Brief information about the project

Name of the project	ITN: BR22886730. theme "formation of the agricultural infrastructure of spatial data of the Republic of Kazakhstan on technologies and principles 2.0". ESM of the Ministry of Agriculture of the Republic of Kazakhstan for 2024-2026.
Relevance	The relevance of the problem is due to the lack of a systematic spatial and temporal platform of the agro-industrial complex (agribusiness) and rural territories (AA) of the Republic of Kazakhstan. For agribusiness and St, such a platform is the agricultural infrastructure of spatial data (Agro-Industrial Complex). The agro-industrial complex is an industry component of the National Dis of the Republic of Kazakhstan (National Spatial Data Infrastructure-NIPD) and performs almost all the functions of the virtual agribusiness. Separate and incomplete functions of the agro-industrial complex of the Republic of Kazakhstan are currently aimed at solving not systemic, but individual tasks of the agro-industrial complex and St. That is, the country has not yet formed spatio-temporal data (GDP) of the Republic of Kazakhstan in the form of the CICA of the Republic of Kazakhstan, which can be easily integrated with economic, social and environmental (ESP) data to assess the sustainable development of the agribusiness and ST of the Republic of Kazakhstan, as well as the Sustainable Development Goals of 2030 (SDGs) and the level of climate change reduction by 2050.
Purpose	Formation of an agricultural infrastructure of spatial data according to the principles and technologies 2,0 as an industry component of the National Spatial Data Infrastructure of the Republic of Kazakhstan for a comprehensive assessment of the activities of the agro-industrial complex and the development of rural areas
Objectives	The tasks of the scientific and technical program are combined into three logically related subprograms: Subprogram 1.formation of the basic agricultural infrastructure of spatial data of the Republic of Kazakhstan in principles and technologies 2.0. - creation or acquisition of spatial data from other sources of Geoinformation systems in the context of farms, districts and regions of the Republic on the principles and technologies for the development of spatial data infrastructure 2.0; - acquisition and collection of long-term remote sensing data of medium and large scale, including topical images of various spatial resolutions, and their compilation according to the principles and technologies for the development of spatial data in the context of farms, districts and regions of the Republic 2.0; - placement of the obtained data in the Geoportal according to the principles and technologies of spatial data Development 2.0. Subprogram 2.development of methods for classifying land use using modern algorithms and cloud computing as a function of the agricultural infrastructure of spatial data of the Republic of Kazakhstan 2.0. - Development of parametric algorithms for the classification of land use and land cover (land use land cover-hereinafter referred to as LULC) on cloud computing platforms as a function of agricultural spatial data of the Republic of Kazakhstan 2.0; - Development of LULC classification algorithms based on Machine learning (ML) on cloud computing platforms as a function of Agrarian spatial data RK 2.0. - Development of deep learning (DL) - based LULC classification algorithms, including artificial intelligence, on cloud computing platforms as a function of the agrarian spatial data infrastructure of the Republic of Kazakhstan 2.0.

	Internal program 3.development of methodological approaches for an integrated assessment of the economic, social and environmental policy of the state for the development of the agro-industrial complex and rural areas as a function of the agricultural infrastructure of spatial data 2.0. -Development of empirical approaches based on big data as spatial-temporal data and functions of the agrarian infrastructure of spatial data for an integrated assessment of the economic, social and environmental policy of the state for the development of the agro-industrial complex and rural areas 2.0 RK; -Development of mL-based approaches for an integrated assessment of the economic, social and environmental policy of the state for the development of the agro-industrial complex and rural areas spatio-temporal data and big data as functions of the agrarian infrastructure of spatial data RK 2.0; -Development of DL-based approaches for an integrated assessment of the economic, social and environmental policy of the state in the development of the agro-industrial complex and rural areas on a large database of spatial and temporal data and spatial data as functions of the agricultural infrastructure of the Republic of Kazakhstan 2.0.
Expected and achieved results	Expected results. Subprogram 1: the basic agricultural infrastructure of spatial data of the Republic of Kazakhstan will be formed on the principles and technologies of 2.0: - spatial data is created or purchased from other sources of Geoinformation systems in the context of farms, districts and regions of the Republic according to the principles and technologies for the development of spatial data infrastructure 2.0; - long-term remote sensing data of medium and large scale, including topical images of various spatial resolutions, is purchased and collected and compiled according to the principles and technologies for developing spatial data infrastructure in the context of farms, districts and regions of the Republic 2.0; - the obtained data will be placed in the Geoportal according to the principles and technologies for the development of spatial data infrastructure 2.0. Subprogram 2: methods for classifying land use using modern algorithms and cloud computing as a function of the agricultural infrastructure of spatial data of the Republic of Kazakhstan will be developed 2.0: - Parametric algorithms for the classification of lulc on cloud computing platforms will be developed as functions of the agricultural infrastructure of spatial data of the Republic of Kazakhstan 2.0; - LULC classification algorithms based on machine learning (ML) will be developed on cloud computing platforms as a function of the agrarian spatial data infrastructure of the Republic of Kazakhstan 2.0. - LULC classification algorithms based on Deep learning (DL), including artificial intelligence, will be developed on cloud computing platforms as a function of the agricultural spatial data infrastructure of the Republic of Kazakhstan 2.0. Subprogram 3: methodological approaches to the development of the agro-industrial complex and rural areas as a function of the agricultural infrastructure of spatial data will be developed for an integrated assessment of the economic, social and environmental policy of the state 2.0: -Empirical algorithms and approaches for an integrated assessment of the economic, social and environmental policy of the state for the development of the agro-industrial complex and rural areas will be developed on the basis of spatial and temporal data and big data as a function of the agricultural infrastructure of the Republic of Kazakhstan 2.0 spatial data;

