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5.1.

LEGAL REFORMS RELATED TO RANGELAND USE AND PROTECTION

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In Mongolia, legal relations concerning rangeland are regulated by more than 20 laws currently in force. In recent years, the legal framework for rangeland regulation has undergone significant change, creating a new legal basis aimed at supporting sustainable livestock development, reducing land degradation and adapting to climate change. In particular, the amendments to the Law on Land, introduced in connection with the Law on the Legal Status of Herder Household Associations, adopted by the State Great Khural of Mongolia in 2024, represent a key change that has made rangeland management more clearly defined, practical and based on collective participation.

These amendments legally establish new mechanisms, including the annual determination of rangeland carrying capacity, the allocation of rangelands to primary associations of herder households through contracts for up to 15 years, regular monitoring of contract implementation, and temporary use of rangelands during disasters. As a result, a legal environment is being created for the appropriate use of rangelands based not only on quantitative indicators, but also on vegetation recovery capacity, ecosystem balance and collective organization among herders.



*In Mongolia, the legal framework governing
rangeland is comprised of over 20 active laws.*

5.2.

KEY AMENDMENTS TO THE LAW OF MONGOLIA ON LAND INTRODUCED IN 2024

The amendments to the Law on Land dated 5 June 2024 introduced the following new regulations related to rangeland use, protection and management:

- The definition of rangeland carrying capacity was revised (Article 3.1.13)
 - “Rangeland carrying capacity” is defined as the capacity of a rangeland, expressed by the number of livestock and animals that can graze without negatively affecting the growth, development and recovery of rangeland vegetation. This represents a new definition focused more on ecosystem sustainability than the previous understanding based primarily on “livestock numbers”.
- The mandate of the central state administrative body responsible for agriculture was expanded (Article 19.3)
 - The central state administrative body responsible for agriculture was assigned the following powers:
 - To implement measures for appropriate rangeland use, protection and restoration;
 - To approve, jointly with the Cabinet member responsible for environmental matters, the methodology for determining rangeland carrying capacity.
- The powers of local authorities were clarified (Article 20)
 - The common powers of Citizens’ Representative Khurals and Governors of aimags, soums, the capital city and districts were expanded to include:
 - Approving procedures for appropriate rangeland use, protection and restoration in accordance with local conditions;
 - Determining the boundaries, size and location of rangelands to be allocated by contract to primary associations of herder households, based on decisions of bag Citizens’ Public Khurals and in accordance with the aimag general land management plan and the annual soum plan;
 - Deciding on the temporary movement of livestock into and out of rangelands used for migration and rangelands of other aimags and soums in the event of disasters and hazardous phenomena.
- The authority of land officers was expanded (Article 23.4)
 - Soum land officers were given the authority to:
 - Determine rangeland carrying capacity annually, together with the soum rangeland specialist, in accordance with the methodology jointly approved by the Cabinet members responsible for agriculture and environmental matters;
 - Prepare maps of the boundaries, size and location of rangelands to be used by primary associations of herder households and register them in the land database;
 - Register contracts and regularly monitor and evaluate contract implementation based on the use and condition assessment of rangelands used under contract.
- Regulations on appropriate rangeland use and protection were revised (Article 52)
 - Rangeland use and protection shall be planned and implemented in stages through the aimag general land management plan and the annual soum land management plan (Article



52.1).

- Winter, spring, summer, autumn, transit rangelands shall be allocated with consideration of tradition and carrying capacity. Transit rangelands, water points and salt-lick rangelands shall be used commonly. To protect rangelands from trampling and degradation and to support restoration, soum Governors may allocate rangelands by contract to primary associations of herder households based on proposals from bag Citizens' Public Khurals (Article 52.2).
- Fencing of rangelands used under contract is prohibited (Article 52.11).
- The procedure and contract template for allocating rangelands to primary associations of herder households shall be jointly approved by the state administrative bodies responsible for agriculture and land matters (Article 52.12).
- Contracts may be concluded for up to 15 years and may be extended based on fulfilment of obligations (Article 52.13).

