



S.Seifullin Kazakh Agro Technical Research University (onwards S.Seifullin KATRU):

- understand the responsibility of higher education institutions for training specialists with the competence and ability to carry out production activities in compliance with the requirements of environmental legislation of the Republic of Kazakhstan;
- to understand the influence of higher education institutions on the formation of environmental awareness not only of students and staff, but also of their close circle of friends;
- taking into account the availability of powerful educational tools and scientific developments, S.Seifullin KATRU has developed this Strategic Plan for Reducing the Negative Impact on the Environment “NET ZERO”, which declares the following:
 - the need to adhere to the concept of sustainable development in the implementation of its operational activities;
 - the formation of an environmentally responsible scientific community and the popularization of an ecological lifestyle;
 - an emphasis on scientific research in the field of environmentally friendly technologies;
 - the search for ways to mitigate the negative effects of climate change in all areas of the economy;
 - pioneering solutions in the practical implementation of the ZEROWAST approach in a higher education institution;
 - the development of practical cases for the implementation of low-waste technologies for small and medium businesses;
 - the adaptation of environmental solutions for territorial communities in the field of reducing solid household waste.

This document provides for the actions of S.Seifullin KATRU on the path to Zero-waste by 2050, as well as a reduction in the negative impact on the environment by 30% by 2040.



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Environmental education is understood as a viable activity of the most effective ways of educational system and training process, based on the harmony of human society and nature.

A special place is given to the upbringing of a new generation, humane, with a high level of environmental education and culture, capable, along with the effective use of the environment and natural resources, to protect, safeguard, and cherish natural riches.

The relevance of environmental issues and the search for optimal solutions is evidenced by a number of official documents, in particular, "On Ratification of the United Nations Framework Convention on Climate Change" (1995), the Law of the Republic of Kazakhstan "On Education" (2007), the Strategic Program of the Republic of Kazakhstan "Kazakhstan-2050" (2012), the Law of the Republic of Kazakhstan "On Environmental Protection" (1997), the Law of the Republic of Kazakhstan "On the Accession of the Republic of Kazakhstan to the Convention on the Protection and Use of Transboundary Watercourses and International Lakes" (2000), the Concept of Environmental Education of the Republic of Kazakhstan (2002), "The Concept of Environmental Education of the Republic of Kazakhstan", approved by the Ministry of Education and Science of the Republic of Kazakhstan (2002), "On the Sectoral Program "Drinking Water" for 2002-2010" (2002), "The Concept of Environmental Safety of the Republic of Kazakhstan" (2003), "Water Code of the Republic of Kazakhstan" (2003), "Land Code of the Republic of Kazakhstan" (2003), "Forest Code of the Republic of Kazakhstan" (2003), Law of the Republic of Kazakhstan "On the accession of the Republic of Kazakhstan to the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal" (2003), Law of the Republic of Kazakhstan "On Environmental Expertise" (2007), Law of the Republic of Kazakhstan "On Rural Consumer Cooperative of Water Users" (2003), "Ecological Code of the Republic of Kazakhstan" (2007, 2021), "On the Concept of Development and Placement of Specially Protected Natural Areas of the Republic of Kazakhstan until 2030" (2010), Law of the Republic of Kazakhstan "On Subsoil and Subsoil Use" (2010), "On the Concepts of Public and Environmental Security of the Republic of Kazakhstan" (2011).



The starting point of higher environmental education at S.Seifullin KATRU is the continuation of basic secondary education at the next, higher level with the aim of developing high environmental culture, deep environmental knowledge and biosphere worldview in students, training bachelors, specialists and masters in all areas of environmental practical, educational and scientific activities. Today, S.Seifullin KATRU has educational programs that are directly related to the graduation of specialists in the field of ecology, environmental protection technologies, creation of low-waste technologies and energy-efficient processes:

- 6B052 Environment (first level).
- 6B05202 Agroecology (first level).
- 7M04102 SARUD Sustainable Agriculture and Rural Development (first and second level).
- 7M05102 Plant Biotechnology (first and second level).
- 7M07304 Land Management (first and second level).
- 7M08101 Field Crop Breeding (first and second level).
- 7M08104 Phytosanitary Monitoring (first and second level).
- 7M08107 Agropedology and Plant Nutrition (first and second level).
- 7M08111 Agrobiotechnology (first and second level).
- 7M08301 Forestry and Park Management (first and second levels of education).
- 7M08304 Rational Use of Natural Bioresources (first and second levels of education).

