«ҚАЗАҚ ҰЛТТЫҚ АГРАРЛЫҚ ЗЕРТТЕУ УНИВЕРСИТЕТІ» КОММЕРЦИЯЛЫҚ ЕМЕС АКЦИОНЕРЛІК ҚОҒАМЫ

НЕКОММЕРЧЕСКОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО «КАЗАХСКИЙ НАЦИОНАЛЬНЫЙ АГРАРНЫЙ ИССЛЕДОВАТЕЛЬСКИЙ УНИВЕРСИТЕТ»

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Institutional report

Evaluating the Contributions of the Faculty of Agrobiology to Climate Change Mitigation and developing impactful university's programs on climate change

TO: University Leadership, Administrative Council for Sustainable Development
DATE: July 2, 2026
SUBJECT: Comprehensive Audit of KazNARU's Educational and Research Impact on Climate Change

REPORTING PERIOD: 2025–2026 Academic Years

Introduction:

Aligning Agrarian Science with Global Climate Action

In the framework of international higher education standards, KazNARU assess how higher education institutions translate environmental theory into measurable ecological outcomes, particularly under the key categories of Energy and Climate Change (EC) and Education and Research (ED).

For the Kazakh National Agrarian Research University (KazNARU), the Faculty of Agrobiology serves as the primary scientific engine driving institutional compliance with these metrics.

Climate change presents severe multi-dimensional risks to Central Asia, characterized by progressive moisture deficits, accelerating soil erosion, and shifting biodiversity dynamics. Faculty managers at the Faculty of Agrobiology have systematically re-engineered their administrative, educational, and scientific portfolios to address these regional vulnerabilities. This strategic report analyzes how the faculty's multi-disciplinary academic tracks, precision field technologies, and high-impact international research networks collectively mitigate climate change while strengthening KazNARU's global institutional footprint.

Core Pillars of Climate Mitigation and Research Excellence

1. Climate-Resilient Agronomy & Crop Adaptation Under Moisture Deficit

The cornerstone of the Faculty of Agrobiology's scientific agenda is the active modernization of regional crop production to withstand severe environmental

fluctuations. Faculty researchers manage advanced field trials focused on the genetic and physiological adaptation of agroecosystems to global warming.

Through the landmark project "Adaptation of Agroecosystems of Southern Kazakhstan to Global Climate Change," managers have introduced drought-resistant crop varieties and optimized cultivation methodologies designed to thrive under extreme atmospheric stress. These interventions minimize agricultural yield collapse, directly preserving local food security while establishing field-level models of sustainable agrarian adaptation that satisfy the core criteria of global green audits.

2. Carbon Sequestration Modeling & Agroforestry Systems

Mitigating greenhouse gas emissions requires advanced environmental monitoring and carbon accounting frameworks. The Faculty of Agrobiology leads critical ecosystem defense mechanisms through high-altitude field research.

Under the specialized grant "Assessment of Carbon Balance and Sequestration Potential of Forest Massifs of the Ile-Alatau National Park," faculty scientists deploy cutting-edge satellite monitoring and GIS mapping to calculate the exact spatial capacity of regional forests to absorb CO_2. By turning raw botanical data into verifiable carbon capture metrics, the faculty positions KazNARU as a vital national contributor to global climate modeling, reinforcing the university's environmental accountability profile.

3. Precision Agriculture & Digital Soil Degradation Mapping

Unchecked pasture degradation and topsoil desertification significantly exacerbate localized thermal amplification. Faculty managers have confronted this challenge by integrating advanced tech toolkits into field-level rangeland management.

The faculty's specialized initiative, "Development and Implementation of Smart Technologies in Monitoring Degradation of Near-Farm Pastures," utilizes drone-assisted remote sensing to generate real-time digital maps of soil erosion. By applying these precision agriculture frameworks, the faculty prevents sub-surface soil degradation, preserves localized water retention capacities, and provides regional farmers with actionable tools to combat climate-induced desertification.

4. Interdisciplinary Curricula & Climate Literacy Transformation

True institutional sustainability cannot exist without dismantling traditional academic silos. Faculty managers have systematically upgraded standard agricultural syllabi into multi-modal, eco-centric educational paths.

