

Cholpon Chotaeva

GEOGRAPHY OF KYRGYZSTAN

Lectures for students of undergraduate
educational programs



Bishkek
2021

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*Approved by the Ministry of Education and Science
of the Kyrgyz Republic as a textbook for students of higher
educational institutions*

Chotaeva Cholpon

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“Geography of Kyrgyzstan” has been designed for those undergraduate students who have been instructed in the English language in the colleges and universities of Kyrgyzstan and are required to take the course on Geography of Kyrgyzstan as part of their general educational requirements and then pass the combined state exam on History and Geography of Kyrgyzstan, Kyrgyz Language and Literature after the second year of their study.

The Textbook can be also used by those people who are interested in the physical and socio-economic geography of Kyrgyzstan.

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PREFACE

The idea to write this textbook “Geography of Kyrgyzstan” came in 2019 when the Ministry of Education and Science in the Kyrgyz Republic issued an order to introduce the new required general educational 2-credit *Geography of Kyrgyzstan* course in all higher undergraduate educational institutions of Kyrgyzstan along with the state exam on it after the second year of study. The intention of the Ministry of Education and the objective of the new course was to provide a basic information on the physical and socio-economic geography of Kyrgyzstan to all undergraduate students studying in the higher educational institutions of Kyrgyzstan regardless of their major programs.

The main problem I faced when I started teaching this course at the American University of Central Asia was the absence of any organized information on the geography of Kyrgyzstan in the English language. It was quite hard to find any adequate textbooks on the topic even in Russian. Therefore, I decided to write my lectures on Geography of Kyrgyzstan for undergraduate students and publish them in the form of a textbook.

Since Geography of Kyrgyzstan is a short course, there are not many topics included for students in the course. There are five main topics in the course: geology and relief, flora and fauna, population, economy, transport and services. The same order of topics will be used in the present book “Geography of Kyrgyzstan”.

I would like to express my sincere gratitude to Stalbek Akhunbaev, the Rector of the International Higher School of Medicine, for his generous support and funding this book. I have to note that it is the second book that is being published at the expense of the International Higher School of Medicine. The first book “History of Kyrgyzstan Lecture Book” published with the help of the International Higher School of Medicine in 2016 is widely used not only by the students of the International Higher School

of Medicine but by students in many other universities and even secondary schools of Kyrgyzstan who are instructed in English.

I am also very thankful to Zheenbek Kulenbekov, PhD, the Associate Professor at the American University of Central Asia, and Sagynbek Orunbaev, Candidate of Physico-Mathematical Sciences, the Associate Professor at the American University of Central Asia, for sharing with me their information and maps on the geology of Kyrgyzstan.

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INTRODUCTION

Kyrgyzstan, officially the Kyrgyz Republic, is located in the heart of Asia, the region called Central Asia.

Central Asia is the term used for the former republics of the USSR such as Kazakhstan, Uzbekistan, Kyrgyzstan, Turkmenistan and Tajikistan. It occupies the territory from the Caspian Sea in the west to the Altay Mountains in the east, from Kazakhstani steppe in the north to the Pamir Mountains and Karakumy Desert in the south. In the broader meaning of the term, Central Asia includes the territories of present-day Afghanistan, Pakistan, Northern Iran, Western China, Southern Russia and Mongolia.

Prior to the 19th century, the region including Western China was referred as *Turkestan* because it was mainly occupied by Turkic speaking communities. In the 19th century, when the Russian Empire colonized the region, it was named *Russian Turkestan*, and during the Soviet time, the official term used became *Middle Asia and Kazakhstan*. The term *Central Asia* in relation to the region has been introduced in the 1990s following the collapse of the Soviet Union and declaration of independence by the former Soviet republics of Central Asia.

Kyrgyzstan is a landlocked mountainous country that borders on Kazakhstan (1 212 kilometers of the border) in the north and northeast, Uzbekistan (1 314 kilometers of the border) in the west, Tajikistan in the south (984 kilometers of the border), and China (1 063 kilometers of the border) in the south and southeast. Kyrgyzstan occupies 199.9 square kilometers. It stretches 900 kilometers from the east to the west and 410 kilometers from the north to the south (Hays, *Land, Geography and Weather of Kyrgyzstan*).

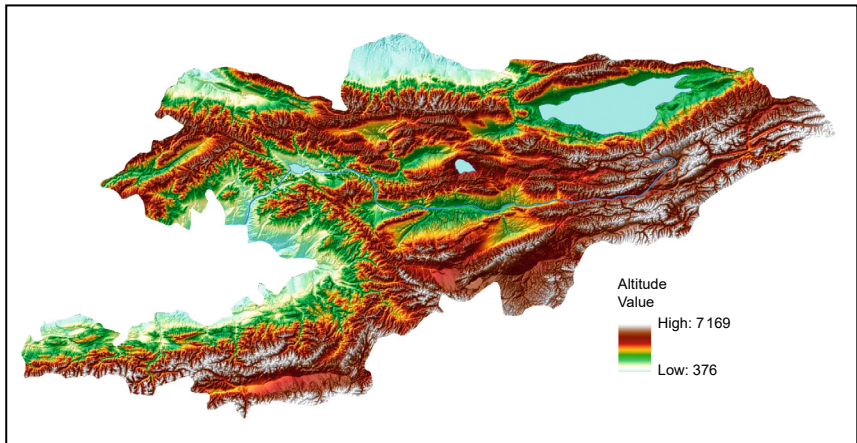
1 TOPIC

GEOLOGY AND RELIEF

1.1. Background

The Kyrgyz Republic is a mountainous country. More than 94% of the territory in Kyrgyzstan is located at the altitude of 1 000 meters and more above the sea level with the average altitude of 2 750 meters above the sea level. The lowest point in Kyrgyzstan is located in its western part that is 401 meters, while the highest point is in the east that is *Pobeda Mountain* (Victory Mountain) of 7 439 meters. More than three quarters of its territory is located at the altitude of 2 000 meters above the sea level (Kulmatov 7).

Figure 1.1. The territory of Kyrgyzstan by altitude



Source: This map was adopted from Sagynbek Orunbaev, Candidate of Physico-Mathematical Sciences, the Associate Professor at the American University of Central Asia, Kyrgyzstan.

Geographically, the territory of Kyrgyzstan is divided into three zones. The first is the Low Mountain Zone that is 400—1 500 meters above the sea level. The second zone is the Moderate Mountain Zone of 1 500—2 000 meters. And the third High Mountain Zone is 2 000 meters and higher (Kulenbekov and Orunbaev). The first zone consists of steppes used for intensive agriculture, the second represents steppes and forests rich in flora and fauna, while the third zone is occupied by alpine and subalpine meadows combined with snow and glaciers.

Therefore, the territory of Kyrgyzstan is classified as highlands. More than half of its territory (57%) is located at the altitude over 2 500 meters above the sea level and almost a quarter of it (23%) above 3 500 meters. Only 20% of Kyrgyzstan is associated with the areas of comfortable living conditions where the majority of its population permanently resides, and economic activities are mainly concentrated on (Kulenbekov and Orunbaev).

1.2. Geology

The mountainous systems of Tian Shan and Pamir created in the center of the Eurasian continent have caused different natural conditions in different geographical regions despite their common geological development. The Tien Shan and Pamir Mountains have appeared as a result of the collision between the Indian subcontinent and Eurasian plates, and brought to the deformations of Tien Shan. The tectonic process is still on (Kulenbekov and Orunbaev).

The Tien Shan Mountains have been composed mainly of crystalline and sedimentary rocks of the Paleozoic Era that formed about 540—250 million years ago. The basins that lie between the mountains have been filled with younger sediments created mainly by the erosion of rivers. Granitic rocks predominate over much of the area in the north and the east of Tien Shan (Kulenbekov and Orunbaev).

The northern and eastern parts of the region underwent folding during the early Paleozoic Era when the mountain-building period took place. It uplifted dry land, so that its original sedimentary

cover was almost completely destroyed by erosion. However, the southern and western parts of Tien Shan were basically created of sedimentary metamorphosed (structurally changed by heat and pressure) rock as well as intrusive and volcanic rock to a lesser degree. These regions experienced folding during the late Paleozoic Era (Kulenbekov and Orunbaev).

The new stage of development began about 25 million years ago and had been continuing till present. It is characterized by the sudden movements of the Earth's crust. Loose fragments of rock slid into the valleys and formed accumulations. They are almost eight kilometers thick and are found in the Fergana Valley. Shallow lakes were formed in many valleys. Their later evaporation left many salty deposits (Kulenbekov and Orunbaev).

Consequently, glaciers have produced moraines that comprised boulder-rich sediments in the mountains, while gravel (water-lain sediment) and loess (wind-deposited sediment) have accumulated in the valleys. The zones of faulting are usually observed along the boundaries between the ridges and valleys. Large-scale horizontal movements have taken place along the great Talas Fergana Fault that traverses nearly the entire Tien Shan system along the northeastern slopes of the Fergana Kyrka Mountains and its northwestern extension. The deep faults are associated with catastrophic earthquakes (Kulenbekov and Orunbaev).

1.3. Mountains

There are two mountainous systems in Kyrgyzstan, the Tien Shan Mountains and the Pamir Mountains. The Tien Shan and the Pamir Mountains are among the highest mountainous systems in the world comparable to Himalayas, Karakoram and Hindu Kush. While the Tien Shan Mountains are located mainly on the territory of northern Kyrgyzstan, the Pamir Mountains are in southern Kyrgyzstan.

The mountains are separated by gorges and valleys. While gorges are formed by rivers, valleys are much broader plateaus that represent the most fertile and populated territories of Kyr-

gyzstan. The lowest and the flattest of the valleys in Kyrgyzstan are the Chui and Talas Valleys in the north, and the Fergana Valley in the south. These three valleys can be included into the Low Mountain Zone, since they are located at the elevation of 400—1 500 meters above the sea level.

The Tien Shan Mountains cover the territories of three states: Kyrgyzstan, Kazakhstan and China. The name *Tien Shan*, translated as *Celestial Mountains* from the Chinese language, could be a direct translation of the Kyrgyz name of the mountains *Tenir Too*. The Tien Shan mountainous system dominates in the southwest and east of Kyrgyzstan along the boundary of Kyrgyzstan with China ranging from 394 meters above the sea level in the Fergana Valley near Osh city up to 7 439 meters of Pobeda Mountain, the highest mountain in Kyrgyzstan. The second highest mountain in Tien Shan is Khan Tengri Mountain that is 7 010 meters above the sea level located to the east from the Issyk-Kul Lake on the border between Kyrgyzstan, Kazakhstan and China.

The major Tien Shan ranges include *Kungey Ala-Too* and *Zailiyskiy Alatau* between Almaty city and the Issyk-Kul Lake, *Terskey Ala-Too* between the Issyk-Kul Lake and China, Central Tien Shan with the highest Pobeda and Khan Tengri Mountains to the south of the Issyk-Kul Lake, *Kyrgyz Ala-Too* in northwestern Kyrgyzstan that separates Chui oblast from Naryn oblast and then Talas oblast from Kazakhstan, *Talas Ala-Too* in the south of Talas oblast, and *Fergana Range* that separates northern Kyrgyzstan from southern Kyrgyzstan in the northern part of the Fergana Valley (Hays, *Land, Geography and Weather of Kyrgyzstan*).