The main new mechanisms created by these regulations and amendments include the following:

- The possibility of concluding long-term rangeland use contracts of up to 15 years with primary associations of herder households encourages herders to use rangelands responsibly over the long term and supports collective management. Monitoring contract implementation through condition assessments can serve as a practical incentive for reducing degradation.
- Annual determination of carrying capacity using a methodology based on photo monitoring and ecosystem indicators makes it possible to align livestock numbers with the actual capacity of rangelands.
- The creation of a legal basis for temporary use of transit rangelands and rangelands of other soums during disasters and hazardous events strengthens resilience to climate change risks.
- The establishment of a monitoring and evaluation system enables regular oversight of contract implementation and condition assessments, strengthens accountability and provides a basis for taking measures in the event of violations.

In connection with these amendments and reforms, changes have also been made to other relevant laws and regulations. At present, Article 23.1.5 of the Law on Administrative and Territorial Units of Mongolia and Their Governance includes provisions on decision-making regarding the boundaries and locations of land to be used for rangeland purposes by primary associations of herder households, as well as the protection, use and regulation of hayfields, croplands, rangelands and water points.

In accordance with the amendments to the Law on Land, a working group has been established by order of the Minister of Food, Agriculture and Light Industry to develop and approve the "Procedure and Contract Template for Allocating Rangelands to Primary Associations of Herder Households". This aims to support sustainable and environmentally friendly livestock production, promote appropriate rangeland use, protection and improvement, and reduce the negative impacts of climate change on livestock production, while taking into account the specific characteristics of ecological zones and belts.

5.3.

DIGITAL TECHNOLOGIES INTRODUCED INTO RANGELAND PHOTO MONITORING

Digital technological innovation plays an important role in making rangeland photo monitoring faster, more accurate and more accessible to users. In recent years, activities have been implemented in stages to expand the land monitoring digital system, introduce mobile applications for field data collection, apply remote sensing methodologies, and pilot machine learning based on photo images.

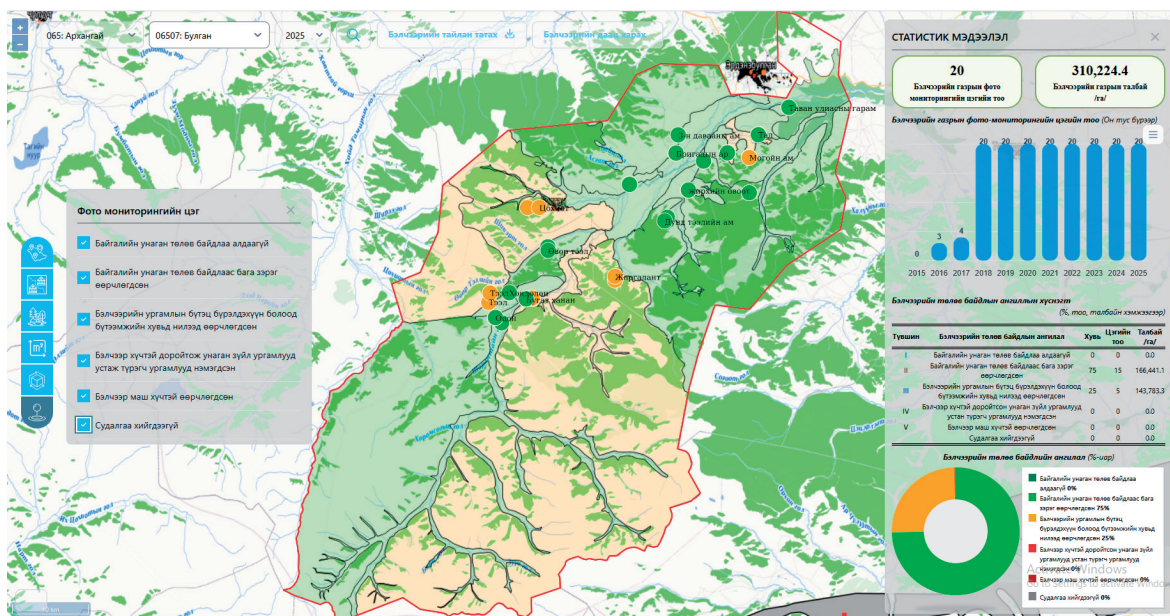
5.3.1. ADDITIONAL DEVELOPMENT OF THE LAND MONITORING DIGITAL SYSTEM

Within the Integrated Land Fund Management System, www.egazar.gov.mn, a new Biodiversity Statistics Dashboard and Rangeland Condition Statistics Dashboard have been developed. These dashboards have improved the quality of rangeland photo monitoring data and created conditions for decision-makers and herders to develop, implement and monitor rangeland management plans that take biodiversity into account, based on the results of five-year average changes in rangeland recovery classes.



