and the 50% fall in value of the ruble between 2014 and 2016, has greatly increased Russian imports.

Wood products are imported from many other countries, but the volumes fluctuate due to changes in political circumstances. Trading links have been established with many countries in different regions.

Exports are limited to surrounding central Asian countries such as Afghanistan, Kyrgyzstan, Tajikistan, and Uzbekistan, with even small amounts to the Russian Federation. Exports of wood products were $123 million between 2009-2018, rising to $26.5 million in 2017, and doubling to $52 million in 2018, showing a promising trend.

Particleboard, fiberboard and joinery products account for 72% of imported products, whereas most exports are roundwood or semi-processed products. This emphasizes the inadequacy of wood-processing capacity in Kazakhstan.

The pulp and paper industry reveals a similar picture. Despite the potential of under-exploited forest resources, the paper industry's share of manufacturing is insignificant at 0.6% in 20198, valued at $167 million. Domestic paper manufacture is growing steadily, mainly around Almaty Region, East Kazakhstan and Karaganda. At the end of 2019, domestic production of paper accounted for 24% of paper consumption.

Imports of paper products, such as uncoated paper, cardboard, boxes, bags and wallpaper reached $483.8 million in 2019, with the Russian Federation supplying 57%, then China, Finland and Germany. Exports of paper products in 2019, to Kyrgyzstan, the Russian Federation, Uzbekistan and Ukraine were valued at $24.6 million.

3.3.3. Forest Sector Employment

In the field of forestry, as of January 1, 2016, 11080 workers are employed, including 7650 people in forest institutions (69%), 3430 people in environmental protection institutions (31%). The most numerous category of employees is the state forest guard.

Assessment of the professional educational level of employees of forest and environmental institutions shows that the number of specialists with industry-specific education is only 33%, including 10% with education at university level and 23% with secondary professional education. The number of workers with higher education in non-major qualifications make up 13%.

