APPROVED

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«30» 10 2024 y.

Program

«Eco-University 2035»

Semey 2024

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Content

Introduction

The "Eco-University 2035" program aims to integrate principles of sustainable development and environmental responsibility into all aspects of the institution's operations. In the face of global environmental challenges such as climate change, resource depletion, and environmental degradation, universities play a key role as centers of education, research, and social engagement.

Deadline for completion of tasks - January 1, 2035

Objective

To transform the university into a model of ecological sustainability, reducing its environmental footprint and ensuring responsible resource use. This includes optimizing internal infrastructure, fostering behavioral changes among students, faculty, and staff, and actively engaging in addressing environmental issues on regional and global levels.

Section 1. 3R (Reduce, Reuse, Recycle)

Goals:

1. Reduce the volume of waste generated at the university.
2. Increase student awareness of sustainable consumption principles.
3. Build an active community that supports environmental initiatives.

Implementation Methods:

Proposal	Description
Document Digitization	Transition to electronic study materials and documents to reduce paper usage. Create an online platform for sharing notes and textbooks.
Educational Workshops	Conduct lectures and workshops on consumption reduction (avoiding single-use items, using reusable bottles and bags).
Plastic-Free University	Introduce a system for selling reusable bottles and installing water refill stations across the campus.
Campus Swap Meets	Regular events where students can exchange clothing, books, and other items. Create a permanent swap corner on campus.
Reusable Containers	Implement a reusable container system in dining areas, encouraging students to use their containers to reduce single-use plastics.
Creative Workshops	Organize workshops on repurposing old items (clothing, furniture) into new items.
Waste Sorting	Install designated sorting bins (paper, plastic, glass) around the campus with clear instructions for use.
Educational Campaigns	Run campaigns to inform students about recycling and waste sorting.
Partnership with Recycling Companies	Collaborate with local organizations for regular recyclable materials collection.

Outcome Evaluation:

1. Collect data on waste volumes before and after program implementation to assess effectiveness.
2. Conduct surveys to gauge student awareness of 3R principles and involvement in the program.
3. Publish reports on the program's achievements.

Section 2. Reducing Plastic and Paper Use at the University

Goals:

1. Decrease disposable plastic and paper consumption on campus.
2. Raise awareness among students and staff about plastic and paper-related issues.
3. Integrate sustainable practices into daily university life.

Implementation Methods:

Proposal	Description
Plastic Reduction	Reusable Bottles: Introduce a reusable bottle program with water refill stations throughout the campus. Ban Single-Use Utensils: Transition to reusable containers and utensils in cafeterias and offer discounts for students who bring their containers. Plastic-Free Day: Organize special days for students and staff to participate in activities without using plastic products.
Paper Reduction	Digital Materials: Transition to digital textbooks, assignments, and documents. Set up online platforms for material sharing. Printing Devices: Configure printers for double-sided printing by default and implement volume control for printing.
Awareness Raising:	Informational Campaigns: Develop online content on the effects of plastic and paper use and ways to reduce consumption. Student Initiatives: Encourage students to create their projects and initiatives to reduce plastic and paper use. Competitions and Awards: Host contests to reward the best solutions for reducing plastic and paper among students and staff. Educational Workshops: Hold lectures and workshops on the harm of single-use plastic and its impact on the environment.

Outcome Evaluation:

1. Gather data on paper and plastic usage before and after program implementation.
2. Conduct surveys among students and staff to measure awareness and behavioral changes.
3. Publish reports on achievements and program events focused on plastic and paper reduction.

Section 3. Water Conservation

Goals:

1. Reduce water consumption by 20% over 10 years.
2. Increase the use of secondary water sources by 15% over 10 years.

Implementation Methods:

Proposal	Description
Infrastructure Optimization:	Water-Saving Devices: Install aerators on faucets and showers, sensor-based faucets, and dual-flush toilets. Implement graywater recycling systems for irrigation or technical needs. Repair and Replacement: Address leaks and replace outdated pipes and water supply systems.
Awareness and Training:	Informational Campaigns: Place posters and signs on campus explaining the importance of water conservation. Share information via emails, social media, and the university website. Training for Staff and Students: Offer seminars and lectures on water efficiency and conservation, integrating water-saving topics into courses on ecology and sustainability.
Efficient Water Management Systems:	Water consumption monitoring system: Installation of water meters with automatic data collection that will monitor consumption in real time and promptly identify leaks or excessive consumption. Regular inspections**:** Introduction of routine inspections and testing of all water systems for leaks and inefficient use.
Encouragement and participation of students	Introducing programs to motivate students to actively participate (e.g., competitions to develop water-saving ideas, awarding active program participants). Stimulating student initiatives to improve the environmental situation on campus.
Use of innovative technologies	Installation of rainwater harvesting systems for technical needs (e.g. lawn watering). Use of water filtration and reuse systems to minimize wastewater discharge.