The Pamir Mountains, known as the *Roof of the World*, are located on the territories of four states: Kyrgyzstan, Tajikistan, Afghanistan and China. The Pamir Mountains are called Alai in Kyrgyzstan. They are located in the south of Kyrgyzstan on the border between Kyrgyzstan and Tajikistan. The highest mountains of Pamir system are *Communism Mountain* located in present-day Tajikistan that reaches 7 495 meters, and *Lenin Mountain* located in Kyrgyzstan that reaches 7 134 meters. Lenin Mountain is considered to be the second highest mountain in Kyrgyzstan after Pobeda Mountain.

1.4. Water

Water is one of the most valuable natural resources in the world. Unlike other countries in Central Asia, Kyrgyzstan is rich in water. Water resources of Kyrgyzstan can be divided into surface water and ground water. Surface water is represented by numerous rivers, lakes and glaciers in Kyrgyzstan, while ground water is the main source of drinking water in the country.

Kyrgyzstan has substantial reserves of ground water. Most of ground water reserves are found in mountainous areas. Out of 44 reserves explored, 20 can be used for drinking, household and industrial water supply, while the remaining can be used for irrigation. The total volume of operating ground water is 16 260 thousand cubic meters. Ground water provides 90% of the centralized water supply, and it is available to 80% of population in Kyrgyzstan (*Underground fresh and mineral water*).

1.5. Rivers

There are more than 40 000 rivers and streams in Kyrgyzstan with a total length of 150 000 kilometers. Most of rivers and streams are fed by the meltwater of glaciers and snowfields in the mountains. Kyrgyzstani rivers are predominantly mountainous and therefore not navigable (*Rivers*). Nevertheless, they are widely used for irrigation and generating hydroelectric power.

Two largest and the most important rivers of Central Asia, *Syr Darya* and *Amu Darya*, originate in Kyrgyzstan fed by the meltwater of the glaciers and snowfields of Tien Shan and Pamir as well as other smaller streams and rivers. *Syr Darya* flows from Kyrgyzstan through Uzbekistan to Kazakhstan and finally into the Aral Sea. The *Amu Darya* River flows from Kyrgyzstan to Tajikistan, then along the border of Uzbekistan and Turkmenistan, through Uzbekistan and finally into the Aral Sea (*Hays, Land, Geography and Weather of Kyrgyzstan*).

The largest rivers of Kyrgyzstan are Naryn, Talas, Chui, Kara Darya, Chatkal and Kyzyl Suu.

Naryn is the largest river in Kyrgyzstan and the main branch of the Syr Darya River in Central Asia. Its length is 535 kilometers. It is formed in eastern Kyrgyzstan by the Big and Little Naryn Rivers above Naryn city, then flows until Toktogul Reservoir, through the Fergana Range into the Fergana Valley and after merging with Kara Darya into the Syr Darya River. It plays an important role in the generation of hydroelectric power in Kyrgyzstan as well as the irrigation of agricultural fields of the Fergana Valley. The largest Toktogul Hydroelectric Station is located on the Naryn River.

Another important river in Kyrgyzstan is the *Talas River*. The Talas River is 294 kilometers long. The Talas River is the largest river in the Talas Valley. This river became famous after the famous Talas Battle between the Arab and Chinese armies in 751 in which the Chinese army was defeated by Arabs thanks to Karluk tribes that lived on the territory of Northern Kyrgyzstan.

The *Chui River* flows in Northern Kyrgyzstan from Naryn oblast through the Chui Valley into the deserts of Kazakhstan. Being the largest river in the Chui Valley, it intensively irrigates its agricultural fields. The river is passing by the capital Bishkek city (*Rivers*).

Table 1.1. Rivers of Kyrgyzstan

River	Length, km	Basin, thousand sq. km
Naryn	616	50.1
Talas	294	10.8
Chui	221	22.8
Kara Darya	189	16.2
Sary Jaz	165	12.1
Chatkal	155	6.9
Kyzyl Suu	128	7.8

Source: Rivers. <https://www.kyrgyzjer.com/en/category/kg/section29/section266/>. Accessed 24 April 2020.

77% of the rivers in Kyrgyzstan including the Naryn River belong to the Syr Darya and the Aral Sea basin. 13% including the Saryjaz, Ak Shyrak, Inylchek Rivers flow into the Tarim River basin in Western China. And 11% of all rivers belong to the Issyk-Kul Lake basin in Kyrgyzstan (Kulmatov 28).

1.6. Lakes

Kyrgyzstan has about 2 000 lakes with the total surface area of 7 000 square kilometers located at the altitude of 3 000 to 4 000 meters. The largest lakes are Issyk-Kul, Son-Kul and Chatyr-Kul.

The largest lake in Kyrgyzstan is the *Issyk-Kul Lake*. Located between the Tien Shan mountain ranges at the altitude of 1 600 meters, it covers the area of 6 236 square kilometers (*Kyrgyzstan Lakes*).

Issyk-Kul is one of the largest lakes in the world, the second highest lake in the world after Titicaca in Peru and Bolivia, the fourth deepest lake in the world (700 meters deep at its deepest point), and the second largest lake in Central Asia after the Ara Sea. It is 180 kilometers long from the east to the west and about 70 kilometers wide from the north to the south. Issyk-Kul means *Hot Lake* in the Kyrgyz language because its water does not freeze in winter. The reasons could be hot thermal springs that feed the lake, its depth and low salinity (*Hays, Land, Geography and Weather of Kyrgyzstan*).

Son-Kul is the second largest lake in Kyrgyzstan. It is located at the altitude of 3 000 meters above the sea level. Its surface area occupies 270 square kilometers. Unlike Issyk-Kul, Son-Kul freezes in winter and remains frozen from September to June. Since it is located at a very high altitude, it is impossible to reach it in winter.

Chatyr-Kul is the third largest lake in Kyrgyzstan. It is located in the Ak-Sai Valley at the altitude of 3 500 meters above the sea level close to the Chinese border. Its surface area is 153 square kilometers. It is 16.5 meters deep. The lake is the resting place for many wild birds.

One of the most unique lakes in Kyrgyzstan is *Merzbacher Lake*. It is located at the altitude of 3 300 meters above the sea level between the northern and southern branches of the Inylchek Glacier that feeds it. The Merzbacher Lake forms every summer and then half empties in August flowing into the Inylchek River. While the lower part of the lake empties, the upper part stays always full of water (*Kyrgyzstan Lakes*).

Table 1.2. Lakes of Kyrgyzstan

Lake	Surface area, sq. km	Volume, million cubic meters	Altitude, meters
Issyk-Kul	6 236	1 738 000	1 606
Son-Kul	270	2 640	3 013
Chatyr-Kul	153.5	610	3 530
Sary-Chelek	4.9	483	1 873
Kel-Suu	4.5	338	3 514
Kara-Suu	4.2	223	2 022
Merzbacher	4.5	129	3 304
Kulun	3.3	118	2 856
Ai-Kul	1.0	57	2 937
Kara Toko	1.1	49	2 876

Source: Kyrgyzstan Lakes. <https://www.advantour.com/kyrgyzstan/nature/lakes.htm>. Accessed 25 April 2020.

1.7. Glaciers

At the highest altitudes, snow does not melt because of low temperatures. When a lot of snow falls, it compresses the previous layers of snow on the ground and create ice sheets. Ice sheets become higher and bigger forming glaciers.

There are more than 8 000 glaciers in Kyrgyzstan that contain 580 billion cubic meters of water and cover about 8 100 square kilometers, or 30% of the total area in Kyrgyzstan. The most famous is the *Inylchek Glacier* divided into two: *Southern Inylchek* and *Northern Inylchek* next to Pobeda and Khan Tengri Mountains in the eastern Tien Shan Mountains of Kyrgyzstan (*Glaciers of Kyrgyzstan*).

Glaciers of Kyrgyzstan are not only a characteristic of alpine landscape. There are also reservoirs of fresh water. Glaciers play a regulatory role in the process of river formation in Kyrgyzstan. The snow and ice concentrated in them are released during spring and summer. The role of glaciers can grow particularly during the years of insufficient moisture providing water to lower valleys and plains (Kulenbekov and Orunbaev).

Table 1.3. Glaciers of Kyrgyzstan

Glacier	Location	River	Length, km	Area, sq. km	Altitude
Southern Inylchek	Pobeda/Khan Tengri	Inylchek	60.5	632.3	2 980
Northern Inylchek	Pobeda/Khan Tengri	Mezebacher Lake	32.8	215.2	3 400
Kayingdi	Pobeda/Khan Tengri	Kayingdi	29.0	97.2	3 400
Korjinevskovo	Zapaiski Ridge	Djanai Dartak	21.5	99.4	3 890
Mushketov	Pobeda/Khan Tengri	Arir Ter	20.5	71.3	3 440
Semyenov	Pobeda/Khan Tengri	Sary-Jaz	20.2	64.5	3 340
Lenin	Lenin	Achik-Tash	13.5	58.1	3 760
Mushketov	Kakshaal	Kotur	13.3	23.0	3 940
Nalivkin	Kakshaal	Ai-Tala	13.2	19.5	3 960

Glacier	Location	River	Length, km	Area, sq. km	Altitude
Keikal	Pobeda/Khan Tengri	Terekti	12.9	26.8	3 380
Petrov	Ak Sheirak	—	14.3	73.9	—

Source: Glaciers of Kyrgyzstan. <https://www.advantour.com/kyrgyzstan/nature/glaciers.htm>. Accessed 25 April 2020.

1.8. Natural resources

Kyrgyzstan is not so rich in natural resources compared to its neighbors or other Central Asian states as Kazakhstan, Uzbekistan and Turkmenistan. Nevertheless, Kyrgyzstan has deposits of coal, iron ore, non-ferrous metals.

The reserves of coal in Kyrgyzstan are estimated as 28 billion tons with 2 billion tons already explored. Most of coal deposits are located in the mountains, and therefore difficult to exploit. Coal deposits can be found in the Fergana Valley, Naryn and Issyk-Kul regions. The most famous coal mines are *Kyzyl-Kiya*, *Sulyukta*, *Tash-Kumyr* (Kulmatov 18).