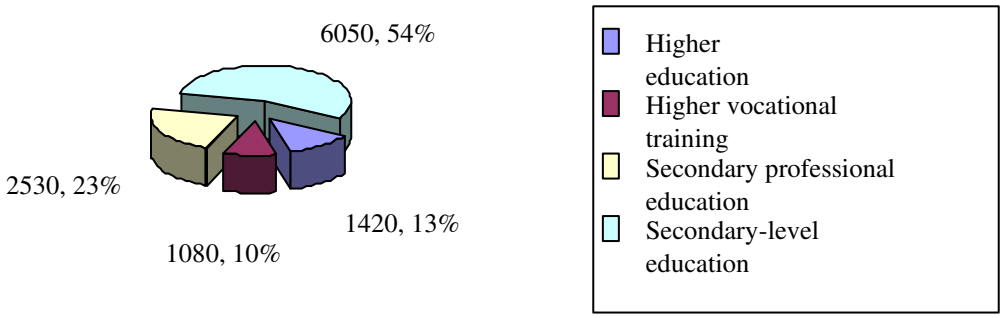

Figure 20. Proportion of forestry and PA workers by level of education, people

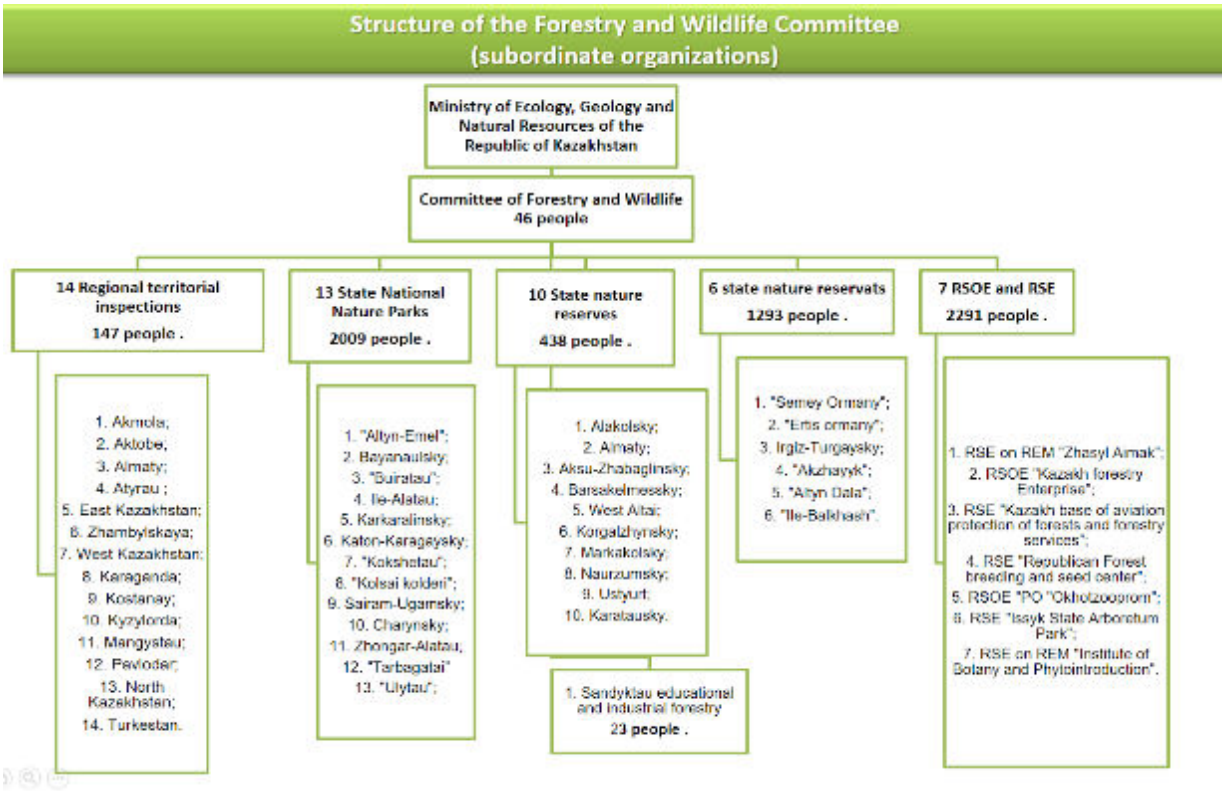

Figure 21. Structure of the forestry and wildlife committee

3.4. Forest and Climate Change

3.4.1. Roles of Forest Sector in National Climate Change Policy (NDC, etc.)

The observed annual temperature trends for the last 50 years in Kazakhstan were positive, increasing by 1.5°C. Taking into account that the greater part of the territory of Kazakhstan is occupied by deserts and semi-deserts, their ecosystems and many economic sectors, especially agriculture and water resources, are very vulnerable to climate change. According to climate change scenarios based on global climate modeling, further temperature increases with no significant gain in atmospheric precipitation may lead to a drier climate. In parallel, the climate zone boundaries may shift northward, and wheat yields may be reduced more than by 25%, grassland productivity may be reduced by 30– 90%, and sheep breeding is expected to be unfavorable. Some attention was given to research into climate change influences on the forests of Kazakhstan. The uncontrollable cutting of wood; forest fires, caused by both weather conditions and humans; less tree planting and forest rehabilitation works; and damage by insect pests—all these may lead to a reduction in the wood resources of Kazakhstan. Shifting climatic zones can lead to the destruction of wood ecological systems. Areas of particular forest communities could be reduced or even disappear.

Between 1936 and 2005, based on observation data from over 90 meteorological stations in Kazakhstan, the calculated linear trends in the mean air temperature time series and the sum of the atmospheric precipitation show that the climate of Kazakhstan in the period became significantly warmer. Winters in Kazakhstan are getting warmer, on average by 0.5°C per decade, while

warming less in summer, at 0.2°C per decade. This implies, in general, that there is an overall warming of 0.3°C per decade. The comparison of seasonal trends in different regions show that the east shore of the Caspian Sea increasing by 0.7°C per decade, while the positive tendency in winter is less, at 0.2°C per decade). The number of hot days is rising considerably in the regions of Kazakh hummocky topography (2.4 days per decade), but only 2.0 days per decade in the district of Mangyshlak. The number of cold days is decreasing in all regions of Kazakhstan, especially in the west and southwest of Kazakhstan, from minus 4.6 days to minus 7.7 days per decade in the district of Mangyshlak. In all regions of Kazakhstan, there is a reduction in the number of cold days, while the number of hot days in desert regions is increasing. A temporary tendency of extremely high daily temperature has a positive character in all Kazakhstan. Night temperatures are increasing considerably more than day temperatures. There are exceptions to this, such as in the higher areas of Kazakh hummocky topography, Gorny Altai, and the district near the Dzungaria Gates. It shows that nights (also in winter) in most parts of Kazakhstan are warming, and accordingly the daily and annual amplitude of air temperature is decreasing. In turn, it indicates decreasing continentality of the climate of Kazakhstan.

Climate change scenario constructions in Kazakhstan

While developing climate change scenarios, five double models of common atmospheric and ocean circulation were used, and five scenarios of atmospheric exhaust fumes concentration, as given in IPCC. The 1961 to 1990 period was accepted as the base period. From the information in Table 25, the worst precipitation conditions derive from the “hard” scenario, whereby 2085 there may be a northward zonal shift of 250–300 km. In this situation, all the northern districts of Kazakhstan will be in the semi-arid zone and the semi-arid zone will cover a very wide area. Other scenarios indicate much less of a northward zonal shift. Research into regional climate change scenarios for use in the research on the assessment of influences on southern and eastern Kazakhstan pastures indicated air temperatures rising in all seasons of the year in this region.

