

NP JSC "South Kazakhstan University named after M. Auezov»



PROGRAM FOR RATIONAL
USE WATER RESOURCES

Introduction

Water stewardship refers to the practice of using water in a way that meets current needs without compromising the availability of water for future generations and for water-dependent ecosystems.

Water is a vital and finite resource that is critical to all forms of life and to the functioning of healthy ecosystems. However, as populations grow and economies develop, demand for water increases, resulting in increased competition for limited water resources.

Managing water wisely is essential to ensure sustainability and meet the needs of future generations. It includes a range of policies and practices aimed at improving water use efficiency, reducing consumption and protecting water resources.

Sustainable use of water requires a comprehensive approach that includes infrastructure investment, behavior change, economic incentives and education. By taking action to manage water resources, we can ensure the sustainable use of this precious resource for present and future generations.

Water Management Program

The goal of this program is to reduce water consumption at the university, promote sustainable water management, and raise awareness of the importance of water conservation.

The University undertakes:

- Reduce water consumption in all relevant operations.
- Integrate water stewardship principles into all relevant management policies and practices.
- Invest in water-saving technologies and infrastructure.
- Engage students, faculty, staff, and community members in water stewardship initiatives.
- Collaborate with other organizations to promote water conservation efforts at local and regional levels.

Basic principles of rational use of water resources on university campuses:

- Water is a precious and limited resource that must be protected.
- Managing water wisely is critical to achieving sustainability and reducing environmental impact.
- Research and education play a critical role in promoting understanding and awareness of water management efforts.
- Collaboration and partnerships are critical to achieving water stewardship goals.
- Each generation is responsible for ensuring water resources for future generations.

The University will implement this program by:

- Conducting a water consumption audit to identify areas where consumption can be reduced.
- Installation of water-saving fixtures such as low-flow showerheads and faucets in all campus buildings.
- Encouraging sustainable landscaping that minimizes the need for watering.
- Conducting campaigns to raise awareness of the importance of water conservation and encouraging behavior change.

- Collaborate with local utilities and environmental organizations to support broader water stewardship efforts.

State of water resources in Kazakhstan

Kazakhstan is the largest landlocked country in the world by area with limited water resources. The country faces significant water resource challenges. Kazakhstan has one of the lowest per capita water availability rates in the world. By 2040, water demand is expected to exceed supply by 40%.

Kazakhstan's water resources are unevenly distributed, with most water reserves concentrated in the northern and eastern parts of the country. The southern and western regions suffer from chronic water shortages.

Kazakhstan's water resources are subject to pollution due to industrial and agricultural runoff and household waste.

Kazakhstan's aquatic ecosystems, such as rivers, lakes and wetlands, are being degraded due to overuse of water, climate change and pollution.

Climate change is having a serious impact on Kazakhstan's water resources, leading to melting glaciers, changes in precipitation patterns and increased evaporation.

Sustainable water management:

1. Developing and implementing sustainable water management practices is critical to meeting community needs and preserving aquatic ecosystems.
2. Water conservation and efficiency: Promoting water-saving technologies and practices, such as drip irrigation and water reuse, can help reduce water consumption.
3. Treatment and Pollution Control: Investment in treatment plants and implementation of strict pollution control measures are necessary to protect water resources from pollution.
4. Restoring aquatic ecosystems: Restoring and protecting aquatic ecosystems, such as wetlands and floodplain forests, is critical to maintaining biodiversity and providing ecosystem services.
5. International cooperation: Kazakhstan shares transboundary water resources with its neighbors. Collaboration to jointly manage these resources is critical to ensuring water security for all stakeholders.

The Government of Kazakhstan is taking steps to address water issues, including:

- ✓ Development and implementation of a national water strategy.
- ✓ Investing in water infrastructure such as dams, canals and wastewater treatment plants.
- ✓ Encourage water-saving technologies and practices.
- ✓ Implementation of pollution control measures.
- ✓ Creation of protected areas to protect aquatic ecosystems.
- ✓ Cooperation with neighboring countries on transboundary water resources management issues.

Measures at the university for rational water use:

- Installing water-saving fixtures such as low-flow showerheads and faucets in all campus buildings.
- Introduction of rainwater harvesting systems for irrigation and other non-potable purposes.
- Use of drip irrigation and other water-saving methods on campus.
- Regular monitoring and maintenance of plumbing systems to detect and repair leaks.

Develop and implement a campus water management plan that defines water management goals and strategies.

Establishing standards and guidelines for the sustainable use of water in all campus operations.

Raising awareness among students, faculty and staff about the importance of water stewardship and encouraging behavior change.

Introduction of incentive programs for the implementation of water-saving measures.

Collaborate with local utilities and environmental organizations to promote water conservation efforts.

Partnership with other universities and institutions to share knowledge and best practices.

Participation in regional and national initiatives on rational water use.

University projects on the rational use of water resources.

“Ecological monitoring of underground water supply sources in the southern region of Kazakhstan and recommendation of optimal water treatment technology.” Supervisor PhD Azimov Abdugani Mutalovich.

“Research on quality monitoring and development of methods for reducing the hardness of drinking water in the settlements of Togus, Mayatas, Zhylanbuzgan, Aynatas, Badam-1 A, Bazarkakpa, Abdulabad, Otemis, Shanghai, Terekzar, Turdyabad, Altyntobe, Kokbulak.” Head Ph.D., Associate Professor Khusanov Zh.E.