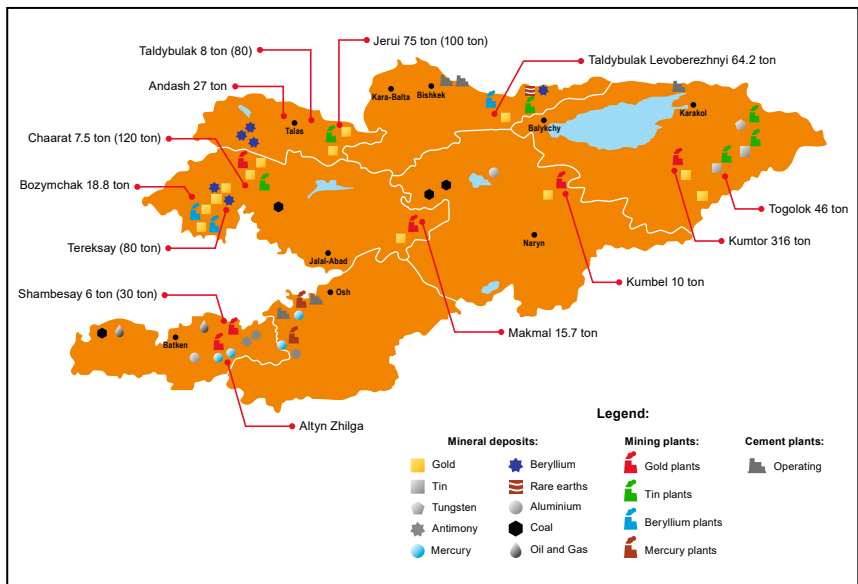
The reserves of iron ore in Kyrgyzstan are estimated at 5 billion tons and contain about 30% of iron (Jeffrey Hays, *Resources in Kyrgyzstan*). The largest deposit is Jetim with 1.7 billion tons of iron ore that contain 35% of iron. Smaller reserves of iron ore can be found near Talas city (Kulmatov 20).

Kyrgyzstan also has copper, lead, zinc, molybdenum, mercury, antimony, tin, uranium, tungsten, platinum, titanium, vanadium, aluminum, strontium, beryllium, tantalum, silver, bismuth, arsenic, cobalt, some traced elements, colored stones, graphite deposits and a lot of non-metallic minerals. Copper deposits are located very high in the mountains that makes its extraction very costly. Kyrgyzstan used to be one of the main suppliers of mercury, antimony and uranium to the Soviet market as well as international markets. However, with the collapse of the Soviet Union, mercury and antimony are not any more exported. The extraction of

uranium completely stopped after independence. Kyrgyzstan has small oil and gas reserves that are located primarily in southern Kyrgyzstan (Hays, *Resources in Kyrgyzstan*).

The most valued mineral in Kyrgyzstan is gold. The country has substantial reserves of gold that are extracted by local and foreign gold mining companies. The biggest company is *Kumtor Gold Company* from Canada that extracts gold on the southern shore of the Issyk-Kul Lake. Kumtor is one of the leaders of gold mining in the world. There are other big gold companies in Kyrgyzstan such as *Jerui* in Talas region and *Taldy-Bulak* in Kemin region.

Figure 1.2. Active mineral deposits of Kyrgyzstan



Source: Agency of Geology under the Government of the Kyrgyz Republic.

Kyrgyzstan has substantial reserves of construction materials such as sand, limestone, marble, granite, clay. Among them are precious and decorative stones: topaz, aquamarine, jade, amethyst, chalcedony, agate.

Kyrgyzstan has about 100 deposits of mineral water, 30 deposits of acidulous water, more than 50 springs of warm and hot mineral water. A number of recreational facilities and resorts have been built on those deposits: *Jalal-Abad Resort*, *Issyk-Ata Resort*, *Ak-Suu Resort*, *Jergalan Resort* and others. The water collected from those deposits is bottled and sold in local supermarkets (*Underground fresh and mineral water*).

2

TOPIC

FLORA AND FAUNA

2.1. Climate

The climate of Kyrgyzstan is predominantly continental because the country is very far from the world oceans. There are many sunny days in Kyrgyzstan: 2 500—2 700 hours of sun a year. Therefore, sun radiation serves a main characteristic of climate formation in Kyrgyzstan. However, depending on an altitude, the climate can vary from very continental in the mountains to more subtropical in the valleys. There are also local climatic variations between the regions that result in climatic zoning (Kulmatov 23).

Five climatic zones can be distinguished in Kyrgyzstan. The main markers of a climatic zone are altitude and average summer temperature.

The first climatic zone is the zone with hot and long summer that lasts from May to September and takes place at the altitude of 1000 meters and lower in the Chui, Talas and Fergana Valleys where the average July temperature is from +23 °C to +28 °C.

The second climatic zone is the zone with a moderate hot summer that lasts 4—4.5 months and is found in the upper areas of the Chui, Talas and other valleys at the altitude of 1 000—1 500 meters with the average July temperature from +19 °C to +23 °C.

The third zone is the zone with a warm summer that lasts 3.5—4 months, for example Issyk-Kul basin, found at the altitude of 1 500—2 000 meters with the average summer temperature of +16 °C up to +19 °C.

The fourth zone is the zone with a moderate warm climate in summer that lasts 3—3.5 months and takes place at the altitude

of 2 000—2 400 meters with the average July temperature of +13 °C up to +16 °C.

And the fifth zone is the zone with a cold summer that can be found at the altitude of 2 500 meters and higher (Kulmatov 24—25).

In winter, the temperature depends not on an altitude but more on a particular landscape. Low temperatures can be observed in closed hollows of the Inner Tien Shan Mountains and high mountainous valleys. It happens because cold air gets stuck between the mountains when it goes down the slope. Mountains also collect clouds and block sunlight. Therefore, the coldest average January temperatures of -10 °C and lower are observed in the mountains. In the valleys, at the altitude of 1 000 meters and lower, the average winter temperature is from -3 °C to -7 °C. Although the Issyk-Kul region is located at a higher altitude, it has the warmest winter in Kyrgyzstan with the average January temperature of -2 °C. This warm winter is caused by the lake that creates a mild and humid microclimate around it in the region (Kulmatov 26).

In Kyrgyzstan, all four seasons can be observed: winter, spring, summer and fall. In general, summers are hot and winters are cold. Compared to summers and winters, springs and falls are warm and short. Springs are early, while falls can be cold and rainy in November. Winters are not very snowy. In the valleys, snow falls from late November through March and then melts quickly. In the mountains, the snow season starts earlier in September—October depending on an altitude and ends later in April—May, so that the snow can stay long enough.

The rainfall is different in different regions of Kyrgyzstan. It varies from 110 mm a year near Balykchy city to 1 100 mm a year on the western slope of the Fergana Range. The mountains receive more than 1 000 mm of rainfall a year, while the valleys receive much less: the Chui and Talas Valleys receive from 250 to 400 mm of rainfall a year, the Fergana Valley from 200 to 400 mm, the valleys of Inner and Central Tien Shan from 200 to 300 mm. Most of rainfall is received in springs and falls (Kulmatov 26—27).

2.2. Soils

The soils of Kyrgyzstan are diverse and depend on many factors: landscape, climate, altitude and others. According to landscape, soils in Kyrgyzstan can be divided into two main groups: the soils of valleys and the soils of mountains.

Altitude plays the key role in the formation of different soils, especially in the mountains of Kyrgyzstan. In the lowest valleys of Kyrgyzstan at the altitude of 1 000—1 200 meters, gray soils are formed, while chestnut soils are predominant at the altitude of 1 500—1 600 meters. At the altitude of 1 500—2 000 meters, in the meadow steppes, there are brown and chernozem soils. However, the most fertile and rich in humus are black and brown soils that can be found in the southwest of Fergana Range under the walnut and nut forests at the altitude of 1 300—2 200 meters. There are dark colored, dark brown and rocky soils found under spruce and juniper forests in the mountains at the altitude of 1 800—2 000 and 2 700—3 000 meters. Finally, in subalpine and alpine meadows and steppes at the altitude of 3 500—3 800 meters, there are meadow and meadow-steppe soils (Kulmatov 37—38).

In the valleys of Kyrgyzstan, for example, the Chui, Talas and Fergana Valleys, that are located at the altitude of 1 000—1 100 meters, gray soils rich in carbonates and poor in humus predominate. If these soils are irrigated well, they are pretty fertile to grow industrial crops (sugar bit, tobacco), grape, vegetables.

Chestnut soils are located at the altitude of 1 000—1 700 meters. Such soils can be found in the eastern parts of Chui and Talas Valleys and the Issyk-Kul Lake basin. These soils develop in those areas where the climate is not very hot. These soils contain less carbonates and more humus, and therefore, can be used to grow crops, vegetables, and to do gardening.

Gray brown and light brown soils form at the altitude of 1 500—2 300 meters in dry warm climate with maximum rainfall, for example, on the western part of the Issyk-Kul Lake basin as well as the regions of Inner Tien Shan. They contain carbonates

and do not have enough humus, so they are good to cultivate wheat, barley, potato, some vegetables, feed crops as well as to do gardening if irrigated well.

Dark chestnut and chernozem soils occupy relatively a small area of Kyrgyzstan. They can be observed at the altitude of 1 500—2 000 meters above the sea level in the mountainous Chui and Fergana Valleys, the eastern part of the Issyk-Kul Lake basin. They are rich in humus and highly fertile but subject to erosion, salination and waterlogging.

Chestnut sod soils located in high mountainous valleys are not used in agriculture because of cold climate. They are partially used to cultivate feed crops. Most of them are used as pasture lands (Kulmatov 35—37).

2.3. Geographical zones

Based on landscape, climate and other natural factors, the territory of Kyrgyzstan can be divided into seven geographical zones (Kulmatov 51—63).

The first geographical zone is Northern Kyrgyzstan. It includes the Chui, Talas and Kemin Valleys surrounded by mountain ranges. It is characterized by dry hot summers and moderate winters. The typical soils for this zone are gray soils. The zone is dominated by semideserts, steppes, meadows combined with forests, followed by subalpine and alpine meadows, and finally by snow and glaciers at higher altitudes.

The second geographical zone is the Issyk-Kul Lake basin in the northeast of Kyrgyzstan. It is marked by very dry climate in the west and humid climate in the east. The typical soils are chestnut and brown soils. Deserts and semideserts predominate in the west, while the eastern part of the zone represents the combination of meadows, steppes and forests, followed by snow and glaciers on the tops of the mountains.

The third geographical zone is Inner Tien Shan. It is a mountainous area limited by Northern and Middle Tien Shan Mountains in Naryn oblast. The climate is dry and cold. The typical soils

are brown soils. The zone is represented by semideserts, steppes and meadows.

The fourth geographical zone is Central Tien Shan. It is occupied by the highest mountains of Kyrgyzstan with Pobeda Mountain of 7 439 meters and Khan Tengri Mountain of 7 010 meters. The climate is very dry and cold. It is the highest and coldest zone in Kyrgyzstan with 20% of its territory covered by glaciers. The typical soils are brown, steppe and meadow soils. The zone is characterized by semideserts, steppes, meadows, followed by subalpine and alpine meadows, and finally the permafrost belt at the altitude of 3 000 meters and higher.

The fifth geographical zone is Southwestern Tien Shan that occupy the northern and eastern parts of the Fergana Valley. It is characterized by subtropical climate: dry hot summers and warm winters. The typical soils are brown and chernozem soils. The zone is represented by semideserts, steppes, meadows and by subalpine and alpine meadows at higher altitudes. A unique feature of the zone is walnut and nut forests.