Scenario	Climate characteristics	2030	2050	2085
Medium	Change in average annual air temperature	1.4°C	2.7°C	4.6°C
	Change in total annual precipitation	+2%	+4%	+5%
Extremely high (hard)	Change in average annual air temperature	1.2–1.9°C (1.3°C)	2.5–4.0°C (3.0°C)	5.7–8.0°C (6.2°C)
	Change in total annual precipitation	-2– +8% (2.2%)	-4– +15% (3.7%)	8–28% (6.5%)
Extremely low (soft)	Change in average annual air temperature	1.5–2.2°C (1.7°C)	1.6–2.6°C (2.0°C)	3.1–3.4°C (3.3°C)
	Change in total annual precipitation	0-8% (3.0%)	-3– +9% (1.7%)	-2– +13% (4.1%)

Figure 22. Changes in average annual surface air temperature and annual total precipitation of GHG concentrations

In forestry, with a possible move to the south in mountain regions, the resistance of forest ecosystems implies eco-climatic zone boundary disturbances. The temperature and humidity changes may cause unsuitable conditions for pine, fir, larch, and cedar, and thus lead to changes in species compositions, with an increase in less valuable deciduous trees and shrubs. In mountain regions, the lower limit of spruce moving upward by 100–120 m will give way to deciduous softwood species and fruit trees. Fir plantings may disappear from the territory of Zhetisuiskiy Alatay, and they will remain only in a small area of East Kazakhstan. This high vulnerability of forestry to climate change is explained by the circumstances that the main species, such as pine, fir, cedar, and juniper, are at the southernmost border of their area, and are very sensitive to temperature and humidity regimes. Junipers grow on the northern border of their area and also are capable of reacting to changed climatic conditions. [72]

The greenhouse gas emissions calculated from the entire economy are shown in the following Figure 13. The list of greenhouse gases included in Annex A to the UNFCCC Kyoto Protocol includes carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6). [73]

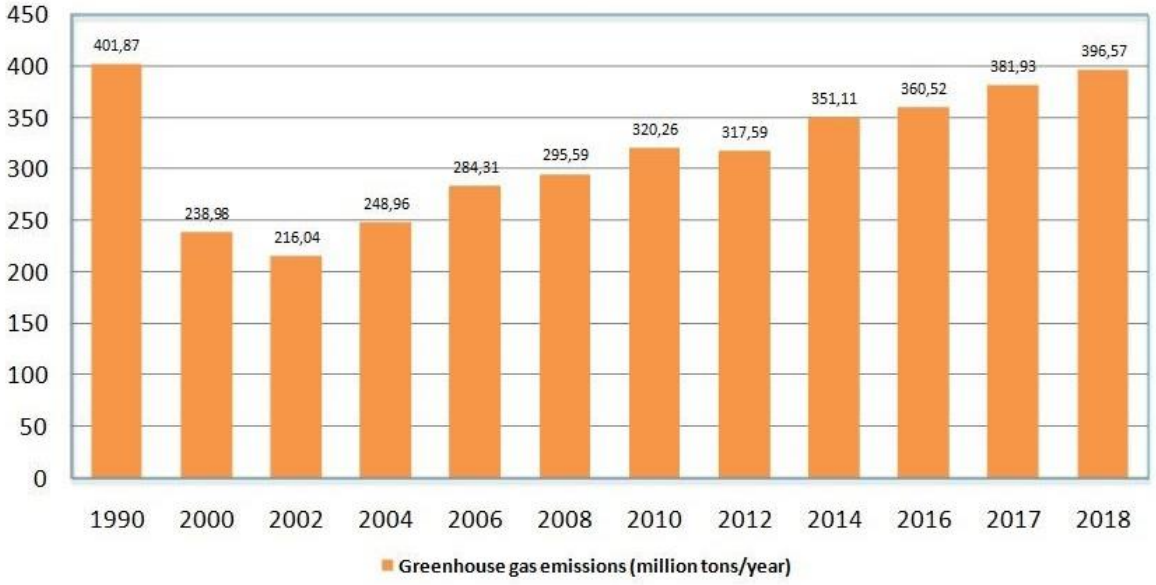

Figure 23. Greenhouse gas emissions

Roles of Forest Sector in National Climate Change Policy

Kazakhstan ratified the Kyoto Protocol in September 2009 and started actively participating in the international negotiation process on climate change mitigation and further GHG reduction. Climate Change issues are considered a very serious problem in the Concept of Ecological Security

[72] Irina Yesserkepova, *Kazakhstan* (n.p.: FAO, n.d.), 68-70.

