



NEWSLETTER

ERASMUS+ GREEN PROJECTS IN TURKMENISTAN

Erasmus+ Green Projects in Turkmenistan

Global climate change increasingly impacts on agriculture development, utilization of energy resources and environment, moreover, the continuous growth of the Earth's population raises the most urgent problem: providing humanity with food. From this perspective, the world faces a triple task in the 21st century:

- to feed the growing population
- to do this in an environmentally sustainable way, and
- to cope with the problem of hunger

However, it is impossible to increase the farming production volumes on the old technological basis since this will proportionally require increasing the use of land, water and energy. Precision agriculture is the way to tackle these challenges which could help to increase the efficiency of labour, increase yields, reduce the application of nitrate fertilizers and reduce the cost of cultivation of various crops. Transition to sustainable farming also requires training professionals able to use geospatial technologies and remote sensing technology to collect and analyse necessary information and other new eco activities.

In the framework of Erasmus+ Program two "green" projects have been implemented at five Turkmen universities: NICOPA (New and innovative courses on precision agriculture) since 2018 and GEOCLIK



(New courses on geospatial engineering for climate change adaptation of coastal ecosystems) started in 2021.

The coordinators of three Turkmen institution teams answered our questions on the priorities set and intended actions in projects, the achieved first results, and the prospects of projects efficiency and sustainability.

– What has already been done by the Turkmen team and what are the team further objectives?

Durdyev O., S. Niyazov Turkmen Agricultural University - The main objective of NICoPA is the development and accreditation of BA and MS curricula for training specialists according to the Bologna requirements and the new developments in the field of Precision agriculture.



With the active support of EU partners from Technical University of Berlin and Space Technologies (Berlin), Turkmen partners took part in the upgrading of existing and development and implementation of new curricula. All introduced programs are built on the principles of green economy. On the basis of new and modernised disciplines, students learn to utilize the latest technologies for the efficient use of irrigation water, energy and fertilizers in agricultural production and take practical classes at experimental farms of their universities using the basics of “precision agriculture”, “photogrammetry and the Earth remote sensing” and “geoinformation technologies”.



In the framework of NICoPA, they have traditional lectures and seminars on the sustainable development and climate change topics including laboratory works and applied study of particular issues. We also use case methods for effectively integrating the studied materials and providing our students with skills to analyze and suggest solutions for their effective participation in future in the environmental protection in reality.

The GEOCLIC project involves five EU, three Central Asia countries and Azerbaijan. CA countries are in particular need to have specialists for monitoring

New and Innovative Courses for Precision Agriculture



and managing coastal ecosystems given the region’s vulnerability to natural disasters and climate change.

The goal of the project is the development of new curricula (BA/MA/PhD) and modernization of the current curricula for training specialists in the field of ecology, management and engineering of coastal zones with competencies to use remote sensing tools and geospatial technologies, GIS Software–ILWIS to assess the state of the environment and manage the obtained data in order to implement improvements.

The received developments will help solve the negative consequences of the environmental impact. The project is an opportunity to get closer to solving these problems.

Kurbanov B., Coordinator, Turkmen State Agricultural Institute, Dashoguz (TSAI) – Within the framework of NICoPA, we have been able to acquire the unique innovative equipment and have created virtual classrooms on precision farming and also organized the work of practical laboratories. Along with access to innovative project knowledge and technologies, students can master practical use of data obtained from space satellites.





Applications of NICoPA project technologies will help us manage the natural balance in the region.

The NICoPA developed and modernised academic disciplines have successfully been accredited at the national level which included: Precision agriculture, Soil science, Agrometeorology, Photogrammetry and remote sensing, Geodesy, Hygrometry and Hydrology, Geoinformation systems, Modern geodetic instruments and Climatology.

In 2021 and 2022 NICoPA demonstration workshops were held for teachers and specialists of the Dashoguzsuvhojalyk Association. NICoPA-Plus signed agreements with the Dashoguzsuvhojalyk Association and the Rysgally Atan daň (agricultural enterprise).

– How NICoPA technologies will benefit to achieve sustainable increases in farm productivity and, at the same time, “will not harm” the nature of Turkmenistan?–

Durdyev O. - To increase the agriculture productivity, NICoPA technologies are used during



mechanized works that “spares” the soil during its cultivation, as well as the precise and dosed application of fertilizers, chemicals and herbicides that do not lead to environmental damage, and help preserve the landscape and biological diversity of nature.

Kurbanov B. - Our students currently learn to develop and design a salinity map of TSAI educational facilities using QGIS software (Quantum Geo Information System) in the NICoPA virtual classroom.