Evaluation of results

1. Measurement of water consumption: regular monitoring of the amount of water used on campus (monthly, quarterly, or annually).
2. Comparing current consumption volume to a baseline (prior to implementation of the water conservation program) to assess progress.
3. Identification of specific areas with the highest water use (e.g., laboratories, dormitories, athletic facilities).
4. Estimating the percentage of water reused (e.g., for watering green areas or cleaning) as a percentage of total consumption.
5. Leakage monitoring: number of leaks detected and repaired as a result of a water supply audit.
6. Surveys and questionnaires to assess changes in student and employee behavior after implementation of water conservation education programs.
7. Comparison of water supply costs before and after implementation of water conservation measures.
8. Comparison of the university's water consumption indicators with similar universities participating in water-saving programs.

Section 4. Water Reuse at the University

Goals:

1. Reduce the consumption of fresh water at the university.
2. Minimize wastewater discharged into the sewage system.
3. Raise awareness among students and staff about water conservation and efficient use.

Implementation Methods:

Proposal	Description
Rainwater Collection Systems	Installation of rainwater harvesting tanks on the roofs of administrative and academic buildings, laboratories and dormitories. Using rainwater to water plants on campus. Integration of rainwater systems into sanitary facilities (e.g., use of rainwater for toilet flushing cisterns). Regular cleaning and maintenance of systems to prevent contamination of collected water.
Gray Water Reuse:	Collection of gray water from showers, kitchens and sinks in dormitories and sports facilities. Installing filtration and treatmentsystems to treat graywater to make it safe for reuse. Using treated graywater for irrigation and cleaning of campus grounds and technical needs such as washing street surfaces. Regular monitoring of water quality to ensure it is safe for reuse.
Laboratory wastewater treatment system	Installation of wastewater treatment systems for laboratories where contaminants can be separated. Treatment of laboratory wastewater using filters and safe chemical reactions to make the water suitable for technical needs. Safe storage of chemicals to prevent their accidental release into water effluents.
Educational and information programs	Organizing lectures, seminars and workshops on water reuse and sustainable water management issues Establishment of an incentive system for

	students and staff involved in water saving projects Information campaigns and posters in hostels, academic buildings and campus on the importance of water conservation and water reuse opportunities Involvement of students in projects and research on water management, development and improvement of filtration systems and gray water use
Modernization of plumbing and infrastructure	**Integration of a water recovery system** in dormitories and educational buildings to redistribute collected rainwater and graywater.

Outcome Evaluation:

1. Aim to reduce fresh water use by 20-30% within the first three years.
2. Minimize wastewater discharged into the sewage system.
3. Increase awareness and participation among students and staff in water reuse practices.

Section 5. Water Pollution Control at the University

Goals:

1. Regularly test water from drinking fountains, kitchens, laboratories, and nearby water bodies.
2. Analyze water quality indicators, including pH levels, heavy metal content, biochemical oxygen demand, nitrate and phosphate levels, and pathogen presence.
3. Create a public reporting system for water quality analysis results.

Implementation Methods:

Proposal	Description
Water Resource Management:	**Installation of** filtration systems on water supply systems at key points of the university. **Creation** of a system of rainwater collection and reuse for the needs of the university (watering plants, technical needs). **Modernization of the** sewerage system to prevent leaks and the entry of pollutants into the soil and water bodies. **Development of** a wastewater treatment system for laboratories and technical buildings that use chemicals.
Pollution Prevention:	**Development of** instructions for laboratories on safe use and disposal of chemicals, prevention of their ingress into drains. Spill and leakage control **system** (monitoring of chemical storage sites, regular equipment inspections).
Education and outreach programs	**Seminars** and lectures for students and staff on sustainable water management and pollution prevention issues **Involvement of students in scientific projects on water quality research and development of treatment methods**
Cooperation with local organizations	**Partnership** with local environmental organizations to jointly monitor and improve water quality in the region. **Collaboration** with municipal water utilities to jointly analyze water quality and share data. **Organization of** environmental events

	(cleaning of coastal zones, actions on water bodies restoration) with the participation of students and local residents.

