

Brief information about the project

Name of the project	AP19680487«Monitoring and management of pasture lands of the Moyinkum sandy massif under the climate change using remote sensing data» (0123PK00582)
Relevance	<p>The requirement to assess the degree of disturbance of arid ecosystems necessitates the monitoring of natural arid pastures in order to generate recommendations and an unified concept for the conservation and restoration of the species composition and soil resource of arid pastures.</p> <p>Historically, the Moyinkum desert was an important pasture area of Kazakhstan, having a sufficient amount of fodder for grazing cattle throughout the year. The vegetation cover of the massif is represented by a significant number of unique plant communities, which include valuable fodder, medicinal, technical and other plants.</p> <p>Occasionally, overexploitation of such areas, fires, deflation, and changes in the condition of grasslands can result in various stages of pasture degradation. Modern mapping technologies and remote sensing methods of the earth make it possible to precisely and comprehensively assess the level of negative changes, the range and dynamics of destructive processes in arid ecosystems, allowing for the subsequent implementation of productivity-enhancing measures.</p> <p>In the desert landscapes of the massif, the problem of transformation of the natural environment and changes in the individual components of ecosystems is acute, resulting in a decrease in pasture productivity and in the diversity of local plant communities, which in turn leads to a decrease in livestock.</p>
Purpose	The objective of this project is to monitor pastures and develop recommendations for the sustainable management of pasture lands on the Moyinkum sandy massif under climate change conditions in order to promote the development of animal husbandry.
Objectives	<ul style="list-style-type: none">- Analysis of theoretical and methodological approaches and methods of satellite monitoring and management of pasture lands of arid territories;- Identification of the trend of climatic changes in the studied region over a multi-year period;- Determination of the dynamics of changes in the area of pastures using remote sensing data of the earth;- Study and selection of modern satellite systems used for remote monitoring of pastures and compilation of catalogues of satellite images in the period from 1980 to 2022.;- Performing field landscape and ecological studies in selected polygons to determine the degree of transformation of the ecosystems of the sandy massif;

	<ul style="list-style-type: none"> - Assessment of changes in the vegetation cover of the region and an integral assessment of the degree of transformation of pasture lands of the sandy massif in the conditions of climate change; - Statistical analysis of the economic activity of objects on pasture lands and assessment of the existing possibilities of pasture resources of the Moyinkum sand massif; - Determination of the degree and extent of degradation of pastures of the sandy massif; - Identification of spatial and temporal patterns of the fire regime of arid landscapes of the Moyinkum sand massif over the past 30 years; - Determine the congestion of pastures according to the established optimal load rate on pasture lands and predict the productivity of pastures of the sandy massif; - To develop maps of pastures (natural forage lands) with different degrees of degradation in a time section (at different times); - Develop maps of environmental protection measures to prevent degradation of pastures of the sandy massif; - Development of recommendations on optimization of pasture nature management and regulation of pasture loads in the conditions of climate change based on remote sensing data and ground-based monitoring systems; - Development of mechanisms for animal husbandry and pasture management of arid pastures (on the example of the Moyinkumsky sandy massif) for sustainable land use in the conditions of climate change based on remote sensing data
<p>Expected and achieved results</p>	<p>for 2023:</p> <ul style="list-style-type: none"> - Theoretical and methodological approaches and methods of satellite monitoring and management of pasture lands of arid territories will be analyzed; - The trends of climatic changes in the studied region over a multi-year period will be revealed; - The dynamics of changes in the area of pastures will be determined using remote sensing data of the earth; - Modern satellite systems used for remote monitoring of pastures and cataloguing satellite images in the period from 1980 to 2022 will be studied and selected; - Field landscape and ecological studies will be carried out in selected polygons to determine the degree of transformation of the ecosystems of the sandy massif; <p>for 2024:</p> <ul style="list-style-type: none"> - An assessment of changes in the vegetation cover of the region and an integral assessment of the degree of transformation of pasture lands of the sandy massif in the conditions of climate change will be carried out; - A statistical analysis of the economic activity of objects on pasture lands and an assessment of the existing

	<p>possibilities of pasture resources of the Moyinkum sand massif will be carried out;</p> <ul style="list-style-type: none"> - The degree and scale of degradation of pastures of the sandy massif will be determined; - The spatial and temporal patterns of the fire regime of arid landscapes of the Moyinkum sand massif over the past 30 years will be revealed; - The congestion of pastures will be determined according to the established optimal load rate on pasture lands and the productivity of pastures of the sandy massif will be predicted; - Maps of pastures (natural forage lands) with varying degrees of degradation in the time section (multi-time) will be developed; <p>for 2025:</p> <ul style="list-style-type: none"> - Maps of environmental protection measures to prevent degradation of pastures of the sandy massif will be developed; - Recommendations will be developed to optimize pasture nature management and regulation of pasture loads under climate change conditions based on remote sensing data and ground-based monitoring systems; - Mechanisms of the system of livestock farming and management of pasture lands of arid pastures will be developed (on the example of the Moyinkum sand massif) for sustainable land use in the conditions of climate change based on remote sensing data,.
<p>Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles</p>	<ol style="list-style-type: none"> 1. Bissenbayeva S.B., PhD, H-Index– 5, Researcher ID O-1121-2014, ORCID: 0000-0002-3770-3143, Scopus author ID: 57210948533. 2. Tokbergenova A.A., Candidate of Geographical Sciences, Associate Professor, H-Index– 2; Researcher ID O-2205-2014, ORCID: 0000-0002-1934-5063, Scopus Author ID: 57202334262. 3. Samarkhanov K.B., H-Index– 6; Researcher ID S-2590-2017, ORCID: 0000-0001-9799-8695, Scopus Author ID: 5719612177 4. Zulpykharov K.B., H-Index– 1; Researcher ID HLG-0490-2023, ORCID: 0000-0002-0275-2463, Scopus Author ID: 5805519840 5. Rakhimova M.S., H-Index– 3; Researcher ID HLF-2207-2023, ORCID: 0000-0002-9873-105X, Scopus Author ID: 57216812283 6. Ryskeldieva A.M., H-Index– 1,; ORCID: 0000-0002-8677-1150, Scopus Author ID: 57190757940 7. TurymtayevZh.ORCID: 0000-0003-4075-6702
<p>List of publications with links to them</p>	
<p>Patents</p>	<p>-</p>