As part of the NICOPA project, we also hope to purchase a meteorological station which will enable us to measure various agrometeorological parameters such as solar radiation, level of precipitation, average, maximum and minimum air temperatures, relative humidity, dew point, saturation vapor pressure deficit, average, maximum and minimum wind speed, reference evapotranspiration.

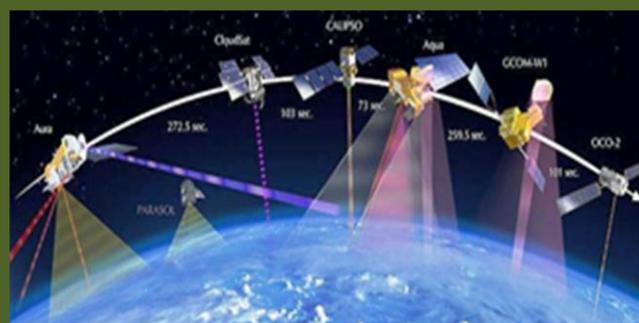
- What contributions to improving the ecological situation in the Caspian Sea are expected in case of GEOCLICK successful implementation?

Ashirmuradova Sheker, Coordinator, Magtymguly Turkmen State University (TSU) - The goal of the GEOCLIC project is to improve the environmental situation and ecosystems through new technologies for the conservation and restoration of the biodiversity of the Caspian region.

The work in project will support developing curricula targeted at training specialists with competences to use remote sensing tools and geospatial technologies in the field of ecology, management and engineering of the coastal zone.



Our students will have opportunities to receive knowledge in digital image processing, big data analysis, environmental modeling and management, optical and hyperspectral remote sensing data, computer vision algorithms, GIS and other technologies.



Implementation of the project tasks will also have effect on the regional aspect, which means that there will be good prospects for cooperation between universities and enterprises in the exchange of knowledge and educational resources, training competitive specialists with analytical and research skills.

Kurbanov B. - We have already the first developments: our students have completed the work on the course projects: "Monitoring of the Khanhovuz reservoir", "Monitoring of the Turkmen lake Altyn



Asyr", "Monitoring of the reservoir 15 Years of Independence", "Monitoring of the Sarykamysh Lake", "Monitoring of the Saryazy reservoir".

Such assessments have currently been carried out by students in order to calculate changes in the water surface area, the volume of reservoirs and other water characteristics.

– **How participation in Erasmus+ projects influence on their participants, particularly, on young teachers?**

Durdyev O. – Erasmus + projects provides opportunities to implement the assigned objectives in the shortest possible time, develop professional competences and intercultural communication skills, work together with colleagues from different countries in multinational consortia.

Erasmus+ supports young participants to moving their carrier forward. Our young teacher Govshut Shadurdyev is one of such optimistic examples, an active participant in both projects NICOPA and GE-CLIC. Govshut expressed a wish to gain deeper knowledge in GIS technologies and Engineering for monitoring water bodies and entered a Master prog-





ram at the Kazakh-German University in the field of “Integrated Water Resources Management”.

Ashirmuradova Sh., TSU - In 2021 academic year, our student Ykhtiyarov Diyar took part and was awarded in the contest organised by the Academy of Sciences of Turkmenistan on the topic "Researching conditions of mudflows origination and ways of their rational use".



In 2022 academic year, TSU students, specialized in ecology, have prepared their research papers for the Contest of young scientists in Turkmenistan on the topics: “The importance of digital mapping and remote monitoring in increasing the productivity of cultivated lands”, “Secondary waste treatment for biogas production”, “Flower decoration of urban spaces and its importance in the development of eco-culture”.



Conclusion

The transition to a "green" economy is one of the priority areas of the economic policy of Turkmenistan which is based on innovative, resource-saving and environmentally friendly technologies

The recently adopted National Strategy for the Development of Renewable Energy in Turkmenistan until 2030, the National Climate Change Strategy and the National Forest Program of Turkmenistan are first steps in this direction. The assistance of Erasmus+ Program is highly important as a complementary tool in the country's reform which enhances the further moving of Turkmenistan and the entire region to sustainable development.





Today, the countries of Central Asia demonstrate high interest and unanimity in a wide range of areas. The practical work initiated in recent years in the five-sided format already proves the enormous potential of joint efforts and close interaction.

Global problems could be met only through cooperative efforts by expanding the cooperation and making the most of engineering, technological and organizational innovations. Project partners can brainstorm effectively to solve problems and become highly motivated to reach the end goal as a team.

The "green" projects of the Erasmus+ Program make a great contribution to the well-being of the region, and their sustainable results serve the interests of Central Asia states and peoples.



FOR MORE INFORMATION

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