Surface water resources in the territory of the Republic of Kazakhstan are extremely unevenly distributed and characterized by significant long-term and intraannual variability. Due to climatic conditions, almost all of the surface runoff occurs in the spring. According to official data, the specific water supply in Kazakhstan is 37 thousand $m^3$ per 1 $km^2$, which is one of the lowest indicators among the CIS countries. Considering the territory of the republic, it is possible to identify water-abundant regions, for example, the basin of the Irtysh River, and water-scarce regions, especially in the central and northern regions of the country.

The geographical basin of the Esil River is located in the northern and central parts of the Republic of Kazakhstan, administratively it includes the Akmola and North Kazakhstan regions. The study area is considered one of the most important industrial and agricultural regions of the republic, where agriculture is the dominant branch of the economy. The water factor is important for sustainable agricultural production.

Under natural conditions, the Esil River basin is characterized by high variability of annual runoff and extreme unevenness of its intra-annual distribution. The water supply of the basin territory with river runoff is 11.8 thousand $m^3$/year per 1 $km^2$, while the average water supply in the country is 20.6 thousand $m^3$/year per 1 $km^2$. Thus, the development of the region is constrained by limited water resources.

The development of economic sectors in this region is hampered by growing water scarcity, surface and groundwater pollution, excessive water losses in water management systems, aggravating problems of supplying the population with quality drinking water, problems of interstate water distribution. Thus, there are now real threats to sustainable development and ensuring environmental sustainability of the territory of the studied region. The vulnerability of the capital of Kazakhstan, Astana, and the Esil river basin as a whole was also revealed. In this regard, attention should be paid to the ecological state of the Esil River, the hydrological regime of which was changed as a result of the construction of the Astana (formerly Vyacheslav) reservoir. In fact, as part of the landscaping, a dam was built within the capital and the riverbed was significantly widened. At the same time, in order to maintain the water level, the river was divided into sections separated by a number of spillway-type dams, which significantly reduced the speed of water movement and therefore worsened the ecological condition of the Esil River. There are also problems with the supply of water to the inhabitants of the capital due to the increasing water consumption associated with the population growth. In the current situation, it is necessary to develop and implement appropriate measures for the management of water resources. Therefore, in order to achieve sustainable development of the region, the priority task of the research is to develop recommendations for reducing water scarcity in the Esil River Basin. The study will consider the method of territorial redistribution of river flow as one of the measures aimed at providing sufficient supply to water-scarce regions.

It is also a holistic, interlinked approach, transcending industry boundaries and contributing to the sustainable development of the most important economic sectors. The comprehensive nature of the study highlights the interrelationships and

complementarities that exist between different aspects of sustainable development in the Esil River Basin.

Water scarcity affects food security. The studied area is considered one of the most important industrial and agricultural regions of the Republic, where agriculture has a significant impact on the overall socio-economic situation. Thus, the region specializes in grain production, and the development of animal husbandry has significant prospects, which requires additional volumes of water.

The sustainable development of the region requires an adequate energy supply. Kazakhstan is committed to the Paris Agreement and has adopted a low-carbon development policy to address the issue at the national level. The studied area is energy deficient and imports electricity from other regions of the country. In order ensure energy sustainability while taking into account the norms of the Paris Climate Agreement, it is crucial to develop alternative energy sources.

Tentatively, the key findings of the study will be as follows.

1. The conducting research is aimed to substantiate the need for territorial redistribution of water resources, taking into account the norms of international law in the field of transboundary water use. The system of redistribution of water resources is usually understood as water transfer, which includes a complex of hydraulic and other structures that provide water withdrawal from a region oversupplied with water and its delivery through the watershed to neighboring or distant watersheds with low water. The Irtysh River is considered to be a donor river.

In the course of the study, it is crucial to assess the maximum allowable volume of water withdrawal from the donor river, taking into account the political, environmental and economic aspects of water use. It was tentatively estimated that the volume of water withdrawal from the Irtysh River for distribution to Northern and Central Kazakhstan would make up from 1 to 1.5 $km^3$ per year, with irretrievable water withdrawal from the Irtysh River not exceeding 10% intensity of water use which would be classified as moderately reasonable.

2. From the practical point of view the proposed study considers the most efficient development of a route for inter-basin transfer of estimated water volume with the implementation of the GIS technologies.

The proposed canal to supply the central and northern regions of Kazakhstan can be laid within the Kazakh lowlands, which is characterized by general elevation of the territory with a range of altitudes from 200 to 1500 meters. The choice of such a route allows to maintain self-flowing option with minimal elevation by pumping stations, using the existing infrastructure along most of the canal route.

3. Another key outcome within the framework of the study is the justification of sanitary discharges in order to improve the ecological condition of the Esil River.

When implementing the transfer of the withdrawn volume of flow from the Irtysh River, it will be possible to provide sanitary discharges in the stream of the Esil River, especially in the part that flows within the territory of the capital of Kazakhstan, the city of Astana. Sanitary discharges will significantly improve the ecological condition and water quality of the Esil River. The study will substantiate the norms of sanitary discharges, which are still not fully applied in Kazakhstan.

4. The paper also aims to develop sustainable agricultural production and improve local and regional food security. For sustainable development it is necessary to rationally use all competitive advantages of the region. In particular, the great potential lies in the fact that agro-climatic conditions of Central Kazakhstan are favorable for cultivation of hard wheat, the cost of which in the world market is higher than soft wheat. Hard wheat is less resistant to soil drought and responds better to irrigation than soft wheat. In particular, international experience shows that due to irrigation and competent agrotechnology spring wheat productivity in the zone of risky farming can be increased by 5-6 times. Additional volumes of water allow developing local production of wheat and other valuable agricultural crops.

5. Last but not least, the study will need to develop measures to improve the stability of the energy system in the region. The paper proposes to envisage the most optimal scenario for the development of alternative energy in the studied region. However, the main obstacle in the development of alternative energy is economic profitability, which is also caused by investment risks. In this regard, the issues of energy supply in the region will be of purely recommendatory nature.

In conclusion, water availability in Central Kazakhstan is a critical issue for sustainable development in the region. In order to ensure sustainable economic growth and human development, it is necessary to prioritize the efficient and equitable use of water resources, invest in modern water infrastructure, promote sustainable agricultural practices and ensure equal access to water. By taking these measures, Central Kazakhstan can overcome water scarcity and achieve sustainable development in the long term.