[73] "Greenhouse gas emission," *Stat.gov.kz*, last modified Jan 18, 2021, accessed Apr 19, 2021, https://stat.gov.kz/ecologic/greenhouse_gas_emissions.

for 2004–2015. It implies further climate change studies of climate tendencies and assessments of climate change impacts. The Ecological Code of the Republic of Kazakhstan, which was accepted in January 2007, introduced accounting and control of GHG emissions both at the country level and at an enterprise level, to mitigate climate change impacts. The necessity of adaptation to climate change is still not included in governmental legislation. However, the development of the Adaptation Strategy of Kazakhstan is one important part of the Plan of Action of the Ministry of Environmental Protection - Road Map for 2010. Since 2009, Kazakhstan has been developing a strategy for low carbon economic development. The percentage of wooded land in Kazakhstan, including *Haloxylon* spp. and bushes, is 4.5%, while forests are only 1.2%. The forming of a propitious environment for stable forest regulation takes on an important significance in climate change conditions. Aiming at the realization of the governmental regulation of the Republic of Kazakhstan, No. 319 of 20 April 2007, the programme "Zhasyl El" for 2008– 2010 was developed and ratified, No. 958 of 16 October 2007. It planned to create forests on 145,180 ha and set the pattern for future work on forest protection and expansion.[74]

3.4.2. Climate Change Adaptation and Disaster Risk Reduction in Forest Sector Combating Desertification (2005-2015)

The Program on Combating Desertification in Kazakhstan is ground for launching Resolution of Kazakhstan No. 131 of 3 February 2004, "The Action Plan for 2004-2006 on implementation of the Concept of ecological security of Kazakhstan for 2004-2015". This program is led by the Ministry of Environmental Protection of Kazakhstan.

To combat and prevent the desertification process on the territory of Kazakhstan Objectives are as follows:

1. Phase I (2005-2007 years)
    A. Inventory and assessment of degraded lands;
    B. Informing and engaging all population groups in the process of decision making in the area of combating desertification;
    C. Development and implementation of the pilot projects on lands rehabilitation or prevention from their degradation.
2. Phase II (2008-2010 years)
    A. Development and implementation of normative legal requirements and economical mechanisms of sustainable land management, which ensure preservation and rehabilitation of resource base;
    B. Ensuring consolidated implementation of international ecological conventions;

[74] Irina Yesserkepova, *Kazakhstan* (n.p.: FAO, n.d.), 70.

C. Reducing the scale and preventing further desertification and the negative influence of droughts.

3. Phase III (2011-2015 years)

A. Integration of desertification combating measures into economic and social development of the country;

B. Combating and preventing lands from desertification and maintain their enabling and sustainable condition.

International cooperation provides a valuable opportunity in obtaining methodological, technical, and financial assistance from the international community and gives an impulse to combating desertification through the assistance. The following activities will be implemented to strengthen the international cooperation:

1. Phase I (2005-2007 years)

A. preparation and implementation of inter-state activities directed to reservation of transborder ecosystems balance;

B. formation of a Centre on combating desertification.

2. Phase II (2008-2010 years)

A. analysis and adaptation of the world practices and technologies in combating desertification;

B. strengthening cooperation in combating desertification within the framework of the Subregional program of activities on combating desertification in Central Asia, Regional plan of actions to promote sustainable development of highlands territories, Regional plan of actions on environment protection;

C. regional cooperation within the framework of the Thematic program's network in Asia;

D. creating approved reports and information collection procedures, methodologies of the sites and problems inventory, developing indicators, standards, and other relevant to the UNCCD, Convention on biodiversity, Framework convention on climate change data.

3. Phase III (2011-2015 years)

A. implementation of pilot projects on relevant conventions, seeking practical, experimental (methodological) and presentation (informational-promotional) goals;

B. mobilization of external resources in the form of technical, expert, and financial assistance to implement the Convention to combat desertification. [75]

Forest Fire and Pest Management

Fire and pest management has become an increasing concern in many countries. Fires are part of the natural ecosystem cycle, but the great majority (90%) are caused by humans. The main reason for a major increase in severity and extent of fire impact (i.e. area burned) is due to the lack of timely fire detection and control which deteriorated because of the lack of financing. Also, rural people on farmland adjacent to forests, tend to burn off vegetation and such fires may accidentally spread to forests. Public budgets for fire and pest management have declined, and there is a need to shift expenditures from suppression of fires or pest outbreaks that have already started, to fire prevention and public awareness (which is much more cost-effective).

In addition, and linked to budget, finance, and governance issues, some fires may have been deliberately started to circumvent the 'no cutting' rule for healthy forests. Fire-damaged timber is presently allowed to be harvested for sanitary reasons at low stumpage prices and can be a lucrative source of income. Fires and pests are a major concern in the north and northeast, especially in the relic pine forests of the Irtysh River watershed where over 100,000 hectares were severely damaged by fires in 1997 and are being increasingly damaged by pests and uncontrolled 'sanitary' cutting since then.[76] [77]

Local communities have negative effects such as forest fires, unauthorized cuttings, the takeover of lands, haying, and poaching. However, they may have a positive effect on control and Prevention. According to the existing fire safety regulations for the forests of Kazakhstan and the approved decisions of oblast akimats, timber, and other enterprises, farms adjacent to forests and voluntary fire-brigades are required to take measures to put out forest fires with their forces and equipment. Additionally, local communities also play a positive role in protecting forests from pests. Every year in spring, local communities, schoolchildren, in particular, whitewash tree trunks to the breast level, thus protecting them from sunburns and pest migrations. Nestling boxes for migrating birds are set up and are of great help in fighting forest pests. Gardeners and individuals tend to their plots, also contributing to the extermination of various forest pests. Sustainable grazing and cutting of grasses for hay are also some of the indirect factors protecting forests from fires.[78]