	- ML-based algorithms and approaches will be developed for an integrated assessment of the economic, social and environmental policy of the State for the development of the agro-industrial complex and rural areas as a function of the agricultural infrastructure of spatial data of the Republic of Kazakhstan 2.0; -Dl-based algorithms and approaches will be developed for an integrated assessment of the economic, social and environmental policy of the state for the development of the agro-industrial complex and rural areas on the basis of spatial and temporal data and large databases as a function of the agrarian infrastructure of the spatial data of the Republic of Kazakhstan 2.0. For the implementation of all subprograms: young specialists are involved, including at least 3 PhD students and 3 undergraduates, 3 recommendations are prepared, 3 certificates of registration of intellectual property rights have been obtained, at least 3 articles are published in peer-reviewed foreign scientific publications with a non-zero impact factor and at least 3 publications in foreign and domestic publications, recommended by KOXNVO. Results achieved. Published: two articles in peer-reviewed foreign scientific publications with a non-zero impact factor, two articles in peer-reviewed foreign scientific publications with a non-zero impact factor, 2 certificates of registration of intellectual property rights were received (- 06,02, 2024 No. 42656; - Dated 23.07.2024 No. 48553), one proposal was issued.
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles	1. Әліпбеки Оңғарбек Әліпбекұлы. Индекс Хирша: 4 ORCID: https://orcid.org/0000-0001-6205-0490, Scopus Author ID: 57190942962 ResearcherID: AAR- 2498- 2021 Link to profile: https://www.scopus.com/authid/detail.uri?authorId=57190942962 2. Алипбекова Чаимгуль Абусагатовна. Индекс Хирша: 4. ORCID: https://orcid.org/0000-0002-6330-3573; Scopus Author ID: 57190944507 ResearcherID: KEJ-3729-2024 Link to profile: https://www.scopus.com/authid/detail.uri?authorId=57190944507 3. Бексеитова Роза Тлеулесовна. Индекс Хирша: 6 ORCID: https://orcid.org/0000-0002-8946-421X Scopus Author ID: ResearcherID – 56128018300 Link to profile: https://www.scopus.com/authid/detail.uri?origin=resultslist&authorId=56128018300&zone= 4. Орынгожин Ерназ Советович. Индекс Хирша: 3 ORCID: https://orcid.org/0000-0002-9452-6817; Scopus Author ID: 56127312400 Link to profile:https://www.semanticscholar.org/author/Oryngozhin-Ernaz-Sovetovich/94099530 5. Турекельдиева Римма Тилепалдиевна. индекс Хирша: 2 Scopus Author ID: 57973014800 https://orcid.org/0000-0002-1650-0005 Link to profile: https://www.scopus.com/authid/detail.uri?authorId=57973014800 6. Женсхан Дарима. Индекс Хирша: 2, ORCID: https://orcid.org/0000-0002-2863-2611 Scopus Author ID: 57192156982 Link to profile:

	https://www.scopus.com/authid/detail.uri?authorId=57192156982
Использование	Scientific and Technical Proposal at the implementation stage
Приоритет в сравнении с реальными аналогами	There are no analogues of the agricultural spatial data infrastructure 2.0 in Kazakhstan.
List of publications with links to them	
Patents	-
!!! 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.	