Evaluation of results

1. Regular improvement of water quality indicators compared to previous periods;
2. Decrease in the volume of pollutants in the university wastewater;
3. Increased awareness and participation of students and staff in the initiative.

Section 6. Smart Building

Goals:

1. Increase energy efficiency and reduce building operational costs.
2. Improve comfort and safety for students and staff.
3. Ensure ease of space management and access to information.

Implementation Methods:

Proposal	Description
Smart Management Systems:	Automated Lighting: Install sensors to adjust lighting based on natural light and room occupancy. Smart Heating and Cooling: Implement systems that automatically adjust temperature based on the time of day and room occupancy.
Energy Efficiency:	Energy Consumption Monitoring: Install sensors for real-time energy tracking to identify and eliminate inefficient practices. Solar Panels: Develop and implement a solar panel installation project on building rooftops to reduce electricity costs.
Safety and Access Control:	Surveillance Systems: Install modern cameras and monitoring systems to enhance campus security. Access Control: Implement electronic access cards for students and staff to control access to specific areas.
Convenience and Interactivity:	Mobile App: Develop an app for students to manage lighting, temperature, and other systems, and access information about available resources (e.g., classrooms, equipment). Interactive Panels: Install information panels in lobbies displaying schedules, available rooms, and events.
Educational Programs	Seminars and workshops: Conducting training events on the use of smart building technologies and their impact on sustainable development Student projects: Encourage students to develop their own solutions to improve smart building performance (e.g. start-ups, energy efficiency projects).

Outcome Evaluation:

- Collect data on energy consumption, comfort, and safety before and after implementing the program.
- Conduct surveys to assess student and staff satisfaction and improvements in comfort.
- Publish reports on achieved results and suggestions for further improvements.

Section 7. Smart Parking

Goals:

1. Optimize the use of parking spaces.
2. Reduce the use of personal vehicles.
3. Introduce a parking reservation system.
4. Increase parking zone safety.
5. Reduce the time spent searching for parking spaces.

Implementation Methods:

Proposal	Description
Encourage Alternative Transport:	Introduce incentive programs for the use of public transport and bicycles. Improve bicycle and pedestrian infrastructure (bicycle parking, sidewalks, safe crossings).
Increase Parking Costs:	Introduction of paid parking or increase in the cost of existing paid parking spaces. Differentiation of parking fees depending on the time of day (cheaper during off-peak hours).
Electronic Parking Management:	Introduction of electronic parking passes with pre-booking. Creation of a mobile application for parking space management (tracking available spaces, reservations).
Parking optimization	Organizing short stop and drop-off areas for passengers to reduce prolonged parking use.

Outcome Evaluation:

- Regularly collect data on transportation methods used by students and staff.
- Evaluate the effectiveness of measures and adjust the program as needed.

Section 8. Reducing Personal Vehicle Usage

Goals

1. Promote alternative transportation options among university staff.
2. Implement incentives for staff to reduce personal vehicle use.
3. Create an information hub dedicated to reducing personal vehicle usage.

Implementation Methods:

Proposal	Description
Incentivizing the use of public transportation	Subsidize public transportation passes for staff.
Development of bicycle infrastructure	**Organizing** convenient and safe bicycle parking lots. **Providing** benefits for employees who use bicycles to commute to work..
Carpooling	**Develop a** mobile app or web platform to organize carpooling among employees and learners. **Encourage** carpooling (e.g., parking discounts or other bonuses for those who give rides to colleagues).
Information campaign	**Conduct campaigns** to raise awareness of the environmental and health impacts of personal transportation. **Publicizing information** about available alternative transportation options and the benefits of using them. **Organizing** "car-free weeks", contests among employees to reduce emissions or competitions to use alternative means of transportation.
Encouragement and recognition of employees	Creating "environmental certificates" for employees who actively participate in the program.

Evaluation of results

1. Develop a system to monitor and analyze program successes (e.g., number of participants, reduction in the number of cars in parking lots).

2. Regular reporting of program accomplishments to all participants to help motivate further participation.

3. Setting long-term goals, e.g., reduce personal vehicle use by 30% within 5 years.

Section 9. Use of Zero-Emission Vehicles at the University

Goals

1. Transition the university's service fleet to electric vehicles.
2. Increase the share of zero-emission vehicles (ZEVs) among university staff to 20% of all vehicles.
3. Increase the number of students and staff using bicycles and electric scooters by 25%.