The sixth geographical zone is Alai-Turkestan. It occupies the southern Fergana Valley with Alai and Turkestan Ranges. It has the driest climate in the Fergana Valley. The typical soils are light brown and brown soils. The zone is represented by deserts and semideserts, steppes, meadows, followed by subalpine and alpine meadows, and finally snow and glaciers on the tops of the mountains.

The seventh geographical zone is the Alai Valley between the Alai and Chon Alai Ranges. It has dry continental climate with cold summers and cold winters. The typical soils are light brown and dark brown soils. The zone is occupied by semideserts, steppes, meadows, subalpine and alpine meadows combined with rocks and small forests.

2.4. Flora

Kyrgyzstan has highly diverse flora. Depending on an altitude, various plants, bushes and trees can be found. The flora in Kyrgyzstan is represented by the species of Near Asia (*walnut, juniper*)

in southern Kyrgyzstan, the species of Siberia (*spruce, birch*) in northern Kyrgyzstan and the Issyk-Kul Lake basin, and the species of Central Asia in Inner and Central Tien Shan (*cobresia, aconite*).

At the altitude of 1 000—1 200 meters, in the Chui, Fergana and Talas Valleys, desert and semidesert flora predominates. During humid warm springs, plants grow and bloom but burn out very soon when dry hot summers come.

The western part of the Issyk-Kul Lake basin as well as Inner Tien Shan valleys at the altitude of 1 500—2 200 meters are occupied by mountainous desert flora. Some areas are completely bare. Even less vegetation can be found in high deserts and semideserts of Central Tien Shan at the altitude of 3 000—3 500 meters. Vegetation there does not cover more than 10—15% of the area because of cold climate and the lack of rainfall.

Steppes has much richer flora compared to deserts and semideserts thanks to more rainfall. Steppes occupy most of the territory in Kyrgyzstan: northern Kyrgyzstan, Inner and Central Tien Shan, the Talas, Kemin, Fergana, Alai Valleys, and the Issyk-Kul Lake basin. At higher altitudes, the flora becomes more diverse, steppe plants are combined with meadow plants.

At the altitude of 1 600—2 500 meters, steppe flora is replaced by meadow flora. Meadow flora predominates up to the level of subalpine meadows at the altitude of 3 000—3 300 meters. At the altitude of 3 600—3 800 meters, subalpine meadow plants are replaced by alpine meadow plants.

Forests occupy 3.5% of the territory in Kyrgyzstan. There are spruce, juniper, fir, walnut, nut, birch and poplar forests in Kyrgyzstan. The most unique walnut forest is Arslanbob that is located in southern Kyrgyzstan at the altitude of 1 400—2 200 meters (Kulmatov 39—47).

Kyrgyzstan has 200 species of officinal plants. Officinal plants such as *St. John's wort, coltsfoot, sea buckthorn, Turkestan thermopsis, origanum, horsetail* can be used in medicine and pharmacy. Some plants have economic importance for Kyrgyzstan such as *saltwort, barberry, rhubarb, thyme*. The most beautiful *tulip* and

edelweiss also grow in the mountains of Kyrgyzstan (*Flora and Fauna of Kyrgyzstan*).

The endangered species of plants are included in the Red Book, or Red List, of Kyrgyzstan. According to the 1985 list, 65 species of plants in Kyrgyzstan are threatened with extinction. Therefore, they are under the legal protection of the state. In order to protect them, a number of nature reserves and national parks have been created (*The Red Book of Kyrgyzstan*).

2.5. Fauna

The fauna of Kyrgyzstan is represented by different animals, birds and insects. The animals can be classified according to the altitude belts they occupy.

The deserts and semideserts of the Chui, Talas and Fergana Valleys are inhabited by the animals that can be also found in Uzbekistan: snakes, tortoise, lizard and others. Their number is not very high and the composition is not so diverse.

The fauna of steppes varies more in terms of its number and composition compared to the fauna of deserts and semideserts. Steppe animals include the species of amphibians, reptiles, mammals, birds, insects.

Forests and meadows are inhabited by many other animals. Some forests and meadows have unique animals that cannot be found in other areas. Forest animals are bore, deer, various species of birds, while meadow animals are wolf, bear, fox and others.

In high subalpine and alpine meadows, the most unique animals such as *mountain goat*, *snow leopard*, *red wolf*, *Tien Shan bear*, *Pallas's cat* can be found. Most of those animals have been included in the Red Book, or the Red List, of Kyrgyzstan, and are protected by the law. Hunting those animals is illegal (Kulmatov 47—49).

At higher altitudes, less animals but more birds can be observed. Among them are *red-bellied redstar*, *alpine chought*, *rock pigeon*, *partridge* and *bullfinch*. Predatory birds such as *eagle*, *falcon*, *hawk* are also common in the mountains. Predators can

be used by people in hunting if properly trained by them (*Flora and Fauna of Kyrgyzstan*).

The lakes and rivers of Kyrgyzstan have their water birds, fish, amphibians. The largest Issyk-Kul Lake in Kyrgyzstan is famous for its *seagull, duck, swan, flamingo*.

The 1985 Red Book, or Red List, of Kyrgyzstan included 92 endangered species of animals: insects, fish, reptiles, birds and mammals. To protect them, they have been placed in special nature reserves and national parks by the state. Among them are *maral, Mensbir marmot, arkhar, Marco polo sheep* and many others (*The Red Book of Kyrgyzstan*).

2.6. National parks and nature reserves

National parks, nature reserves and other protected areas of Kyrgyzstan cover almost 1.5 million hectares and comprise about 7% of the country's territory. There are 10 nature reserves, 13 national parks, 19 natural monuments and 45 management areas that include botanical gardens, forests and zoological reserves. They have been created to protect the endangered and unique ecosystems of Kyrgyzstan with their landscape, flora, fauna and sometimes the monuments of historical importance. The most famous among them are Ala-Archa National Park, Besh-Aral State Nature Reserve, Besh-Tash State Nature National Park, Issyk-Kul Biosphere Reserve and others (*National Parks of Kyrgyzstan*). While national parks are managed by the state or government and can be visited by tourists, nature reserves are not usually allowed to the public and their role is to preserve the area.

Ala-Archa National Park is a favorite tourist site. It was founded in 1974 to protect the Ala-Archa River and its surrounding area. The park includes famous *Komsomolets* and *Semenov-Tyanshanskiy* Mountains as well as glaciers, a hotel and a climbers' cemetery.

Besh-Aral State Nature Reserve is located in Jalal-Abad oblast on the border with Uzbekistan. It was established in 1979 to preserve the natural forests of the Chatkal Range as well as the

unique animal Mensbir marmot and flowers as *Grieg* and *Kauffman tulip*.

Besh-Tash State Nature National Park aims to protect the Besh-Tash River and Besh-Tash Lake with their unique and beautiful forests. The park was created in 1996.

The entire Issyk-Kul oblast was announced *Issyk-Kul Biosphere Reserve*. In 2000, it became part of the UNESCO World Network of Biospheres. The reserve occupies 43 100 square kilometers, or about 22% of Kyrgyzstan's total territory. It is home for many endangered animals included in the Red Book such as Marco Polo sheep, Siberian ibex, snow leopard, Tien Shan bear. The reserve covers a number of ecosystems from deserts to mountains.

Saimaluu-Tash State Nature National Park established in 2001 in the eastern part of Jalal-Abad oblast is also a historical monument famous for its rock art petroglyphs dated as early as the Bronze Age and later.

Jeti-Oguz is a nature monument 25 kilometers from Karakol city. It was named Jeti-Oguz, or "seven bulls" in the Kyrgyz language, because of the rocks that look like seven bulls (*National Parks of Kyrgyzstan*).

3

TOPIC

POPULATION

3.1. Background

The population of Kyrgyzstan reached 6 500 000 people in 2020. Since the year of 1991 when Kyrgyzstan became independent, the population increased by 2 million people. The annual growth rate in Kyrgyzstan is stable for almost 30 years of independence, and comprise above 1% per year that is very close to the worldwide trends (*Kyrgyzstan Population 2020*).

There are two factors that contribute to the population growth after independence: birth rate and emigration. Although the birth rate in the country is more than the average birth rate in the world, or about 3 children born to the average woman in Kyrgyzstan, substantial emigration from the republic balance this out to create the moderate growth rate in the republic (*Kyrgyzstan Population 2020*).

The population in Kyrgyzstan has changed rapidly since the 1950s. In the 1950s, the population of Kyrgyzstan was about 2 million people, in 1970s, more than 3 million people, and in the 1980s, more that 4 million people. In 2003, the population of Kyrgyzstan turned 5 million people, and in 2016, 6 million people.

As for the projections, it is expected that the annual growth rate in Kyrgyzstan will slow down after 2020 and start declining. The calculations made state that the population in Kyrgyzstan will be 6 997 284 in 2030, 7 596 178 in 2040, and 8 112 653 by 2050 (*Kyrgyzstan Population 2020*).

3.2. Current demographics

The population of Kyrgyzstan is young. The people under 15 years old comprise 29% (1 873 523 people), between 15 and 64 years old is 65% (4 187 397 people), and above 64 years old — 5% (338 598 people). This population age distribution is typical for developing countries in the world and result from such factors as high birth and mortality rates. Moreover, short life expectancy, poor health care system and low level of education in Kyrgyzstan contribute to such a distribution of people by age.

Table 3.1. Cities of Kyrgyzstan

City	Population, people
Bishkek	1 000 000
Osh	300 000
Jalal-Abad	111 135
Karakol	78 130
Tokmok	66 283
Uzgen	61 582
Balykchy	49 655
Kara-Balta	47 655
Kyzyl-Kiya	41 525
Naryn	40 767
Talas	39 547

Source: Kyrgyzstan. <https://www.citypopulation.de/en/kyrgyzstan>. Accessed 1 May 2020.

By sex, the population of Kyrgyzstan consists of 3 174 128 males (49.3%) and 3 260 968 (50.7%) females. In the age group under 15 years old, there are 955 256 males and 918 267 females,

between 15 and 64 years old, 2 050 790 males and 2 136 671 females, and above 64 years old, 130 806 males and 207 792 females (*Kyrgyzstan Population*). As the figures above show, initially more males are born in Kyrgyzstan but not all of them reach older age. Males in Kyrgyzstan die earlier compared to females due to various social factors.

Life expectancy is one of the most important demographic indicators. The average life expectancy in Kyrgyzstan is 70 years old. While the average male lives 66 years, the average female in Kyrgyzstan lives about 74 years. This is below the average life expectancy in the developed countries of the world (*Kyrgyzstan Population*). For example, the average life expectancy in Japan is 84 years, in Italy is 83 years, in USA is 78 years.

Most of the population in Kyrgyzstan lives in rural areas, and only 35.6% (2 322 557 people) live in cities and their surrounding metropolitan areas (*Kyrgyzstan Population 2020*). The largest city and the capital of Kyrgyzstan is Bishkek city with the population of 1 000 000 people. The second largest city is Osh city in the southern part of the country with the population of 300 000 people (*Kyrgyzstan*).

