

KAZAKHSTAN

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The Republic of Kazakhstan is a unitary state with the presidential form of government and a parliamentary legislative body. A former member of the Union of Soviet Socialist Republic, Kazakhstan became independent on December 21, 1991. In 1997, its capital moved from Almaty to Astana. Kazakhstan is the ninth largest country in the world. Because the country is so large, it has a wide variety of climate, terrain, soil parent material and type, and vegetation.

Kazakhstan is a country of vast socio-economic diversity ranging from rustic camp to cosmopolitan city. It also has a wide variety of religions; the majority of the population is either Muslim or Russian Orthodox. Kazakhstan has important resources of oil, coal, iron ore, manganese, chromite, lead, zinc, copper, titanium, bauxite, phosphate, sulfur, gold, and silver. However, because of years of neglect, its industrial base is undergoing much-needed repair and updating. Recently, Kazakhstan's economy has had

double-digit or near double-digit growth as a result of its energy sector, aided by economic reforms, good harvests, and foreign investments.

Kazakhstan's agriculture is also diverse, ranging from small farms to large cooperatives raising crops and livestock. The agricultural base is another important resource with fertile soils and extensive irrigation. Like the industrial base, it is also in a period of transition.

Terrain and climate

Kazakhstan has a population of about 17 million people. It is bordered by Russia on the north, China on the east, Kyrgyzstan and Uzbekistan on the south, and Turkmenistan and the Caspian Sea on the west. It covers an area of about 2.72 million square kilometers (1 million mi²), ranging about 1,600 km (1,000 mi) from north to south and 3,000 km (1,900 mi) from east to west.

Most of the country has a continental climate with cold winters and hot sum-

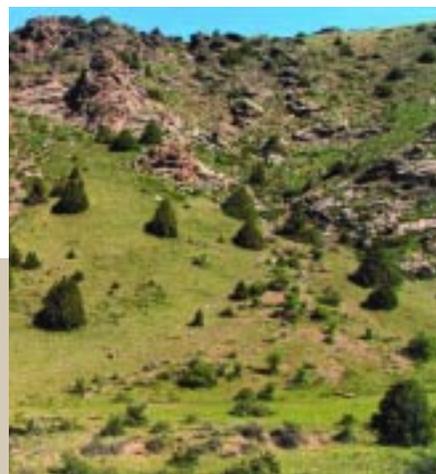


Figure 1
Picture from the dry steppes of Kazakhstan.

mers. Most of the republic is dry, except for the mountains of the extreme south and east (Figure 1). Annual precipitation for northernmost Kazakhstan is 315 mm (12 in). In central Kazakhstan, annual precipitation is about 150 mm (6 in). In the foothills of the mountains, the amount of precipitation increases until it reaches 880 mm (35 in) in the forested sections of the mountainsides.

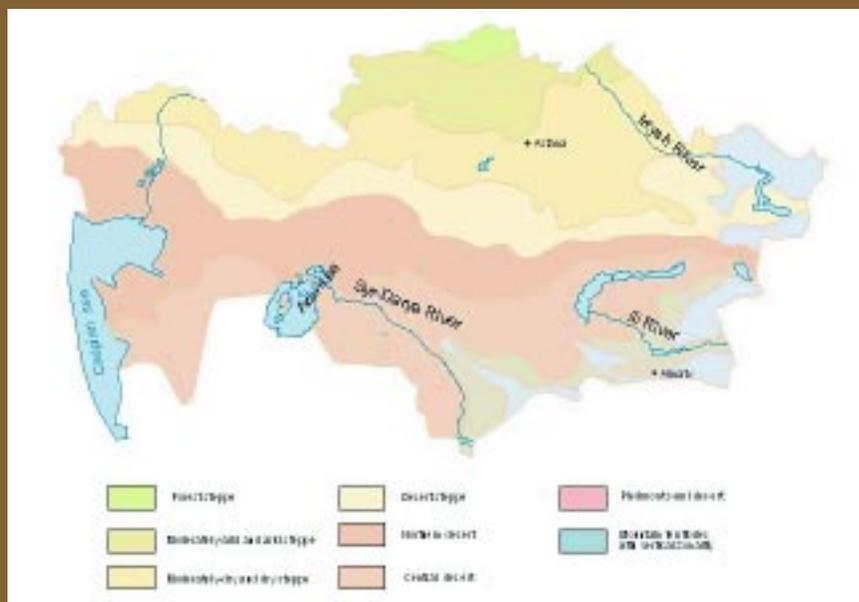
Most of the country is flat lowlands that are less than 500 m (1,600 ft) in elevation. The country is ringed to the south and southeast by the picturesque, snow-capped Tjan Shan and Altai Mountains. Other areas of the country include plateaus and lesser mountain ranges that rise 200 to 500 m (650 to 1,300 ft) above the surrounding terrain to heights of about 1,000 m (3,300 ft) above sea level.