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[75] Government of Republic of Kazakhstan, *The Program on Combating Desertification in the Republic of Kazakhstan 2005-2015* (Astana: The Government of Republic of Kazakhstan, 2005), 3-13.
[76] Andrey Kushlin, Tjaart Schillhorn Van Veen and William Sutton, *Kazakhstan-Forest Sector in Transition: The Resource, the Users and Sustainable Use* (Astana: The World Bank, 2010), 17-18.
[77] "Be a thrifty master of the forest!" *Gov.kz*, last modified Jul 08, 2020, accessed Apr 19, 2021, https://www.gov.kz/memleket/entities/kostanai-karabalyk-audany-akimat/press/news/details/78563?lang=en.
[78] Andrey Kushlin, Tjaart Schillhorn Van Veen and William Sutton, *Kazakhstan-Forest Sector in Transition: The Resource, the Users and Sustainable Use* (Astana: The World Bank, 2010), 50.

3.4.3. Global Partnership for Forest Protection

The Republic of Kazakhstan is a member of more than 30 international conventions and protocols in the field of environmental protection, including the UN Convention on Biodiversity (CBD), the Cartagena and Nagoya Protocol to it, the UN Convention to Combat Desertification (UN CCD), the UN CITES, the UN Convention on Wetlands of International Importance, mainly as habitats for waterfowl and others.

Kazakhstan actively supports cooperation in this area within the framework of the CIS and the EEU. In particular, the Republic of Kazakhstan, the Republic of Armenia, the Republic of Belarus, the Kyrgyz Republic, the Republic of Moldova, the Russian Federation and the Republic of Tajikistan signed an agreement on cooperation in the field of the timber processing industry and forestry in September 1998. In accordance with this Agreement, the Parties created an Intergovernmental Council for the Timber Processing Industry and Forestry, which organizes and coordinates this work and contributes to its development. During the period of the Agreement, the Parties held 16 meetings of the Intergovernmental Council on various issues of forestry and the forest industry. In 2014, they adopted the main areas of cooperation of the CIS member states in the forestry and forest industry, which expressed a common opinion on creating conditions for sustainable and dynamic development of the forest sector of the economy, ensuring economic security and meeting the needs of citizens in high-quality products and beneficial properties of forests.

In September 2011, an Agreement was signed between the Government of the Republic of Kazakhstan and the Government of the Russian Federation on the establishment of the Altai Transboundary Reserve. The purposes of the creation of the reserve are:

- Conservation of biological and landscape diversity of the mountainous part of Altai;

- Promotion of bilateral cooperation in the field of environmental protection and rational use of natural resources, taking into account environmental, social and cultural aspects;

- Environmental monitoring and study of natural complexes and objects;

- Development of environmental education of the population and ecological tourism. Work on the creation of this reserve is ongoing.

3.5. Human Resources and Institutional Capacities in Forest Sector

3.5.1. National Forest Administrative Capacity

Forest management is carried out at the republic and local levels. The Forestry and Wildlife Committee of the Ministry of Ecology, Geology and Natural Resources (FWC) operates at the republic level. There are 46 staff at the FWC head office.

Additionally, there are 14 regional offices with 147 staff. The FWC includes service organizations of forestry: Republic State Owned Enterprise (subsequently referred to as - RSOE) Kazlesproekt (500 staff); RSOE Kazakh base of aviation services for forestry (310 staff); RSOE Republic Forest Breeding and Seed-Breeding Centre (198 staff); Republic State Enterprise (subsequently referred

to as – RSE) Zhasyl aimak (519 staff) and 29 environmental institutions with 3,509 staff. Currently, the environmental institutions have on average, only 70% of the material and technicalequipment prescribed by national standards.

At a local level, the regional akimats are in charge of 120 state forestry locations, with 7,000 employees. These forestry institutions have on average, 65% of the material and technical equipment laid down in national standards. Forestry reforms in 2003, transferred responsibility for forest management of 80% of forest fund land to akimats, which have established units to carry out forest management.

It is estimated that at the beginning of 2020, forestry employed 15,900 people. There are nine higher education and two secondary special institutions that offer specialist training in forestry and the forest industry. About 500 people graduate annually, including 400 people in the specialties of higher professional education, and 100 people in the specialties of secondary professional education. The main factors that deter people from studying forestry are:

- Low salary.
- Insufficient prestige of the profession.
- Low motivation for quality work.
- Insufficient professional level of managerial and working personnel.
- Increasing urbanization and rural depopulation.

As a result, there is a shortage of specialists in forestry, which limits the ability to carry out reforestation work.