The literacy rate in Kyrgyzstan is 99.5% of adult population aged 15 or older, or 4 504 345 people. The literacy rate among males is slightly higher 99.6% (2 173 808 people) than the literacy rate among females — 99.4% (2 330 537 people). Among the young people aged 15—24, the literacy rate is 99.75%: 99.7% among young males and 99.8% among young females (*Kyrgyzstan Population*).

3.3. Oblasts

There are seven oblasts (administrative regions) in Kyrgyzstan: *Chui, Issyk-Kul, Naryn, Talas, Jalal-Abad, Osh* and *Batken* oblasts. Four oblasts are located in the northern part of Kyrgyzstan: Chui, Issyk-Kul, Naryn, Talas oblasts, while three oblasts are located in the south: Jalal-Abad, Osh and Batken oblasts. About 3 million people of Kyrgyzstan live in the north, while the remaining 3.5 million people live in the south.

Figure 3.1. Oblasts of Kyrgyzstan



Source: About Kyrgyzstan. <https://jannat-travel.com/about-kyrgyzstan>. Accessed 15 November 2020.

The population of the country is distributed unequally among its oblasts. The highest population is in Osh (1 368 054 people) and Jalal-Abad oblasts (1 238 750 people). They are followed by Bishkek city (1 053 915 people), Chui oblast (959 884 people), Batken oblast (537 365 people), Issyk-Kul oblast (496 050 people), Osh city (312 530 people), Naryn oblast (289 621 people) and Talas oblast (267 360 people) (*Kyrgyzstan*).

High population is caused by higher annual natural growth in southern oblasts: 2 157 people in Osh oblast and in 2 166 people in Jalal-Abad oblast in 2020 compared to 1 788 people in Bishkek city, 1 199 people in Chui oblast, and 1 039 people in Osh city in 2020 (*National Statistical Committee of the Kyrgyz Republic*).

The average population density in Kyrgyzstan is 32 people per square kilometer. At the same time, the highest population density was recorded in Chui (about 48 people per square kilometer), then in Osh (46 people per square kilometer) oblasts, followed by Jalal-Abad oblast (37 people per square kilometer).

At the same time, more than 85% of the population live in the Chui, Talas and Fergana Valleys that are located at the altitude of less than 1 500 meters and represent about 15% of the total

area in Kyrgyzstan. 13% of the population live at the altitude of 1 500—2 000 meters. And the remaining 2% live at the altitude of 2 000 meters and higher (Kulmatov 66).

Table 3.2. Oblasts of Kyrgyzstan

Oblast	Area, sq. km	Population, people
Bishkek city	127	1 053 915
Chui oblast	20 189	959 884
Issyk-Kul oblast	43 144	496 050
Naryn oblast	45 202	289 621
Talas oblast	11,446	267 360
Jalal-Abad oblast	33 648	1 238 750
Osh city	50	312 530
Osh oblast	29 139	1 368 054
Batken oblast	17 000	537 365
Kyrgyzstan	199 945	6 523 529

Source: Kyrgyzstan. <https://www.citypopulation.de/en/kyrgyzstan>. Accessed 1 May 2020.

3.4. Ethnicities, languages, religions

There are more than 80 ethnicities in Kyrgyzstan. As per the data of 2019, the largest ethnic group was Kyrgyz who made up 73.5% of the population, or 4 695 646 people. They were followed by Uzbeks (14.7%, or 940 628 people) and Russians (5.5%, or 348 935 people). All other ethnicities were 6% of the population. Among them, there were Dungans, Uighurs, Tajiks, Turks, Kazakhs, Tatars, Koreans and others (*Natsional'nyi statisticheskiy komitet Kyrgyzskoy Respubliki*).

The proportion of Kyrgyz in Kyrgyzstan increased from 50% in 1979 to more than 70% in 2019, while the proportion of

Russians dropped from 25.9% in 1979 to 5.5% in 2019. In 1989, the percentage of Germans in Kyrgyzstan was 2.9%, or more than 100 000 people, while in 2019 it dropped to 0.1%, or 8 000 people (*Osnovnye itogi pervoi natsional'noi perepisi naseleniia Kyrgyzskoi Respubliki 1999 goda*).

Table 3.3. Ethnicities of Kyrgyzstan

Ethnicity	Population, people	Population, %
Kyrgyz	4 695 646	73.5
Uzbeks	940 628	14.7
Russians	348 935	5.5
Dungans	72 240	1.1
Uighurs	58 168	0.9
Tajiks	56 219	0.9
Turks	44 112	0.7
Kazakhs	36 022	0.6
Tatars	26 992	0.4
Azerbaijanis	20 771	0.4
Koreans	17 105	0.3
Ukrainians	10 600	0.2
Germans	8 201	0.1

Source: Natsional'nyi statisticheskiy komitet Kyrgyzskoy Respubliki. <http://www.stat.kg/ru/statistics/naselenie>. Accessed 1 May 2020.

In terms of oblasts, Kyrgyz represents the majority population in all oblasts of Kyrgyzstan, especially in Naryn and Talas oblasts. Russians predominantly reside in the northern Chui and Issyk-Kul oblasts and Bishkek city, while Uzbeks mainly occupy the southern Osh and Jalal-Abad oblasts and Osh city.

The most widely practiced religion in Kyrgyzstan is Islam. There are 90% Muslims in Kyrgyzstan, 5% Orthodox Christians, and 5% of those practicing Buddhism, Judaism, Bahaism and other religions or being atheists. At the same time, among those who attributed themselves to Muslims, 29% are practicing Muslims, or people who pray five times a day and follow other religious duties.

There are three widely spoken languages in Kyrgyzstan: Kyrgyz, Russian and Uzbek. The Kyrgyz and Russian languages have the official status according to the Constitution of the Kyrgyz Republic: Kyrgyz was declared the state language, while Russian became the official language of Kyrgyzstan. Moreover, there are other languages spoken in intra-ethnic and family communication in the republic such as Tajik, Dungan, Uighur, Turkish.

3.5. Migration

Migration is the most remarkable phenomenon of recent years. Migration has appeared as a result of various political and socio-economic problems that Kyrgyzstan has faced in the Soviet period and after independence: the economic crisis, unemployment, poverty, political instability.

Different types of migration can be observed in Kyrgyzstan such as immigration, emigration, internal migration, external migration, labor migration. Each type of migration has played an especial role in different periods of the history.

If *immigration* characterized the arrival of other ethnicities in Kyrgyzstan during the early Soviet time, since the 1970s, the main trend became *emigration*, or the departure of non-indigenous people from Kyrgyzstan, that began predominating. The 1979 census of Kyrgyzstan marked the highest populations of Russians (25.9%), Ukrainians (3.1%), Germans (2.9%) and Tatars (2%) in the republic, however, since then they turned to decline (*Osnovnye itogi pervoi natsional'noi perepisi naseleniia Kyrgyzskoi Respubliki 1999 goda* 26).

In the 1980—1990s, right before and after independence, emigration dramatically increased and marked a large-scale exodus

of non-indigenous ethnic groups from Kyrgyzstan towards the countries of their ethnic origin: Russia, Kazakhstan, Israel, Germany, South Korea. Therefore, the proportions of Russians in Kyrgyzstan sharply decreased to 21.5%, Ukrainians to 2.5%, Germans to 2.4% and Tatars to 1.6% in 1989 (*First National Population Census* 26).

On the other hand, it was the *internal migration* of Kyrgyz who decided to move from their villages to cities to seek an employment or enter higher educational institutions. Historically Kyrgyz lived in rural areas where they were engaged in traditional cattle-breeding or cultivation of crops. That is, in the 1950s, Kyrgyz made up 13.3% among urban residents in the republic and 10.4% in Bishkek city (*Naselenie Kyrgyzstana: itogi pervoi natsional'noi perepisi naseleniia Kyrgyzskoi Respubliki 1999 goda v tablitsakh* 81). However, with industrialization and the opening of higher educational institutions, they moved to urban centers.

After independence, the socio-economic situation changed significantly. The economic crisis and unemployment forced many Kyrgyz to leave Kyrgyzstan to be employed in Russia, Kazakhstan and other countries of the near and far abroad. The phenomenon was named *Kyrgyz labor migration*. By some estimations, about one million labor migrants of Kyrgyz origin recently work abroad.

Moreover, after independence the Kyrgyz people started moving more actively inside Kyrgyzstan: from villages to cities, from smaller towns to larger cities, from mountainous areas to valleys, from southern to northern oblasts, from all oblasts to Chui oblast and Bishkek city to get a better job, receive a higher education, or have a more comfortable place to live.

It has to be mentioned that Kyrgyz internal migrants and emigrants face a lot of problems in both Kyrgyzstan and abroad: the lack of housing, low salaries, an illegal status, the violation of their rights, discrimination, their families and children left behind.

4

TOPIC

ECONOMY

4.1. Background

Prior to independence in 1991, the economy of Kyrgyzstan was represented by state enterprises and collective farms monopolized by the state with command and control methods of management. The economy of Kyrgyzstan was characterized as an industrial-agricultural economy because industries contributed 57% to GDP of the country, while agriculture contributed only 22%. Out of 57%, 52% was produced by manufacturing industry. Along with manufacturing industry, other sectors such as machinery, mining, light industry, food industry, non-ferrous metallurgy, energy were considered as highly developed sectors in the economy of Kyrgyzstan. All industrial enterprises of Kyrgyzstan were built at the expense of the union budget that contributed 90% of their cost, and consequently continued to subsidize them by 8–14%. Large-scale agriculture of Kyrgyzstan was represented by animal husbandry, the cultivation of industrial and feed crops, the growing of vegetables, gardening, viticulture (Kulmatov 71–73).

The transition from a centralized planned economy to a market-oriented economy after independence was not so easy. The economic changes of the 1990s were accompanied by a deep economic crisis that was caused by the breakdown of economic ties between union republics, high dependence of Kyrgyzstan on the union market and subsidies as well as the import of natural resources (oil, natural gas, forest) and production (machinery, oil products, technologies) from other union republics. The economic reforms initiated by the government were not very successful.

In addition, the authorities miscalculated the negative consequences of denationalization, privatization and the agrarian reform.

As a result, local enterprises in Kyrgyzstan stopped operating, since they could not any more compete with cheaper goods imported from abroad. In 2000, 53 large industrial enterprises closed down. Those remained faced financial difficulties. Therefore, the economy of Kyrgyzstan became predominantly agricultural. The percentage of industries in GDP decreased to 21.5%, while the percentage of agriculture in GDP increased to 36.6% (Kulmatov 76—79).

4.2. Economic zones

By the level of industrial and agricultural development, Kyrgyzstan can be divided into two main economic zones: Northern Kyrgyzstan and Southern Kyrgyzstan. While Northern Kyrgyzstan is known for its manufacturing and processing industries predominating in the zone, Southern Kyrgyzstan is mainly specialized in mining and the development of hydropower resources.

Depending on economic sectors, five economic subzones can be distinguished on the territory of Kyrgyzstan: Northern Kyrgyzstan, Northern-Western Kyrgyzstan, Eastern Kyrgyzstan, Inner Kyrgyzstan and Southern Kyrgyzstan (Kulmatov 117—131).