The advancement of digital technology significantly enhances the speed, accuracy, and accessibility of photo monitoring in rangeland environments.

FIGURE 14. Rangeland Condition Statistics Dashboard



5.3.2. THE “BELCHEER” MOBILE APPLICATION FOR DATA COLLECTION AND TRANSMISSION

To reduce the workload associated with field surveys and data processing for assessing rangeland change through photo monitoring, the “Belcheer” mobile application, based on modern advanced technology, has been developed. By Order No. A/275 of the Head of the GALAGC, the application has been introduced from August 2025.

By using this application, aimag Departments of Land Administration, Construction and Urban Development, as well as soum land officers and rangeland specialists, can collect data and information more easily and quickly during photo monitoring field surveys. The application also makes it possible to deliver photo monitoring results and information to the public through mobile phones. Step-by-step work has also begun to enable herders themselves to use this application to assess the condition, productivity and carrying capacity of the rangelands they use.

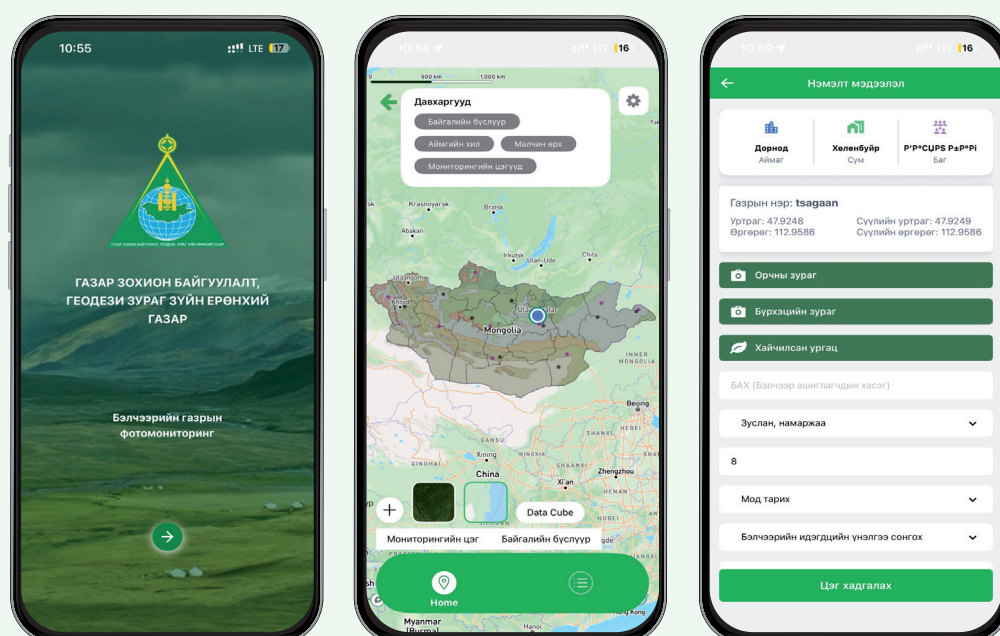
When used for field surveys, the application provides the following functions:

- ✓ Easy identification and location of photo monitoring points;
- ✓ Completion of paper-based forms within the application;
- ✓ Uploading photographs taken by mobile phone to the database server using the mobile network;
- ✓ Functionality in locations without mobile network coverage.



The “Belcheer” application has been introduced since August 2025.