3.5.2. Research and Development

Forest science is represented by a number of research institutes and specialized higher educational institutions, as well as scientific departments of environmental institutions. The leading scientific centre is the Kazakh Scientific Research Institute of Forestry and Agroforestry (KazRIFA). Separate studies are carried out by the Kazakh National Agrotechnical University named after Seifulin in Nur-Sultan, the Kazakh National Agrarian University and the Kazakh Research Institute of Plant Protection and Quarantine (mainly for the southern and southeastern regions), the Southwest Research Institute of Livestock and Crop Production (for introduction in Southern Kazakhstan) in Almaty.

Scientific research in forestry receives little priority and there is a lack of funding.

The former system of experimental and test stations and ranges of the 1980s has been lost. Scientific personnel are ageing, which impedes the influx of young researchers into scientific institutions of forestry. Local executive bodies that manage more than 70% of forests do not take part in research.

3.5.3. Forest Education and Training

Currently in the republic, 35 educational institutions are licensed to train specialists for forestry and hunting sectors, 8 of them are higher educational institutions, 24 are secondary professional educational institutions, and 3 are vocational schools.

Most of these schools are characterized by a weak logistics and educational base. The curricula used by them for specialized subjects do not meet today's requirements. In a number of higher educational institutions that implement forestry and hunting sector programs, the training load is only from 1 to 10 students per course.
Over the past ten years, 975 grants were allocated for higher education in forestry and hunting sectors, but very few graduates were employed in the forestry system. The capacity building of forestry workers in recent years has been insufficient.

Until 2004, the Institute of Professional Development for Forestry Workers existed in the city of Schuchinsk, which annually conducted advanced training courses at the expense of the republican budget. With the introduction of a market economy, the maintenance of the institute became unprofitable, and it was wound up. Hereafter professional development courses were carried out at the expense of forestry and environmental institutions.

In the period from 2005 to 2007, at the expense of UNEP funds, together with the Scientific and Educational Center “Zapovedniki” (Moscow), a project was carried out to establish and operate a scientific and educational center in the republic.
In 2016, professional development courses were created at the KazSRIFA LLP. The professional development courses at the “Kazakh Scientific Research Institute of Forestry and Agroforestry” LLP were established according to the instructions of the President of the Republic of Kazakhstan Mr N.N. Nazarbayev (Minutes of the meeting with the participation of the President of the Republic of Kazakhstan № 01-7.2 of February 24, 2006, paragraph 8).
The Institute developed a program of republican professional development courses for forestry workers and PA employees for 2017-2019.
The goal of the Program is to expand, deepen and update the previously acquired theoretical and practical knowledge of forestry workers and PA employees in accordance with the increasing requirements for the sustainable development of forests and preservation of biological diversity.

In order to ensure the quality and high level of teaching, as well as full coverage of PA workers and forestry specialists with training, the Professional Development Program consists of four independent training programs. Each curriculum is scheduled to train specific groups of students. For example, the first curriculum is designed to train the heads of state forestry institutions, PAs and their business units, private forestry entities and subordinate organizations of the Forestry and Wildlife Committee; the second is for engineering and technical workers, foresters; the third is for forest craftsmen, inspectors of PAs, specialists of subjects of private forest husbandries and subordinate organizations of the Forestry and Wildlife Committee; the fourth is for financial workers and public procurement professionals.

The formation of a contingent of audience members is carried out on the basis of applications and contracts with legal entities and individuals. 40 school hours are given to each group of students. The curriculum theme includes four main topics:

1. Organization of forestry and forest fund use;
2. Protection and security of the forest fund;
3. Reproduction of forests and forestation;
4. Forest legislation.

Each topic is divided into subtopic topics, which, depending on the contingent of students, have their own differences. The relevance of the program is provided by the considered issues on innovative achievements in forestry, on advanced domestic and foreign experience, on the latest changes and amendments to forest legislation, legislation on PAs and public procurement. In the classroom, students will have the opportunity to share work experience, analyze the current situation in the work and work out solutions for it.

Classes are organized using lectures, workshops and practical studies, discussions, exchange of opinions, defense of papers on a given topic, demonstration of scientific and thematic films, by solving situational problems, group discussion, visiting scientific objects and advanced organizations of forestry and PAs.

Faculty members are full-time and freelance employees of the KazSRIFA LLP, who have a scientific degree and academic title, as well as the employees who have extensive practical experience in the field of forestry in various regions of Kazakhstan.

Upon completion of the professional development courses, students will acquire skills and knowledge about the ways to ensure rational, continuous, non-depleting use of forest resources, about preserving and developing the system of PAs, on using normative legal acts in the field of forestry and PAs, on operative decision of production tasks and implementation of planned activities.

A certificate is issued to the persons who have completed the professional development courses. The professional development courses at the KazSRIFA are distinguished by a number of significant advantages: brevity of training; flexible schedule of the educational process, allowing to minimize the period in isolation from the main work; variability in the choice of study locations; progressive, energetic, student-centered learning methods; the ability to develop and implement educational programs at the request of clients.