In close alignment with UN Sustainable Development Goal 13 (Climate Action) and SDG 4 (Quality Education), the faculty has embedded mandatory modules covering climate risk analysis, green economics, and carbon accounting across all Bachelor's, Master's, and PhD streams. This curricular evolution ensures that over 80% of graduates are fully prepared to enter the workforce as "green collar" specialists, matching the strict employment criteria set by the Atlas of New Professions and Competencies of Kazakhstan.

5. High-Impact Eco-Innovation and Global Citation Strategy

To overcome historical challenges related to localized research isolation, faculty leadership has enforced strict quality thresholds for all academic outputs. Managers have shifted institutional incentives away from raw publication volume to prioritize high-tier international visibility.

All climate-related research generated within the Faculty of Agrobiology is systematically targeted toward top-quartile global scientific journals (Q1/Q2 Scopus). By forcing this strategic transition, the faculty has dramatically improved KazNARU's normalized citation rates and international co-authorship indexes for the publications on climate change and works on developing impactful university's programs on climate change.

6. Stakeholder Knowledge Transfer & Regional Climate Advocacy

The socio-educational footprint of the Faculty of Agrobiology extends far past the physical perimeter of the university campus. Faculty managers have built regional impact ecosystems by establishing open-access knowledge transfer hubs for local agro-businesses, rural communities, and municipal decision-makers.

Through collaborative eco-focused hackathons, climate vulnerability forums, and field-level training workshops, the faculty translates complex laboratory discoveries into practical field solutions for regional stakeholders. This continuous cycle of community engagement transforms the university into a national champion for sustainable rural development and regional environmental defense.

Conclusion: Strategic Horizon 2029 Vision

True academic sustainability is measured by an institution's ability to turn intellectual human capital into practical solutions for planetary preservation. The Faculty of Agrobiology embodies this standard by positioning scientific innovation at the absolute center of KazNARU's global green identity and impactful university's programs on climate change.

As KazNARU advances toward its Strategic Horizon 2029, the Faculty of Agrobiology remains uniquely positioned to spearhead the university's transition from theoretical eco-awareness to verified green infrastructure. By scaling up automated soil-monitoring networks, expanding international research consortia, and training thousands of climate-literate agroscientists, the faculty directly reverses regression trends in global rankings. More importantly, it ensures that KazNARU remains the definitive Central Asian benchmark for inclusive, climate-resilient agricultural education for generations to come.

APPENDIX 1

THE LIST OF EDUCAITONAL PROGRAMS AT THE FACULTY OF AGROTECHNOLOGY AT KAZNARU

Educational program

6B08101 – Agronomy - 2025-2029

6B05104-Bioinformatics - 2024-2028

6B05103-Bioengineering - 2025-2029

7M08101 – Agronomy - 2025-2027

7M08112 - Breeding and seed production of agricultural crops - 2024-2026

8D08101 – Agronomy - 2025-2028

8D08113 – Plant Breeding - 2024-2027

Catalog of elective disciplines

6B08101 - Agronomy 2025-2029

7M08101– Agronomy 2025-2027

8D08101 – Agronomy 2025-2028

6B05104-Bioinformatics - 2024-2028

6B05103-Bioengineering - 2025-2029

8D08113 - Plant breeding 2024-2027

Graduate model

Graduate model 6B08101 Agronomy

Graduate model 7M08101 Agronomy

Graduate model 8D08101 Agronomy

Graduate model 6B05103 Bioengineering

An educational program development plan

6B05101 - Agronomy - 2024-2028

7M05101 - Agronomy - 2024-2028

8D05101 - Agronomy - 2024-2028

6B05104 - Bioinformatics - 2024-2028

6B05103-Bioengineering - 2024-2028

7M08112 - Breeding and seed production of agricultural crops - 2024-2028

8D08113 – Plant Breeding -2024-2028

Practice (practice bases, main partners and dual training)

Agronomy Practice Base

Alumni Association

Work Plan of the Alumni Association

State examination

Crop production

Plant production

Forage production

Breeding and seed production of agricultural crops

Soil science (for online)

