

Brief information about the project

Name of the project	ИПН «Monitoring and management of pasture lands of the Moyinkum sandy massif in the context of climate change using remote sensing data» (AP19680487)
Relevance	The Moyinkum sand massif is administratively located in Southern Kazakhstan, on the territory of the Zhambyl and Turkestan regions. The sandy massif includes the Sozak district of the Turkestan region, Sarysu, Moyinkum, Talas, Zhualynsky, Zhambylsky, Bayzaksky, T. Ryskulov and Merken districts of the Zhabyl region. The total area of massif is 3.75 million hectares. According to the Bureau of National Statistics, 531,075 thousand people (100% rural population) live in the region under study. Natural pasture lands here play one of the main roles in the development of agriculture and the country's economy as a whole. The pasture lands of the studied object are under enormous pressure and land degradation, mainly due to the effects of climate change and climate-related extreme events. Historically, the Moynkum desert has been an important pasture area in Kazakhstan, with sufficient fodder for grazing 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.
Purpose	Мониторинг пастбищ и разработка рекомендаций, механизмов по установившемуся управлению пастбищными угодьями песчаного массива Мойкум в условиях изменения климата с применением данных ДЗЗ для развития животного.
Objectives	- Analysis of theoretical and methodological approaches and techniques for satellite monitoring and management of pasture lands in 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; - 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; - Assessment of changes in the vegetation cover of the region and an integrated assessment of the degree of transformation of the 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 sandy massif;

	- Determination of the degree and scale of degradation of the pastures of the sandy massif; - identification of spatial and temporal patterns of the fire regime of arid landscapes of the Moyinkum sandy massif over the past 30 years; - To determine the overload of pastures according to the established optimal rate of load on pasture lands and predict the productivity of pastures of the sandy massif; - Develop maps of pastures (natural forage lands) with varying degrees of degradation over time (multi-time); - To develop maps of environmental protection measures to prevent degradation of the pastures of the sandy massif; - Development of recommendations for optimizing pasture management and regulating pasture loads in the context of climate change based on remote sensing data and ground-based monitoring systems; - Development of mechanisms for livestock management and pasture management of arid pastures (using the example of the Moyinkum sand massif) for sustainable land use in the face of climate change based on remote sensing data;
Expected and achieved results	- Theoretical and methodological approaches and techniques for satellite monitoring and management of pasture lands in 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.; - Modern satellite systems used for remote monitoring of pastures and cataloguing satellite images 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; - An assessment of changes in the vegetation cover of the region and an integrated assessment of the degree of transformation of the 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 possibilities of pasture resources of the Moyinkum sandy massif will be carried out.; - The degree and scale of degradation of the pastures of the sandy massif will be determined; - The spatial and temporal patterns of the fire regime of the arid landscapes of the Moyinkum sandy massif over the past 30 years will be revealed; - The overload of pastures will be determined according to the established optimal rate of load on pasture lands and the productivity of the pastures of the sandy massif will be predicted;

	- Maps of pastures (natural forage lands) with varying degrees of degradation in the time period (multi-time) will be developed; - Maps of environmental protection measures will be developed to prevent degradation of the pastures of the sandy massif; - Recommendations will be developed on optimizing pasture management and regulating pasture loads in the context of climate change based on remote sensing data and ground-based monitoring systems; - Mechanisms for livestock management and pasture management of arid pastures will be developed (using the example of the Moyinkumsky sandy massif) for sustainable land use in the face of climate change based on remote sensing data;
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Использование	Ministry of Agriculture of the Republic of Kazakhstan, local authorities, farmers / farms and scientific organizations.
Приоритет в сравнении с реальными аналогами	The fundamental difference between the project idea and existing analogues is that the study will result in a comprehensive solution for monitoring pasture lands in the face of climate change and anthropogenic activity based on field research and remote sensing data.;
List of publications with links to them	Publications are currently being prepared.
Patents	According to the schedule, there is no need for a patent.
!!! Along with the completed form, please attach to email relevant photographs and video materials that can be used to visualize and present the project on the web page.	

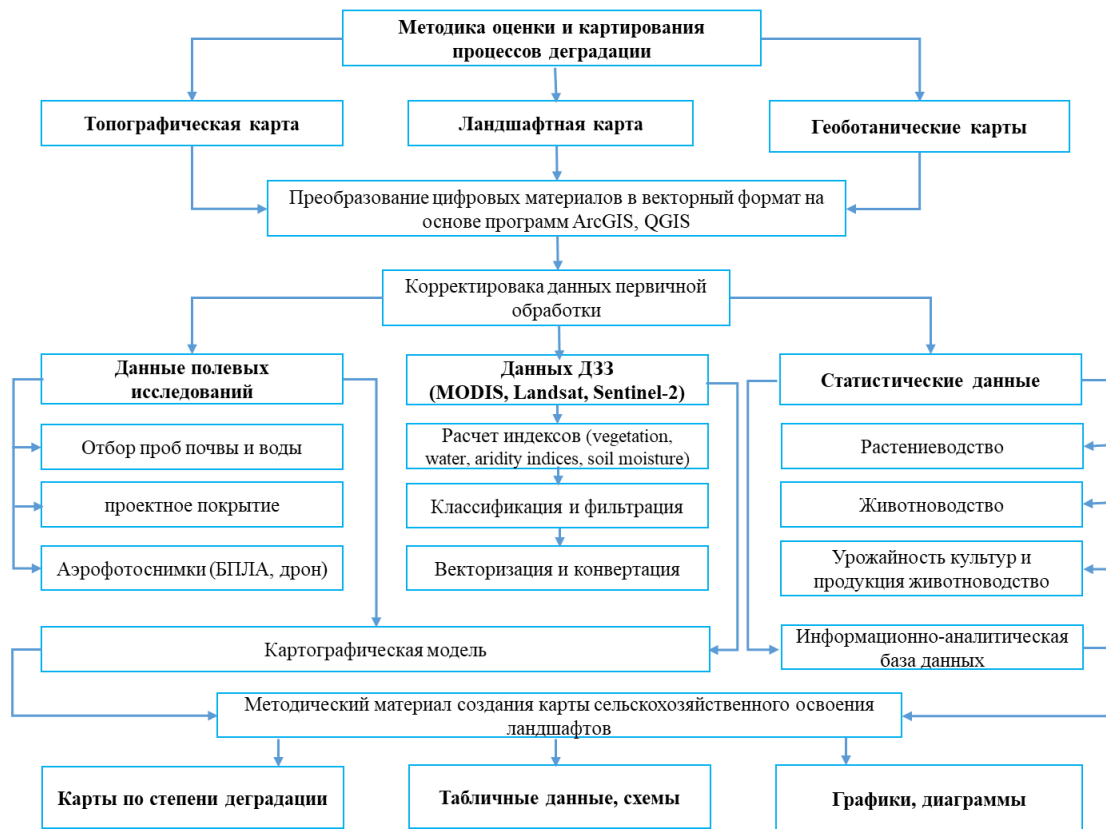


Figure 1. Methodology for assessing and mapping degradation processes using earth remote sensing technologies