The first economic subzone of Northern Kyrgyzstan geographically overlaps with Chui oblast. It is the most developed economic region with favorable soil and climatic conditions, highest urbanization and mainly urban population, railway and automobile roads, the industrial sectors such as machinery, metalworking, light and food industries, tanning and footwear industries, construction materials, non-ferrous metallurgy, agriculture.

The second economic subzone of Northern-Western Kyrgyzstan coincides with Talas oblast of Kyrgyzstan. It is primarily agricultural zone with favorable soil and climatic conditions to grow tobacco, sugar beet, beans, potato, crops, mainly rural population, few industries such as non-ferrous metallurgy (gold), construction materials, food and light industries.

The third economic subzone of Eastern Kyrgyzstan corresponds to Issyk-Kul oblast. The subzone has favorable climatic conditions, rich in minerals (coal, rare minerals), construction materials, thermal mineral water and therapeutic mud of the Issyk-Kul Lake resorts, non-ferrous metallurgy (Kumtor mine), food industry, cultivation of potato, crops, vegetables and fruits, the development of tourism.

The fourth economic subzone of Inner Kyrgyzstan overlaps with Naryn oblast. It is an agricultural zone with animal husbandry as the main economic sector and harsh climatic conditions, high altitude, the production of crops, forage crops and potato, construction materials, non-ferrous metals, hydropower resources.

The fifth economic subzone of Southern Kyrgyzstan includes three southern Jalal-Abad, Osh and Batken oblasts. It is an agricultural and industrial zone, with warm climate that favors the cultivation of vegetables, fruits, crops, cotton, tobacco, food and textile industries, walnut and nut forests, mining (coal, gas, oil), non-ferrous metallurgy, hydropower resources, construction materials, historical and archaeological sites that favor tourism.

4.3. Industry

In 2017, the industry of Kyrgyzstan contributed 44.4% to GDP growth (*Logistics and Transport Competitiveness in Kyrgyzstan* 5). The industry of Kyrgyzstan includes the following sectors: energy, non-ferrous metallurgy, machinery and metalworking, radio electronic industry, light industry, food industry, and the production of construction materials.

The energy sector of the republic is represented by coal, oil, natural gas and electricity production. The exploitation of energy resources in Kyrgyzstan is very low. One of the reasons is high cost of energy facilities needed to extract and produce energy. The other reason is the orientation of energy towards its import to neighboring countries. According to some estimations, the cost of energy sector is about 7 billion som. Therefore, with the economic crisis that broke out in the 1990s, the production of energy in Kyrgyzstan sharply declined. The extraction of coal

dropped by 11% in 1990s, oil by almost 50% and natural gas by 33% (Kulmatov 79).

At the same time, the basis of the energy sector in Kyrgyzstan is hydroelectric power and heating stations. There are five largest hydroelectric stations in Kyrgyzstan: *Toktogul* (1 200 MW), *Kurpsai* (800 MW), *Tash-Kumyr* (450 MW), *Shamaldysai* (240 MW), *Uchkurgan* (180 MW), the medium *Atbashi* (40 MW) and 13 small hydroelectric stations that altogether produce 42 MW. Besides, there are two heating stations in Kyrgyzstan: *Bishkek Heating Station* (609 MW) and *Osh Heating Station* (22 MW) that produce heating.

Kyrgyzstan exploits less than 10% of hydroelectric power resources, or 10% of what can be produced if more hydroelectric power stations, especially small-sized, are built on small rivers of Kyrgyzstan. The construction of new hydroelectric stations in the country would help produce enough energy and supply it to distant regions of Kyrgyzstan (Kulmatov 80—81).

The coal industry of Kyrgyzstan is still represented by old coal mines in *Kyzyl-Kiya*, *Sulyukta*, *Tash-Kumyr*, *Kok-Yangak* and some others. In the 1970s, the coal extracted there amounted to 4.5 million tons. Presently, it is half less. The sharp decline in the coal extraction has been resulted from the use of an old equipment in coal mining, the switch to cheaper and more comfortable electricity, and finally, very expensive transportation of coal. Moreover, the ecological impact of coal mining is not very good. To restore the coal industry, it is required to spend about one billion som (Kulmatov 81).

The deposits of oil and natural gas found in the Fergana Valley are very limited and not enough to meet the needs of Kyrgyzstan. There are some plans to increase the extraction of oil and natural gas 2.3—2.5 times using new technologies based on the agreements signed between Kyrgyzstan and Russia as well as to explore the new deposits of oil and natural gas in Kyrgyzstan. However, at present, the needs of the country in oil and natural gas can be only covered by the import from Russia, Kazakhstan, Uzbekistan.

Non-ferrous metallurgy is one of the leading industries in Kyrgyzstan. In 2000, non-ferrous metallurgy amounted to 93% of mining industry and about 44% of all industries in the country. The largest enterprises of non-ferrous metallurgy in Kyrgyzstan are *Kara-Balta Mining Combine* (gold, molybdenum, uranium), *Kadamjai Antimony Combine* (antimony), *Haidarkan Mercury Combine* (mercury), *Kyrgyz Chemical-Metallurgic Plant* (rare earth metals, oxides, silicon).

In 1990, *Kadamjai Antimony Combine* produced 5 400 tons of antimony, and occupied the third place in the world after China and Bolivia. In 1990, *Haidarkan Mercury Combine* produced 1 000 ton of mercury. However, after the collapse of the Soviet Union, the production of antimony, uranium, mercury, molybdenum, rare earth metals sharply decreased. Presently, most of those enterprises are invested by Russia, Kazakhstan, China (Kulmatov 82—84).

Gold mine is the most profitable non-ferrous metallurgy sector in Kyrgyzstan. Kyrgyzstan has substantial reserves of gold. However, the extraction of gold is very costly and requires additional investing of foreign companies. One of such companies is *Kumtor Gold Company* established by the investors from Canada. Kumtor is based on one of the largest gold deposits in the world. The deposit produced 12.1 million ounces of gold between 1997 and 2018. Kumtor significantly contributes to GDP of Kyrgyzstan. In 2019, the proportion of Kumtor's production in GDP of Kyrgyzstan accounted for 9.8% (*Kumtor*).

There are other big gold mines in Kyrgyzstan such as Jerui, Taldy-Bulak, Makmal and others. *Jerui* deposit is the second largest deposit in Kyrgyzstan located in Talas region and is estimated as 97 tons of gold (Hays, *Kumtor Gold Mine*). *Taldy-Bulak* is the deposit found in Kemin region. Its gold reserves are estimated as 77.7 tons of gold. *Makmal* is the gold deposit developed during the Soviet time. The reserves of Makmal located in Jalal-Abad region amount to 60 tons of gold. (Hays, *Resources in Kyrgyzstan*).

Machinery and metalworking are the industrial sectors that were most negatively affected by the economic crisis of the 1990s. Machinery and metalworking were established in Kyrgyzstan in

the 1940s during the Great Patriotic War when several enterprises of machinery and metalworking were evacuated to Kyrgyzstan. As a result, *Kainda Cable Plant*, *“Tyazhelektromash” Plant*, *Mailisai Electric Bulb Plant*, *“Kyrgyzavtomash”*, *Frunze Car Assembly Plant*, *Osh Pump Plant*, *“Fizpribory”* and others were built.

In 1990, machinery and metalworking contributed 26% to the total industrial production in Kyrgyzstan. At the same time, those enterprises used the metal imported from other union republics and then exported most of the goods produced. After independence, many enterprises of machinery and metalworking shut down. The production of those remained sharply declined, so that in 2001, the contribution of machinery and metalworking to the industries of Kyrgyzstan amounted to 5.2%. Among those enterprises that remain are small enterprises that produce consumer goods.

Prior to independence, radio electronic industry in Kyrgyzstan was represented by *Bishkek Computer Plant*, *Tokmok Radio Plant*, *Tash-Kumyr Semiconductor Plant* and some other enterprises that produced semiconductor materials and radio electronic items. However, after independence, most of them stopped operating because of the lack of raw materials used such as polycrystalline silicon.

Light industry is represented by more than 200 enterprises of textile, garment, tanning, fur and footwear sectors that in 2001 contributed 5.8% to the proportion of industries in Kyrgyzstan. The enterprises of garment industry are located in Bishkek, Tokmok, Osh, Jalal-Abad, Karakol and other cities and provide about 17% of light industry production. Although the enterprises use mainly local raw materials, they face many problems such as old equipment, old technologies, the lack of good processing systems that do not let them be more effective and produce consumer goods of higher quality.

Food industry is the most important and the largest sector in Kyrgyzstan. Food industry includes dairy, meat, horticulture, sugar, milling, tobacco, liquor, confectionary. There are 600 enterprises of food industry in Kyrgyzstan. All of them use local materials

and cover the needs of the domestic market. However, it requires a closer cooperation between farmers and entrepreneurs, the use of high technologies, and the creation of small-size and medium-size enterprises to improve the quality and increase the range of production.

Construction contributed 13.3% to GDP of Kyrgyzstan in 2017 (*Logistics and Transport Competitiveness in Kyrgyzstan* 5). There are 128 enterprises of construction materials in Kyrgyzstan. However, they are not distributed equally on the territory of Kyrgyzstan. The largest enterprises are located in Chui and Osh regions. The most promising sector is the extraction and processing of decorative stones such as marble, granite, basalt. There are also some other sectors of construction materials: cement and slate production, reinforced concrete constructing production, glass making, forestry, polygraphy (Kulmatov 88—97).

4.4. Agriculture

As a result of the agrarian reform in the 1990s, collective and joint farms in Kyrgyzstan had been disintegrated, while peasant and private farms were created. Moreover, the state passed the law that made the purchase and sale of land a common practice. In 2002, about 85 000 private farms, 210 peasant collective farms, 463 agricultural cooperatives, 59 state farms, 43 joint stock companies, and two agrarian farms were created (Kulmatov 97).

Meanwhile, in 2005, only 6.5% of land in Kyrgyzstan was classified as arable, 0.3% was provided for permanent crops, 48% for permanent pastures. The remained territory was mountains, forests, glaciers, lakes and rivers. Most of the arable land is in the valleys: the Fergana and Chui Valleys, the Issyk-Kul Lake basin and some other areas. More than 85% of arable land is irrigated (Hays, *Land, Geography and Weather of Kyrgyzstan*).

Agriculture in Kyrgyzstan is represented by two main sectors: crop production and animal husbandry. Crop production includes grain production, the production of industrial crops, potato production, horticulture, melon cultivation, gardening and viticulture.

In 2001, the share of crop production in the agriculture of Kyrgyzstan accounted for 55.6%.

Grain production is an important sector in crop production. Wheat, oat, rice, corn and bean are grown in Kyrgyzstan. Bean is cultivated in Talas oblast. However, wheat production does not cover the needs of the population for grain. Therefore, wheat is imported to Kyrgyzstan from Russia and Kazakhstan.

Industrial crops are grown in the Chui, Talas and Fergana Valleys. While tobacco is cultivated in Talas, cotton is grown in Fergana, and sugar beet is in Chui oblast, oil crops are produced in all regions of Kyrgyzstan.