- 7M08307 Sustainable Management of Natural Resources (first and second levels of education).
- 7M08701 Precision Agriculture (first and second levels of education).
- 7M08705 Energy Supply and Automation of Agriculture (first and second levels of education).
- 8D08102 Organic Farming (first, second and third levels of education).
- 8D07101 Renewable Energy (first, second and third levels of education).
- 8D08301 Sustainable Management of Forest Resources (first, second and third levels of education).
- 8D08302 Wildlife (first, second and third level of education).

The curriculum of KATIU named after S. Seifullin for non-ecological specialties at the bachelor's level provides for a course in ecology, including the necessary theoretical and practical aspects. Ecological aspects are taken into account in qualifying scientific papers from the master's level to the doctoral dissertation, as well as in all other studies.



Dissemination of knowledge about the concept of sustainable development among students and teachers of S.Seifullin KATRU, as well as the youth of Astana is a priority task of environmental education.

S.Seifullin KATRU provides specialized disciplines covering key aspects of environmentally sustainable development. Among them: Ecology and Sustainable Development (The course is aimed at studying the relationship between natural systems and socio-economic processes, with an emphasis on the development of sustainable development strategies), Ecology and Fundamentals of Life Safety (Students study environmental factors affecting human safety and ways to minimize the risks associated with the impact of negative environmental factors). These courses are aimed at training specialists who are able to solve modern environmental problems and implement the principles of sustainable development in various industries. Our approach includes both a theoretical base and practical classes, which makes the training as practical and useful as possible.

Every year, more than 500 students of non-ecological specialties receive basic knowledge on environmental protection, the concept of sustainable development and conscious consumption. Teachers and students of the Department of Ecology of the Faculty of Forestry, Wildlife and Environment regularly take part in international and national scientific events dedicated to the implementation of the concept of sustainable development (conferences, webinars, internships and exchange programs). They also initiate educational events for schoolchildren, the purpose of which is to draw attention to environmental problems of our time (annual competition of works on environmental topics for schoolchildren), to show the possibilities of recycling materials for counterfeiting (master classes).



Scientific developments in the field of sustainable development and their implementation

Scientific research conducted at the university is aimed at sustainable development and trends in the decarbonization of social activities. Scientific work is being implemented and planned on promising areas of using alternative energy, energy and resource efficiency, improving the impact of transport on the environment and environmental innovations, etc. Considerable attention is paid to cooperation with scientists from other educational and scientific institutions, experts, practitioners, and joint scientific research and publications are envisaged. Together with teachers, university scientists hold scientific and scientific-practical conferences, the topics of which are the problems of the present and future of energy and the environment, ways to reduce the carbon footprint resulting from various types of human activity. A significant role in solving environmental problems is given to the activities of the Research Center for Environmental Sustainability (RCES) of S.Seifullin KATRU – <https://kazatu.edu.kz/ru/pages/universitet/ustojcivoe-razvitie-katiu>.



Scientific developments in the field of sustainable development and their implementation

The availability of a laboratory base and highly qualified scientists contribute to the development of research in the field of ecology and the search for new solutions for technical areas of environmental protection. The activities of the "Research Center for Environmental Sustainability" are aimed at developing research to ensure environmental sustainability in the context of global climate change. It is well known that in the context of increasing man-made stress on the environment, especially on the agricultural sector, issues of maintaining environmental sustainability have become more relevant than ever.