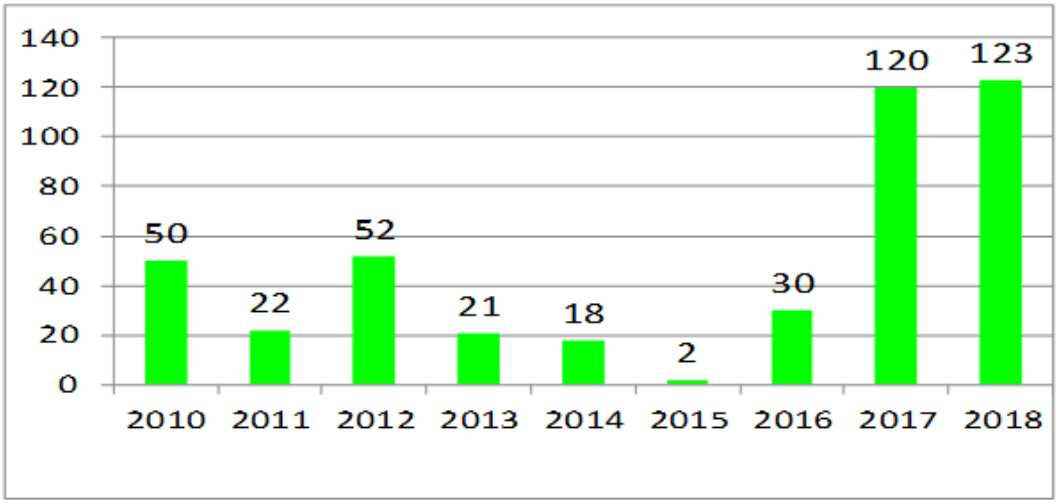

Figure 24. Dynamics of professional development courses for forestry workers and PA employees

In order to improve the quality of training for the forest industry, staffing the forest sector requires the implementation of a multi-level vocational education system, while simultaneously optimizing the network of educational institutions.

It also requires expanding the training of skilled workers by opening an additional number of vocational schools, short-term courses, developing apprenticeships, individual internships and mentoring. It is necessary to introduce new specialties (“Green building”, “Landscape design”, “Flower cultivation”, “Forest economy”, “Organization of forest use”, “Wooden constructions”, “Reserve management and studies and management of protected areas”, “Game management”, etc.) having a predominantly commercial and environmentally friendly nature. To overcome the acute shortage of specialists in forest management and marketing, accounting, genetics and plant breeding of woody plants, biotechnology and cell engineering, mechanization of forest production, informatization, protection of the forest from pests and diseases, it is necessary to resume training of mid-level personnel in certain secondary specialized colleges. The material, technical and educational base of educational institutions needs to be improved; the control over the quality of training and practical studies of specialists needs to be enhances.

4. Challenges and Opportunities in Forestry Sector

4.1. Challenges

4.1.1. Forest Protection and Restoration

1) Biodiversity: Habitats have been damaged by nascent forest industries, human habitation, and imported diseases. One example is in the forests of Kyzylorda and northern Kazakhstan, where the bacterial dropsy disease (cancer-vodianka) is spreading rapidly and killing large numbers of birch trees. Other infestations may be happening, but there are limited resources for detection, prevention and alleviation. Currently, sustainable biological control methods are not widely used.
2) Fire: Fortunately, there has been a decrease in the frequency of fires in recent years. However, national forests are still threatened by constrained ability to tackle fires – due to lack of investment, most fire-fighting equipment is obsolete. This is compounded by a shortage of qualified staff in the Kazakh Research Institute of Forestry and Agroforestry. Furthermore, whilst fires have diminished in frequency, they have increased in area due to limited detection resources, including restricted satellite observation capacity, for early detection of fires.
3) Poaching: Poaching and illegal harvesting, particularly of saxaul, continue to be major problems. Since January 2018, 419 cases of illegal logging have been recorded. These involved 28,553 m³ of timber, resulting in $2.2 million in damage, despite new laws criminalizing illegal logging and damage, and banning saxaul logging until 2021. The profitability of the black market for wood, to meet a growing demand, only increases the problem.
4) SFM: Kazakhstan has improved the system of reporting and monitoring forest use by developing a national set of Criteria & Indicators (C&I) for SFM. There is no funding to implement these, currently.
5) Reforestation: Reforestation and afforestation have decreased since 2015, despite a commitment to achieve 5% forest cover by 2030. This will need 110,000 ha to be established every year from 2021. On average, only 53,000 ha had been established annually, between 2013 and 2018.
According to the instruction of the President, work is underway to plant 2 billion trees on the territory of the state forest fund, this requires additional financial resources for research, design and survey work to create forest nurseries.

4.2.Opportunities

4.2.1. Potentials

1) Improving equipment: Replacing obsolete equipment for forest protection, planting and growing saxaul trees, and setting up legal markets for sale of their wood.
2) Early detection of forest fires: Installing optical-sensory systems in areas with the most severe forest fires, as well as using unmanned aerial vehicles combined with aerial firefighting. Holding forest fire-fighting training courses for forest managers.
3) Improving forest pathology surveillance: Updating statistical information on forest pests and diseases and improving collection and analysis of forest health information. Setting up a central

forest pathology service to monitor forest pathology, plan control measures, and organize forest pathology training courses. Scaling-up biological control for pest management: Research and breed forest entomophages to regulate harmful insects. Study the pathology of the Kyzylorda saxaul and North Kazakhstan birch forests to aid their recovery.