Potato is cultivated in the Issyk-Kul basin and the Chon-Kemin Valley as well as Chui, Fergana, Naryn and Talas oblasts. Vegetables and fruits are grown in Chui, Fergana, Issyk-Kul, Talas oblasts. Melons and water melons are cultivated in the Chui and Fergana Valleys. Gardening is practiced in Chui, Issyk-Kul and Fergana regions, while viticulture is in Chui and Fergana.

Crop production is impossible without irrigation. Kyrgyzstan has 632 irrigated systems: *Bolshoi Chuyskiy, Vostochnyi, Yuzhnyi, Zapadnyi, At-Bashinskiy* Canals in the Chui Valley, *Kogartskiy, Otuz-Adyrskiy, Savayskiy* canals in the Fergana Valley, *Talasskiy* in the Talas Valley and many others. There are many reservoirs too: *Toktogul, Naymanskoe, Orto-Tokoyskoe* and others that are used to irrigate crop fields. However, inadequate funding results in the deterioration of the irrigation system in Kyrgyzstan and the loss of crop production.

As a result of the agrarian reform, animal husbandry is not any more a leading economic sector. In 2000, the production of animal husbandry in the agriculture of Kyrgyzstan declined to 43% compared to 60% in 1990. Sheep breeding was a very popular sector in the Soviet time. However, after independence, the number of sheep sharply declined. The animal husbandry of Kyrgyzstan is also represented by cattle breeding, the breeding of horses and pigs, yaks in some regions, beekeeping, poultry, fishery (Kulmatov 97—107).

4.5. Foreign economic relations

Kyrgyzstan cooperates with many foreign countries in various economic and non-economic sectors: transport, tourism, culture. However, the most important sector is trade that accounted for 24.4% of GDP, or more than 6 million USD in 2017 (*Logistics and Transport Competitiveness in Kyrgyzstan 5*).

The cooperation with CIS countries such as Russia, Kazakhstan, Uzbekistan, Tajikistan, Ukraine, Belarus was prioritized till 2000s. However, considerable changes took place later in the geography of foreign economic relations, so that such countries as China, Switzerland, Turkey, Germany, USA, and UK began to predominate. If earlier Russia was the main trading partner, recently it is China. In 1991, the volume of trade with CIS countries accounted for 89% and with other countries for 11%. In 2000, the percentage of trade with CIS countries dropped to 47%, while with the countries of far abroad increased to 52% (Kulmatov 113).

The exports of Kyrgyzstan prevail over its imports causing a negative balance of payments. Exports amounted to 1 790.8 million USD, while imports reached 4 489.9 million USD in 2017. In terms of percentage, exports accounted for 28.5%, while imports for 71.5% (*Logistics and Transport Competitiveness in Kyrgyzstan 3*).

Kyrgyzstan exports non-ferrous metals (gold, antimony, mercury), electricity, cotton, tobacco, leather, textile, fruits, vegetables, construction materials to China, Germany, Switzerland, UK, Uzbekistan, Kazakhstan, Russia. Non-ferrous metals are exported to China, Germany, Switzerland, UK, cotton, vegetables and fruits to Turkey, Russia, Belarus and Kazakhstan, electricity to Uzbekistan and Kazakhstan, construction materials, paper, dairy to Kazakhstan, textile to Russia and Kazakhstan. Because the industrial goods of Kyrgyzstan are not very competitive in the international market, the export of raw materials predominates. The main export is gold that goes to Switzerland. In 2017, Kyrgyzstan's exports to Switzerland accounted for 27.3%, to Kazakhstan 15.8% , to Russia 15.4%, to UK 10.7%, to Turkey 7.3% (*Logistics and Transport Competitiveness in Kyrgyzstan 4*).

Kyrgyzstan imports oil and oil products, natural gas, cast iron, steel from Russia, Kazakhstan, Uzbekistan, Turkmenistan, wheat and other crops from USA and Kazakhstan, clothing, cast iron and steel from China. In the composition of imports, the share of CIS countries prevails that can be explained by the dependence of Kyrgyzstan on raw materials from CIS countries. In 2017, 33.4% were Chinese imported goods, 26.3% were Russian, 13.2% were from Kazakhstan and 5% from Turkey (*Logistics and Transport Competitiveness in Kyrgyzstan 4*).

Kyrgyzstan is a member of many international economic organizations: the World Trade Organization, the Organization for Security and Cooperation in Europe, the Economic Cooperation Organization, the Organization of Islamic Cooperation, the Shanghai Cooperation Organization, the Eurasian Economic Union and others.

The most active regional cooperation is carried out within the Eurasian Economic Union. The Eurasian Economic Union have lifted all tariffs and restrictions for its members-states and let free movements of individuals and companies on their territories. In 2017, the trade with the Eurasian Economic Union reached 38.6%: 31.7% of exports and 41.4% of imports (*Logistics and Transport Competitiveness in Kyrgyzstan 5*).

At the same time, the trade with China within the Shanghai Cooperation Organization is carried out under the regulations of the World Trade Organization. Kyrgyzstan's membership in the World Trade Organization created favorable conditions to gain access to the markets of its members-states. However, strict international standards followed by the countries of the European Union cause many barriers for the trade with European countries (*Logistics and Transport Competitiveness in Kyrgyzstan 5*).

There are many companies in Kyrgyzstan established jointly with foreign partners: Kumtor Gold Company (Canadian gold mine company), Reemtsma (Kyrgyz-German tobacco company), Elvest (Kyrgyz-USA dairy company), Vim-Bil-Dann (Kyrgyz-Russian dairy company). Foreign investors contributed to the construction of the most important roads in Kyrgyzstan, Manas International Airport in Bishkek, Hayat and Ak-Keme Hotels in Bishkek city.

The investments are provided by Russia, Kazakhstan, Uzbekistan, Japan, Germany, Switzerland, Turkey, China, USA, Canada, UK. The largest international donors of Kyrgyzstan are the World Monetary Fund, the World Bank, the Asian Development Bank, the Islamic Development Bank (Kulmatov 112—116).

5

TOPIC

TRANSPORT AND SERVICES

5.1. Transport

The transport system plays an important role in the economy of Kyrgyzstan. It connects producers and customers, provides goods and services, integrates local markets and regions, and ensure the economic security of the country. Transport costs are important because they are included in the cost of exported and imported goods and finally contribute to the competitiveness of goods in the international market.

Kyrgyzstan is an important transit country in Eurasia between Russia, Kazakhstan, China, South Asia and the Middle Eastern states. However, Kyrgyzstan has underdeveloped transport system that does not adequately meet the needs of the economy and people in the country. The landlocked position of Kyrgyzstan, its mountainous landscape and harsh climatic conditions, the lack of financial resources and the disputes over the border areas with neighboring countries create many obstacles for the development of the transport system in the country.

The transport costs are very high in Kyrgyzstan to compare them to the transport costs of other countries with more developed transport infrastructures, especially those who have access to the sea. As a result, the goods imported to Kyrgyzstan are more expensive, while the goods exported from Kyrgyzstan are less competitive in the international market. At the same time, many efforts have been made by the state and the government over the last decade to improve the situation with the transport infrastructure in Kyrgyzstan (*Logistics and Transport Competitiveness in Kyrgyzstan* 6—7).

The transport system of Kyrgyzstan is represented by road, railway, inland waterway and air transport.

5.2. Road transport

In view of the country's landlocked position and its mountainous nature, the main transport in Kyrgyzstan is road transport that contributes 95% to cargo and 99.7% to passenger traffic of Kyrgyzstan (*Logistics and Transport Competitiveness in Kyrgyzstan* 17).

Kyrgyzstan has the road network of 34 000 kilometers including 19 000 kilometers of public roads controlled by the Ministry of Transport and Roads of Kyrgyzstan and 15 000 kilometers of roads in cities, villages, agricultural, industrial and other enterprises. The length of roads of international importance is 4 000 kilometers including 2 232 kilometers of international road corridors, 5 616 kilometers of national roads and 9 105 kilometers of local roads. At the same time, the length of paved public roads is 8 089 kilometers including 6 390 kilometers with asphalt-concrete surfacing and 1 699 kilometers with a black gravel surface. Gravel roads are estimated at 9 083 kilometers and unsurfaced roads at 1 639 kilometers (*Logistics and Transport Competitiveness in Kyrgyzstan* 18).

Traffic density and road quality vary in Kyrgyzstan. The density of traffic on international roads is greater than on public and local roads: 75% of traffic on international roads, while on public and local roads there are 15% and 10% correspondingly (*Logistics and Transport Competitiveness in Kyrgyzstan* 22). In terms of road quality, the highest quality of roads is recorded in Chui oblast compared to Naryn oblast that has the lowest road quality in the republic due to difficult geographical and climatic conditions.

It is worthy of note that the quality of roads depends on financing. The maintenance of old roads and the construction of new roads require significant investments of the state. Due to the lack of state funds, the most important highways of the country

are maintained at the expense of foreign investments or foreign loans (Kulmatov 107).

Most of the loans for the construction and repair of roads are provided by China. China gives loans that have to be realized by Chinese companies. The loans significantly contribute to the external debt of Kyrgyzstan to China that is estimated at 41.6% of the total external debt of Kyrgyzstan or 4.45 billion USD (*Logistics and Transport Competitiveness in Kyrgyzstan* 3).

Figure 5.1. Road network of Kyrgyzstan



Source: *Logistics and Transport Competitiveness in Kyrgyzstan*. United Nations, Geneva, 2020, p. 21.

Unlike the road construction industry that is state-owned, the road transport industry has been completely privatized after independence. Presently, there are 1.2 million road vehicles in the country, 350 companies engaged in the transportation of passengers and goods, more than 32 000 employees working in the road transport industry, and 72 enterprises responsible for the road transport logistics such as bus stations and ticket offices (*Logistics and Transport Competitiveness in Kyrgyzstan* 33).

Presently, there are 85 transport, shipping and logistics companies registered and more than 20 300 individuals work in the

transport of goods. More than 74% of 85 companies are located in Bishkek city, 18% are located in Chui oblast and one company can be found in each oblast. Many companies lack qualified personnel, a fleet of vehicles, warehouses, modern equipment and offices (*Logistics and Transport Competitiveness in Kyrgyzstan* 36).

Road transport is the main transport in the carriage of passengers. There are 9 412 buses and minibuses that daily operate along 981 bus routes in the country including electric trolley busses that operate along trolley bus routes in Bishkek (148 trolley buses on 18 routes), Osh (22 trolley buses on two routes), and Naryn (seven trolley buses on one route) cities. Recently taxi transport has gained more popularity, so that the number of passengers that use taxi services has grown several times since the 1990s (*Logistics and Transport Competitiveness in Kyrgyzstan* 43).

5.3. Railway transport

The railway transport is not very developed in Kyrgyzstan. It connects Kyrgyzstan to other Central Asian and CIS countries but does not provide the communication between two main parts of the country: Northern Kyrgyzstan and Southern Kyrgyzstan.