In this regard, the "Research Center for Environmental Sustainability" is currently working in a number of important areas, in particular:

- organizing and developing research projects with participation in MNVO competitions for grant and program-targeted financing in priority areas of fundamental and applied research;
- implementing national and international projects;
- forming creative teams from among leading scientists of departments and related scientific organizations with the involvement of students, master's students and doctoral students;
- participating in the formation of programs and methods of scientific research in the field of environmentally sustainable development and monitoring their implementation;
- active involvement of students, graduates of master's and doctoral programs in the implementation of conducted research after graduation from the university in order to strengthen the human resources of KATRU;
- ensuring integration with scientific institutions and universities of the republic and foreign countries;
- assistance in the promotion of advanced scientific achievements and the implementation of scientific research results in the national economy and the educational process;
- organization of scientific and industrial conferences, seminars, meetings, provision of consulting services, training and retraining of personnel in the field of environmentally sustainable and low-carbon development.



Participation of the university community in the country's reconstruction plans

The university community is stepping up efforts to restore Kazakhstan and achieve climate goals aligned with economic development and environmental needs. Each employee and student in the education sector feels responsible for the present, which shapes the future, and directs efforts to activities to restore and develop the country. The objectives of the educational sphere include training highly qualified graduates who are able to solve the issues necessary in the course of development within the framework of their specialization. Master's and doctoral programs in all educational programs and levels of training provide for the study of engineering aspects of operations to achieve the goals of sustainable development and decarbonization in the country. Particular attention is paid to research conducted by scientists in departments and specialized centers. Scientific work is carried out and planned, coordinated or related to the areas of the State Programs of Kazakhstan. The most important areas of innovative activities of the university are the renewal of agro-industrial capacities using advanced technologies, environmental modernization of the agricultural and energy sectors, environmental monitoring of agricultural lands and other natural resources. Teachers and students of environmental education pay attention to environmental education and informing the population about the peculiarities of climate problems and sustainable development of the region during the recovery period. At the same time, along with this, it is important for the university community and students of education to know energy-saving behavior in the workplace and in everyday life.



The S. Seifullin KATRU has adopted an Action Plan to reduce carbon dioxide emissions by 2050, which includes the following activities: inventory and analysis of current energy consumption and greenhouse gas emissions; development of growth forecasts for university-owned facilities and baseline energy demand and greenhouse gas emissions; identification of options and costs for various levels of energy efficiency in all university-owned buildings, demand-side energy savings at our existing facilities.



The following activities are planned at S.Seifullin KATIU:

Technical activities (installation of water-saving equipment: modernization of the water supply system: elimination of leaks; regular inspection and repair of communications; installation of water meters in each building).

Educational and awareness-raising activities (information campaigns among students and staff, i.e. posters, stands, electronic boards with tips on water conservation; holding a "water week" or eco-days; introducing water resources into educational and curricular programs, such as student research projects on water conservation; competitions and initiatives).

Research activities (conducting research on hydrology, urban studies and sustainable water use; partnership with environmental organizations and industrial enterprises for pilot projects).



The following events are planned at S. Seifullin KATIU:

Technical events

Thermal insulation of buildings: insulation of walls, roofs, floors, attics and basements; replacement or sealing of windows and doors (installation of double-glazed windows); use of heat-reflecting films and insulation.

Modernization of heating systems: balancing of the heating system.

Heat recovery: installation of ventilation systems with recuperation.



This will allow S.Seifullin KATRU to ensure sustainable development in the long term, while implementing educational activities for sustainable development:

- integrating the principles of sustainable development into its activities;
- conducting an analysis of activities and risk control in the context of economic, environmental and social components of sustainable development
- learning and teaching: training students, developing students' skills and motivation to understand the Sustainable Development Goals and implement them in their activities.



The Department of Ecology of the University plans to conduct research work on the processing of agricultural and solid household waste. In particular: processing of bread and bakery waste, processing of fallen leaves and tree branches, as well as identifying sources of formation, collecting paper waste and processing it. Based on the results of these studies, it is planned to create start-ups with the participation of students and use the manufactured products for the university's own needs. In addition, for the purpose of environmental education, raising awareness and changing the mentality of young people in waste collection, it is planned to organize a system for separate collection of waste generated in the university dormitories.