Implementation Methods:

Proposal	Description
Infrastructure Development for Zero-Emission Vehicles:	Electric Vehicle Charging Stations: Establish a network of charging stations on campus, accessible to students, faculty, and staff. Bicycle Infrastructure: Expand the network of bike paths, install bike parking stations, and ensure convenient access. Electric Scooter and Bicycle Infrastructure: Provide parking and charging stations for these types of transport.
Transition to Zero-Emission Vehicles:	Replacement of University Fleet: Gradually replace the university's service and utility vehicles with electric vehicles or other zero-emission vehicles (e.g., electric buses). Electric Bus Acquisition: Purchase electric buses for transporting students and staff across campus and between distant buildings.
Encouraging ZEV Use among Staff and Students:	Incentives and Benefits for ZEV Owners: Offer benefits such as free or discounted parking, priority access to charging stations, and charging services at special rates. Subsidies and Financial Support Programs: Provide subsidies or financial assistance for students and staff purchasing electric vehicles, electric scooters, or bicycles.
Raising Awareness and Engagement:	Educational Programs and Workshops: Conduct seminars on the benefits of using zero-emission vehicles for students and staff. Events and Campaigns: Organize events (electric vehicle days, bicycle weeks) to promote eco-friendly transportation. Awareness Campaigns: Develop informational content on the environmental and health benefits of reducing transport emissions.

Outcome Evaluation:

1. Increase the percentage of zero-emission vehicles among university staff.
2. Fully transition the university's service fleet to electric vehicles.
3. Increase the number of students and staff using bicycles and electric scooters.

Section 10. Conservation of Genetic Resources for Plants (Flora), Animals (Fauna), and Wildlife for Food Production and Agriculture

Goals

1. Create and maintain a seed and genetic material bank to preserve plant and animal resources.
2. Participate in international programs for exchanging genetic material and knowledge to increase the accessibility of rare species.
3. Integrate the theme of genetic diversity into the educational programs for students in agriculture and biology disciplines.

Implementation Methods:

Proposal	Description
Creation of Genetic Resource Banks:	Seed Bank: Establish and maintain a seed bank for plants, including agricultural crops, rare, and endangered species, to preserve genetic diversity for future agricultural use. Animal Genetic Material Bank: Collect, store, and study genetic material (embryos, DNA) of agricultural animals and wildlife to maintain their genetic base for potential population restoration. Microorganism Storage: Develop a collection of beneficial microorganisms (e.g., fungi and bacteria) that can be used to enhance crop productivity and health in agroecosystems.
Development of Research Laboratories and Nurseries:	Nurseries for Rare and Endangered Species: Create and support nurseries to grow and conserve rare and endangered flora and fauna species, allowing for the study of their biological characteristics and future restoration of wild populations. Research Laboratories for Wildlife and Agroecosystems: Establish experimental fields and research stations to study biodiversity and interactions between wild and cultivated plants, as well as analyze the ecological role of wildlife in agricultural systems.
Database Creation and Genetic Resource Monitoring:	Genetic Resource Database: Compile information and create a digital database of all available plant, animal, and microorganism genetic resources stored in the university's banks or nurseries. Biological Resource Monitoring: Regularly

	monitor the preservation status of genetic resources, and ensure the health of animals and plants held in nurseries and gene banks.
Educational and Research Programs	Educational Programs for Students and Staff: Develop courses and seminars on biodiversity conservation and genetic resources, involving students in conservation projects and genetic material research. Scientific Research and Publications: Conduct studies on genetic resources, their significance for agriculture, and nature conservation, and publish scientific reports and articles to popularize program achievements.
International Cooperation and Genetic Resource Exchange:	Partnerships with International Centers and Gene Banks: Establish connections with international organizations involved in genetic resource conservation for the exchange of seeds, genetic material, and knowledge. Participation in Global Biodiversity Projects: Join international programs and initiatives focused on agro-biodiversity conservation and sustainable agriculture in response to climate change.
Popularization of Genetic Diversity Conservation	Information Campaigns and Events: Organize events, exhibitions, and campaigns to raise awareness about the importance of genetic diversity for food security and ecosystem balance. Community Engagement: Collaborate with farmers, schools, and community organizations to promote genetic resource conservation programs and their significance for agriculture.

Outcome Evaluation:

1. Create and maintain a seed bank.
2. Participate in international programs for genetic material exchange and knowledge sharing to increase the availability of rare species.
3. Include genetic diversity themes in the educational curriculum for all agriculture and biology students.