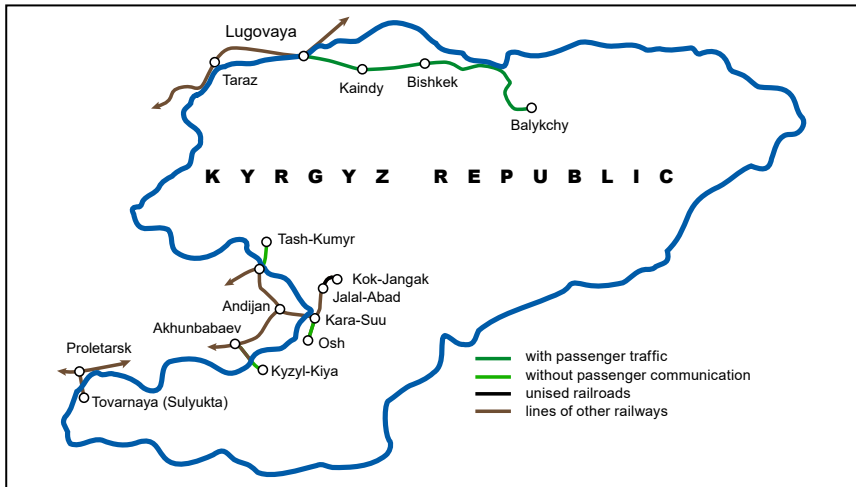
Originally, the railway transport of Kyrgyzstan has been divided into two sections: northern and southern railways. Northern railway connects Kyrgyzstan to Kazakhstan, while southern railway connects Kyrgyzstan to Uzbekistan. The total length of railways is 423.9 kilometers. Nowadays it is mostly used to carry cargo that represent 3% of total cargo in Kyrgyzstan and 1% of all passengers in the republic (Kulmatov 107).

The longest and the most important railway section in the economy of Kyrgyzstan is the northern line Lugovaya-Balykchy that connects Kyrgyzstan to southern Kazakhstan. It is 323.4 kilometers long. It carries cargo and passengers from Kyrgyzstan to Kazakhstan and Russia as well as domestic cargo between the northern oblasts and cities of Kyrgyzstan. More than 7 million tons of metals, oil products, minerals are transported annually by this rail (*Logistics and Transport Competitiveness in Kyrgyzstan* 56).

The southern railway section of Kyrgyzstan is 101.2 kilometers long. It connects the Fergana Valley cities in Kyrgyzstan to Uzbekistan. Four lines in Tash-Kumyr, Jalal-Abad, Osh and Kyzyl-Kiya connect the coal deposits of Tash-Kumyr, Kok-Yangak and Kyzyl-Kiya to the cities of Uzbekistan (*Logistics and Transport Competitiveness in Kyrgyzstan* 56).

The main aim in the development of the railway infrastructure in Kyrgyzstan is the construction of the railway line from China through Kyrgyzstan to Uzbekistan that would not only connect Northern Kyrgyzstan to Southern Kyrgyzstan but also let it join the southern corridor of the Eurasian transcontinental railway and get access to the Pacific Ocean, the Persian Gulf and the Mediterranean Sea.

Figure 5.2. Railways in Kyrgyzstan



Source: *Logistics and Transport Competitiveness in Kyrgyzstan*. United Nations, Geneva, 2020, p. 56.

5.4. Inland waterway transport

The inland waterway transport is represented by the water transport on the Issyk-Kul Lake. In the Soviet time, the inland

waterway transport of Kyrgyzstan used to carry cargo and passengers from Balykchy to Karakol and from Karakul to Balykchy back. It delivered coal, wheat and other goods to Karakol and brought plaster to Balykchy. The shipping company that was created after independence of Kyrgyzstan to transport goods and passengers bankrupted after independence, so that the volume of goods carried by water transport declined since then. Therefore, the contribution of water transport to the cargo and passenger traffic of Kyrgyzstan is very small, and does not play any significant role in the economy of Kyrgyzstan (*Logistics and Transport Competitiveness in Kyrgyzstan* 67).

5.5. Air transport

The role of air transport in the transport system of Kyrgyzstan has been growing dramatically for the last decade. The mountainous landscape of Kyrgyzstan, the lack of access to the sea, the underdevelopment of road and railway transport, made the development of air transport one of the priorities for the economy of the state. Besides, increasing mobility of the population inside and outside Kyrgyzstan contributed significantly to the growth of passenger and cargo traffic by air.

The Civil Aviation Agency established under the Ministry of Transport and Roads of Kyrgyzstan has 22 airlines registered including three cargo airlines, nine airlines for passengers, 10 airlines for special purposes. Out of 22 airlines, only 10 airlines have valid certificates: Avia Traffic, Air Manas, Tez Jet and others. In 2018, the civic aviation of Kyrgyzstan had 34 aircrafts including 15 airworthy aircrafts, 19 not airworthy aircrafts and three helicopters. All airlines and aircrafts of Kyrgyzstan appeared in the black list of the European Union as a result of the 2009 and 2016 audits. Therefore, most of air passengers and cargo to and from Kyrgyzstan are carried by foreign airlines and carriers (*Logistics and Transport Competitiveness in Kyrgyzstan* 75).

Presently, 37 airlines operate in Kyrgyzstan including 32 international and five domestic airlines. In 2016, domestic airlines

carried 1 116 479 passengers including 613 682 passengers on international flights that was 11% less than in 2015, and 502 797 passengers on domestic flights that was 1.3% less than in 2015, while foreign airlines carried 1 459 811 passengers on international flights that was 9.5% more than in 2015 (*Logistics and Transport Competitiveness in Kyrgyzstan* 87).

Kyrgyzstan has air service agreements with 27 countries and regular flights with the Russian Federation, Kazakhstan, Uzbekistan, Tajikistan, China, Turkey, Mongolia, India and the United Arab Emirates (*Logistics and Transport Competitiveness in Kyrgyzstan* 87).

There are 11 airports in Kyrgyzstan including five international airports. The international airports in Kyrgyzstan are *Manas International Airport* in Bishkek city, *Osh International Airport* in Osh city, *Issyk-Kul International Airport* in Tamchi Village, *Karakol International Airport* in Karakol city, and *Batken International Airport* in Batken city. The remaining six airports in Naryn, Talas, Jalal-Abad, Kazarman, Kerben and Isfana are local.

5.6. Services

The contribution of the services sector to the economy of Kyrgyzstan has increased significantly. Services contributed 24.5% to GDP in 2017 (*Logistics and Transport Competitiveness in Kyrgyzstan* 5). It has been caused by the expansion of existing services and the creation of new services offered to the population. Various educational, health care, municipal, consumer, postal, financial, communication services appeared in the domestic market. From 1995 to 2000, educational services increased three times, while health care services 1.6 times. The volume and variety of free services has significantly declined, while the volume and variety of paid services have considerably grown. At the same time, it appears to be difficult for vulnerable social groups to cover their utilities and compensate for their consumer services, since their costs are very high (Kulmatov 110—111).

Computerization and digitalization of Kyrgyzstan resulted in the era of new technologies and new services. The services that

were provided in the past transformed completely. In addition to state-owned postal services *Kyrgyz pochty*, international express postal services such as *DHL*, *Fedex*, *Pony Express* have been introduced by private companies. The services of telecommunication system *Kyrgyztelecom* run by the state has been supplemented by private mobile providers such as *Megacom*, *Beeline*, *O* and others. Traditional cable TV and mass media is being substituted by online TV and news offered by various Internet sites and social media. TV and radio broadcasting are not any more the priority of state companies such as *KTRK* but can be offered by private TV channels as *Pyramida*, *NBT*, *EITR*, *5 Kanal* as well as radio channels such as *Radio Azattyk*, *Evropa Plus*, *Radio Mir*, *Birinchi Radio* and many others. Traditional shopping is gradually being replaced by online shopping. The infrastructure of catering become more diverse. Many cafes and restaurants offer delivery and online services.

5.7. Banking

The banking system of Kyrgyzstan has undergone serious changes after independence. Banks turned to be the main providers of financial services to the population. Customers of banks receive their salaries and pensions, save and deposit money, take loans through banks.

At the same time, the distribution of bank services and the access to financial resources differ across the regions. Bank loans are mostly taken in Bishkek capital. Southern regions have the poorest access to the bank services of Kyrgyzstan. The use of mobile or online banking is very limited. Only 12% of the population use mobile phones to make bank transactions. The lack of the Internet connection in remote and rural areas of Kyrgyzstan prevent people from using online banking services and force them to prefer cash. 90% of transactions with bank cards are cash withdrawals. People withdraw money from their accounts to pay cash for their goods and services. Even in the capital, cash payments are still predominant. Non-cash payments are mainly possible in supermarkets and cafes (Hasanova 26).

There are many challenges that are faced by the population in the financial sector of Kyrgyzstan such as poor development of digital technologies, the lack of access to the Internet and others. One of the biggest issues is financial illiteracy of the population. Many people do not have a basic knowledge about their finances, don't record their transactions and don't make any savings. They are not aware of the recent developments in the banking sector and the services offered to individuals and companies. At the same time, financial literacy is the key factor in the development of the financial system in Kyrgyzstan as well as individual financial well-being.

5.8. Tourism

Kyrgyzstan with its splendid rivers, lakes, mountains and resorts can develop various types of tourism such as ecotourism, leisure tourism, adventure tourism, sport tourism, cultural tourism. Tourism is a new promising sector in the economy of Kyrgyzstan that can attract substantial funds to the budget of the state and private tourist companies. Moreover, it can provide extra jobs to its citizens. However, the potential of tourism industry is not fulfilled, and Kyrgyzstan falls behind its neighbors such as Kazakhstan, Uzbekistan and Russia in terms of the number of tourists attracted to the country.

There are 10 360 entities registered in the tourism sector by 2016. Among them, 31% or 3 158 are tourist companies, while the remaining 69% are self-employed businessmen. The percentage of people employed in tourism industry accounted for 3.7%, while the total contribution of tourism sector to GDP of Kyrgyzstan was 3.9% in 2016. Nevertheless, some experts believe that tourism industry of Kyrgyzstan does not realize its full potential, so the contribution of tourism to GDP of Kyrgyzstan can reach 7.9% (Jenish 7—11).

The policy of the Kyrgyz government in the tourism sector is quite liberal and unrestrictive. For example, tourist companies in Kyrgyzstan are subject to 10% corporate income tax compared to 20%

corporate income tax in neighboring Kazakhstan. Moreover, many small tourist agents may work under a special tax arrangement called “patent” that allows self-employed businessmen of Kyrgyzstan paying fixed fees instead of 10% corporate income tax.

However, there are many obstacles and challenges that are faced by the tourism sector of Kyrgyzstan. To list some of them are weak marketing and insufficient use of digital technologies such as the websites of tourist companies that do not provide sufficient information about tourist products, poor quality of tourist services, short seasonality of leisure and beach tourism in Kyrgyzstan compared to Turkey and the United Arab Emirates, environmental pollution. However, the biggest challenge is the lack of developed infrastructure in the country such as direct flights to Kyrgyzstan, good roads, convenient hotels, the availability of restrooms, supermarkets, the Internet connection in regions outside Bishkek city (Jenish 29).

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