State examination 2

Soil protective agriculture

Meadow science

Seed science

Technology of storage of crop products

Educational program

6B08103 – «Horticulture» (Educational program) - 2024-2028.pdf

7M08103 – «Horticulture» (Educational program) - 2024-2026.pdf

8D08103 – «Horticulture» (Educational program) - 2024-2027.pdf

6B08103 – «Horticulture» (Educational program) - 2025-2029.pdf

7M08103 – «Horticulture» (Educational program) - 2025-2027.pdf

8D08103 – «Horticulture» (Educational program) - 2025-2028.pdf

6B08104 – Plant protection and quarantine (Educational program) - 2024-2028.pdf

7M08104 – Plant protection and quarantine (Educational program) - 2024-2026.pdf

8D08104 – Plant protection and quarantine (Educational program) - 2024-2027.pdf

6B08104 – Plant protection and quarantine (Educational program) - 2025-2029

7M08104 – Plant protection and quarantine (Educational program) - 2025-2027

8D08104 – Plant protection and quarantine (Educational program) - 2025-2028

6B08105 - Plant Science and technology (Educational program) - 2024-2028.pdf

Catalog of elective disciplines

Graduate model

Graduate Model.pdf

Alumni Association

The Association unites graduates of all years, faculty members, and partners of the Faculty of Agrobiology.
Its goal is to maintain a connection with the university, promote professional development, and engage alumni in KazNARU's scientific, educational, and innovation projects.

Main objectives:

1. developing the alumni network and sharing experience;
2. mentorship and student support;
3. participation in accreditation and improvement of educational programs;
4. organizing meetings, forums, and joint initiatives with the agribusiness sector.

Join us: https://t.me/+ODrXc1mVeEQ1Mjdi

An educational program development plan

HORTICULTURE (DEVELOPMENT PLAN FOR THE EDUCATIONAL PROGRAM) - 2024-2028.pdf

Practice (practice bases, main partners and dual training)

Practice

Alumni Association

State exam

6B08105 - Plant Science and technology

Seed production

Plant genetics

Technology of Storage of Fruit and Vegetable Products
Technology of Fruit and Vegetable Cultivation

State Exam 1

Fundamentals of entomology

Modern developments in greenhouse production

Microclonal propagation of fruit and vegetable crops

Fundamentals of phytopathology

Educational program

6B05204 - Ecology (Educational program) - 2024-2028

6B08102 – Soil Science and Agrochemistry (Educational program) - 2024-2028

6B08107- Agroecology (Educational program) - 2024-2028

6B05201 – Ecology (Educational program) 2025-2029

6B08102-Soil Science and Agrochemistry 2025-2029

7M05204- Ecology (Educational program) - 2024-2026

7M08102 – Soil Science and Agrochemistry (Educational program) - 2024-2026

7M05204-Ecology (Educational program) 2025-2027

7M08102 – Soil Science and Agrochemistry 2025-2027

8D05204- Ecology (Educational program) - 2024-2027

8D08102 – Soil Science and Agrochemistry (Educational program) - 2024-2027

8D05204 -Ecology (Educational program) 2025-2028

8D08102 Soil Science and Agrochemistry 2025-2028

Catalog of elective disciplines

7M05204-Ecology 2025-2027

8D05204-Ecology 2025-2028

6B08102-Soil Science and agrochemistry 2025-2029

7M08102-Soil Science and agrochemistry 2025-2027

8D08102-Soil Science and agrochemistry 2025-2028

Graduate model

Soil science

Agroecology

6B05201 – Ecology

7M05204-Ecology

6B08102- Soil science and agrochemistry

7M08102- Soil science and agrochemistry

8D08102- Soil science and agrochemistry

An educational program development plan

Agroecology 2024-2028

Ecology 2024-2028

Development Plan 6B05201- Ecology

Practice (practice bases, main partners and dual training)

Alumni Association

Voluntary union of alumni, established on the basis of shared professional and ethical principles, aimed at fostering unity among graduates

The Mission of the Association - to unite graduates of all generations from the specialty to create a community that fosters the further development and prosperity of the department

The goals of the Association

- Development of contacts between alumni members of the Association;
- Providing assistance to graduate students on employment issues;
- Promoting the preservation and development of the best traditions of the department.

Director for institute for green and sustainable development **R. Abazov**