State of the soils

According to soil surveys, Kazakhstan has about 220,000 ha (540,000 acres) of arable land. Yet more than that has been cultivated in the past to boost production. Recently, cultivated land was estimated at 29 million ha (70 million acres).

Soils are distributed throughout the country in zones that correspond roughly to the vegetation zones (Figure 1). In the northern forest-steppe (where birch kolki alternate with open areas), soils are deep, dark, and rich northern or moderately-damp chernozems. Northern

Figure 2
Vegetative zones of Kazakhstan.



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chernozeams mixed with meadow soils and small areas of saline soils cover about 1 million ha (2.5 million acres) of land in an area where precipitation and evaporation are approximately equal.

Moving south, in the extensive herb-grassland steppe, soils are southern or moderately-droughty chernozeams. In these areas, chernozeams are interspersed with saline soils because there and to the south, evaporation exceeds rainfall. These soils can be compacted, low in organic matter, and shallow, at times shallow enough to be unsuited for cultivation but suitable for pasture.

South of the herb-grassland steppe, the tipchak-feather grass steppe has chestnut soils that developed in a drier climate and are not as fertile as the chernozeams. Further south, in the desert steppe, are brown soils that typically develop in semiarid climates. These soils are rich in nutrients and low in organic matter. Still further south is the flat desert where sandy and gray-brown soils developed under dry conditions but can be productive under irrigation.

The steppes, especially the southern steppes, have large areas of saline soils, occupying 6 million ha (15 million acres). Saline soils are found mainly in shallow undrained depressions, terraces, and flat areas with deep water tables.

The foothills of the Tjan Shan Mountains have sierozem soils with low organic matter and sparse vegetation. These soils developed in areas of warm, wet springs, hot, dry summers, and moderately cold winters. Soil types, ranging up the mountain, are: chestnut soils, grading into chernozeams, mountain-forest, and mountain-meadow sub-alpine soils developed at altitudes above 2,200 m (7,200 ft) and finally alpine soils that developed above about 2,900 m (9,500 ft).

At the foot of the Altai Mountains,

chestnut soils grade into chernozeams with increased elevation, then gray forest soils, mountain-forest, mountain-podzolic, and mountain-meadow soils.

The soils of Kazakhstan are an enormous resource that needs to be developed and used in a rational, sustainable manner. Soil and agricultural development can help maintain stability of the new Republic. Soil management capabilities are being researched at several institutes throughout the country to maintain fertility, ameliorate salinity, reduce compaction, etc. Soil research is coordinated through the Institute of Soil Science in Almaty.

Conservation practices

Under the Soviet system, agricultural management was scheduled: how much land to plant a specific crop; how to manage the crop; how much fertilizer to apply, etc. With the onset of independence and a free market, this has all changed. On the one hand, dry-land acreage in cereal production has shrunk because of decreased yield and diminished grain quality. The reduced yield and quality are probably a result of less fertilizer and herbicide, because they have become too expensive for common use. On the other hand, highly-productive irrigated acreage in the south has increased because of the demand for high quality grain, fodder, vegetables, and industrial crops.

During the transitional period from the previous government to free markets, education is expected to play an important role. Producers and farm managers need to learn more progressive farming techniques and decide which ones can be best adapted to their conditions. They also need to learn new ways to deal with farm economics including financing of large equipment and accounting in a free market. They will need courses aimed at

a range of situations and educational levels from subsistence farms to large tracts of land.

To optimize agricultural production, farmers will also need cooperation from the economic community. The agricultural sector requires large infusions of capital for equipment and infrastructure. Farmers need to rent or purchase large tracts of land that are currently held in trust by local authorities. It is possible that some economic incentives can come through cooperatives that can also promote modern production management techniques. Some cooperative structure might also be available for development from the former collective farms.

The decline of the collective farms is accompanied by a decline in financial, social, and cultural support systems that have been in place for years. Old support systems need to be rebuilt to curb unemployment and prevent cultural disintegration, but that will take money, time, and education. Rebuilding of Kazakhstan is underway and its growth is slow and painful, especially for the agricultural sector, where changes are just beginning.

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