4) Expanding forest area through natural regeneration: Akimats and the FWC will identify feasible areas and implement natural regeneration.

5) Expanding forest fund land by including non-accounted forests: An estimated 300,000 ha of forest is not currently registered in the fund. These will be identified by the RSOE Kazlesproect, using satellite imagery and GIS technology, to be registered and managed by relevant institutions.

6) Expanding SPNAs in the State Forest Fund: Continuing to identify and protect key forest habitats for endemic, rare and endangered species. As a result, by 2025, there should be two more national parks and three natural reserves, enlarging protected areas from 8% of land area to 10% - 12%. Protected area zoning will be adjusted, and five-year management plans updated. Two ecological corridors will be set up on the main migration routes of large mammals.

7) Conserving species, objects and ecosystems: Establishing a forest seed bank, with an archive of the wild Malus sieversii apple tree clone. Continuing to secure a stable population of 500 Przevalski's horses in Central Kazakhstan, and reintroducing Bukhara deer to the Syr Darya river floodplain. Deer will also be resettled in the new Ile-Balkhash state reserve, as part of the long-term Turanian Tiger Restoration Programme. Reintroduction of the snow leopard will begin, coupled with protection of the critically endangered saiga antelope.

8) Develop assessment methods: By 2022, developing methodology to assess the effectiveness of forest and wildlife management, as well as the economic contribution of ecosystem services.

Improving legislation on genetic resources: By 2030, the Law on Genetic Resources and byelaws will be adopted. A National Coordination Centre for access to genetic resources as well as a seed bank of especially valuable and rare tree species, will be created.

9) Establishing a network of tree breeding and seed centres: By 2023, establishing a network of tree breeding and seed centres covering all Kazakhstan natural zones, as well as an archive of valuable or endangered tree species.

10) Organizing wood processing: Supporting broad leaved and low-grade wood processing in East and North Kazakhstan.

12) Establishing industrial and energy plantations: Establishing new plantations of fast-growing trees to supply wood for manufacturing industries and energy, leading to new processing plants.

11) Developing ecotourism: Update zoning schemes in national parks with current information about ecosystems and biodiversity, assessing tourism potential based on regional plans and the state tourism programme. Develop indicators to measure ecosystem changes linked to recreational activity and tourism. Improve tourism infrastructure by implementing master plans for national parks and developing ecological passports of trails and routes. Develop the visitor information infrastructure. Offer environmental education, linked to protected areas. Provide tax incentives for developing sustainable tourism in protected areas and their adjacent territories.

12) Evaluating forest ecosystem services:

Determine the monetary benefits from forest ecosystems.

Estimate the share of natural capital in the country's GDP.

Determine and account for the economic value of forests.

Form a system of non-tax payments for forest ecosystem services.
Identify forest users who pose a threat to forest ecosystem integrity and gain their support by involving them in environmental measures to conserve forests.
13) Developing and using a model forest information system (including implementation of SFM C&I).
Services in charge of forest-related information and data processing/analysis.
Systems for disseminating forest information (including National Forest Data Banks).
Methodologies for data collection and processing.
Developing a holistic forest information system: This will include:
14) Benefit from international experience: Longstanding international cooperation will be enhanced through regional and bilateral collaboration programmes, examining international best practice in restoring river basin forest ecosystems. Private sector investment in the forest industry will be sought, and public-private partnerships in forestry, seed sources, and nurseries will be considered.
15) Research forest cover increase and sustainably managing forest resources: This refers to both human and technical resources, and should create forest research employment, particularly for young people.
16) Developing a forestry scientific-technical nexus: This should enable coordinated research, developing the sector, as well as ensuring implementation of new technologies and ensuring cooperation among policy makers, researchers and practitioners.
17) Develop training for the forest sector workforce: This will enable the forest sector workforce to deliver SFM.
18) Payment for Environmental Services: Climate change will affect ecosystem services – research will be needed on how these can be safeguarded. Identifying ecosystem service beneficiaries and establishing fees should be a longer-term goal. Payments for environmental services (PES) help allocate forest management resources and inform resource decisions. A PES system could generate finance for investment in conservation work and could encourage private sector involvement, creating a market for ecosystem services. Payment mechanisms should use established international methods and account for the supply, demand and economic value of ecosystem services. This will need a favourable legal base, an institutional framework, and to use monetary and non-monetary values.
19) Increasing carbon sequestration: Carbon uptake will be enhanced by reducing forest loss, reforestation and afforestation. Afforestation should be regionally targeted and coordinated with other sectoral plans for climate change adaptation. Efforts will be made to attract international finance and business investment, relying on market and non-market approaches.

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