Ways to solve the problem of fresh water shortage:

Improving water management:

Develop and implement comprehensive water management plans that address all water use needs. Assess and manage risks associated with water scarcity by monitoring water supplies and forecasting future needs. Encouraging sustainable irrigation practices such as drip irrigation and runoff management.

Reduction and rational use of water:

Raising awareness of the importance of water conservation and changing consumer behavior. Establishing economic incentives for rational use of water, such as differentiated water tariffs. Adoption of water saving technologies and practices in all sectors including agriculture, industry and households.

Protecting ecosystems and waterways:

Protecting watersheds and forests, which play an important role in regulating water flows and maintaining water quality. Restoring wetlands and other wetlands that naturally filter water and provide habitat for wildlife. Limiting pollution of waterways from industrial runoff, agricultural runoff and household waste.

The University is establishing cooperation with neighboring countries on issues of transboundary water resources management. Promotion of regional and international agreements on equitable distribution of water resources.

The exchange of knowledge and best practices in the field of water resources management is also important.

Now the university is looking for innovative solutions to these problems, including supporting research and development in the field of water-saving technologies and sustainable water resource management. Encouraging the adoption of innovative solutions such as artificial intelligence technologies to optimize water use. Invest in green technologies such as permeable pavements and roofs that help replenish groundwater.

The principle of rational use of water

Water is a precious resource, and its conservation and sustainable management are critical to the future well-being of the planet and its people. Now it is very important to meet the current needs of people and society without harming future generations.

Support water-dependent ecosystems.

This principle is based on the recognition that water is a finite and irreplaceable resource, and that its wise use is critical to sustainable development.

Principles of rational water use include:

- ✓ Efficiency: Reduce water use by implementing water-saving technologies and practices.
- ✓ Equity: Ensuring fair and accessible distribution of water resources for all users.
- ✓ Conservation: Protecting and restoring aquatic ecosystems and natural habitats that depend on water.
- ✓ Pollution: Minimizing pollution of water resources to ensure their fitness for use.
- ✓ Planning: Making informed decisions regarding the use and management of water resources, taking into account future needs.

By applying water stewardship principles, we can ensure the sustainable use of this precious resource for current and future generations.

Conditions for rational water use on the university premises:

To ensure efficient use of water resources, our university is installing water-saving fixtures, such as low-flow showerheads and faucets, in all

campus buildings. Introduction of rainwater harvesting systems for irrigation and other non-potable purposes.

Use of drip irrigation and other water-saving methods on campus.

Monitoring and maintenance of plumbing systems is done regularly to detect and repair leaks.

Develop and implement a campus water management plan that defines water management goals and strategies.

Establishing standards and guidelines for the sustainable use of water in all campus operations.

Integrate water management principles into curricula and experiential learning opportunities.

Conducting seminars and trainings on rational water use for students, teachers and staff.

Conducting competitions and events to encourage students and employees to implement water-saving practices.

In addition to these activities, the university can also collaborate with local communities and schools to promote water stewardship on a broader level.

Protection of aquatic ecosystems

Protecting aquatic ecosystems is critical to maintaining the health and well-being of people and the planet. Aquatic ecosystems such as rivers, lakes, wetlands and coastal areas provide a range of important services, including:

- ✚ Fresh water supply: Aquatic ecosystems are the main source of fresh water for drinking, agricultural and industrial needs.
- ✚ Climate regulation: Aquatic ecosystems sequester carbon, regulate temperature, and influence precipitation.
- ✚ Supports Biodiversity: Aquatic ecosystems are home to a diverse range of plants and animals, many of which depend on the aquatic environment for their survival.
- ✚ Supporting livelihoods: Aquatic ecosystems support fishing, tourism and other economic activities.

Aquatic ecosystems are threatened by numerous factors, including:

- ✚ Pollution from industrial runoff, agricultural runoff, and household waste can harm aquatic organisms and their habitats.

- ✦ Excessive use of water for irrigation, industry and domestic use can lead to depletion of water resources and degradation of aquatic ecosystems.
- ✦ Climate change is increasing water temperatures, changing precipitation patterns and increasing the frequency and intensity of extreme weather events, all of which negatively impact aquatic ecosystems.
- ✦ Land use changes such as development and deforestation can lead to habitat loss, fragmentation and disruption of water flows.
- ✦ Invasive species can compete with native species for resources and alter the structure and functioning of aquatic ecosystems.

Protecting aquatic ecosystems requires a comprehensive approach that includes:

Water resource management: Sustainable water resource management, including conservation and restoration measures, is critical to protecting aquatic ecosystems.

Pollution Control: Strict control of pollution from industrial, agricultural and domestic sources is necessary to protect aquatic ecosystems.

Habitat Conservation: Protected areas such as national parks and wildlife refuges play an important role in conserving habitat for aquatic species and maintaining the health of aquatic ecosystems.

Ecosystem restoration: Restoring degraded aquatic ecosystems, such as wetland restoration and coastal reconstruction, can help restore their function and value.

Raising awareness and education: Raising awareness of the importance of aquatic ecosystems and measures to protect them is critical to gaining public support and behavior change.

By protecting aquatic ecosystems, we protect the vital ecosystem services they provide and ensure the health and well-being of future generations.