Professional knowledge, skills and climate culture of students play an important role in the implementation of long-term measures to combat climate change. Activities on these issues are the focus of student self-government, which is called upon to be a leader among young people initiating events and making decisions on the university's climate policy. The areas of student self-government concern both education and scientific research, as well as educational activities and housing and everyday behavior.

The problems of climate change and measures to combat changes are becoming a traditional topic of work of scientific societies that unite students of different specialties who are not indifferent to the environment. Thus, since 2009, the student scientific circle "Ecological Club "Ecolife" has been operating at S.Seifullin KATRU, the purpose of which is to unite students, graduate students and teachers for in-depth study of ecology, conducting scientific research and creating and further implementing start-up projects. The club promotes environmental protection measures, the implementation of student research work, various environmental campaigns.

https://www.facebook.com/groups/874676770961372?locale=ru_RU.

The tasks of the student environmental club "Ecolife":

- Promoting students' social activities in the field of environmental protection, including through volunteering and environmental events;
- Participation in scientific conferences and seminars, conducting students' research work;
- Organization of competitions and olympiads in the field of environmental protection;
- Conducting round tables, meetings, debates, creative evenings;
- Promoting the club's activities in social networks;
- Conducting socially significant events in cooperation with environmental organizations.



At their meetings, student scientific societies discuss new "green" technologies, study the most important local environmental problems and look for ways to overcome them, invite interesting lecturers, promote informal communication between participants and implement environmental, educational and social projects.

The range of interests concerns expanding knowledge about environmental and climate problems of the region, including those caused by the war, and research activities to develop practical proposals for solving urgent problems. Involving active communities formed in dormitories in climate problems allows for a more effective behavioral effect of energy conservation and water use. The students' initiative extends to the desire to increase the area of dormitories and careful care of plants, which is a recognized fact in measures to prevent climate change. The trend towards using bicycles and scooters as a relevant means of transport, which corresponds to the city's bicycle infrastructure, is associated with students' climate awareness. To a certain extent, the relevance and novelty of students' scientific work can be assessed based on the results of their participation in environmental Olympiads and scientific competitions in the field of environmental protection.



The academic buildings and dormitories of S.Seifullin KATRU are located on the right bank of the Ishim River, in the Sary-Arka district of Astana, at the address: Zhenis Ave. 62. Since the territory where the university is located was previously considered the center of the old city, many representatives of flora and fauna (representatives of the avifauna and entomofauna) have been preserved. Here, mainly species of dendroflora (trees and shrubs) are found. There are many green spaces on the territory of the university. Representatives of dendroflora include Semenov's maple, Scots pine, Siberian pine, Siberian spruce, silver birch, smooth elm, common aspen, narrow-leaved oleaster, small-leaved linden - suitable for the climatic conditions of the city. In connection with the city becoming the capital of the state, many introduced species appeared among the green spaces, mainly deciduous tree seedlings, including oak, currant, dogwood, cherry, blueberry, elm and others.

Trees and shrubs specially selected for the local climate are actively planted on the territory of the university. Among them, you can find such species as poplar, birch, mountain ash and various varieties of shrubs that not only decorate the territory of the university, but also help improve air quality. These plants play an important role in creating a comfortable environment, providing shade and protection from the wind.

Since the monument to A. Moldagulova, the Zhastar theater, clinics and hospitals are located near the territory of the university, the area is popular with city residents and guests of the capital.



In order to popularize conscious consumption, raise public awareness of the concept of sustainable development, green technologies, reuse and upcycling, S.Seifullin KATRU cooperates with environmental organizations of Astana and the Republic of Kazakhstan in the following departments and organizations:

- 1) The Ministry of Ecology and Natural Resources of the Republic of Kazakhstan - seminars on environmental law for students, teachers and all interested parties
- 2) RSU "Department of Ecology for Astana of the Committee for Environmental Regulation and Control of the Ministry of Ecology and Natural Resources of the Republic of Kazakhstan - seminars on environmental regulation and control
- 3) Environmental organization "Zhasyl EI" - attracting students to the organization's initiatives.
- 4) Media Center of Astana, where teachers of the department systematically give comments on current environmental issues, problems and solutions for the media.