FIGURE 15. “Belcheer” Application Interface



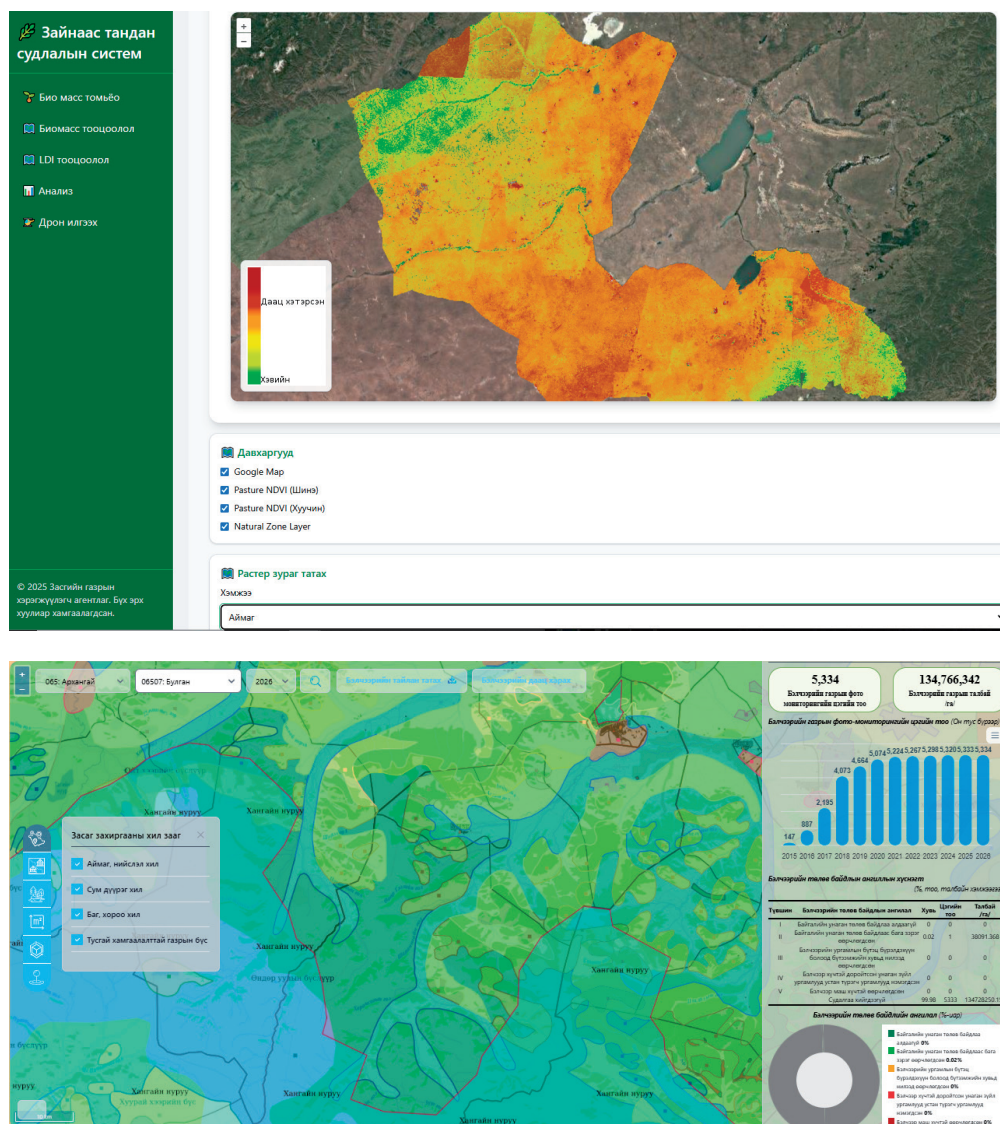
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5.3.3. INTEGRATION WITH REMOTE SENSING TECHNOLOGY

The land monitoring digital system has been expanded to enable monitoring of all categories of land under the Unified Land Fund at the national level. A national land monitoring network has been established, inter-sectoral information exchange has been accelerated, and a web-based shared database has been created. Activities related to land protection and restoration measures are being fully digitalized and combined with remote sensing methods and technologies. These developments are being implemented and used in land monitoring operations.

FIGURE 16. The “Remote Sensing” Module of the Land Monitoring Digital System



Efforts concerning land protection and restoration initiatives are undergoing digital transformation, integrating remote sensing techniques and technologies, which are subsequently employed in land monitoring activities.



The national reports on “Damage Caused to Land” and “Restoration”, which form part of the State Unified Report on the Unified Land Fund, are now generated automatically through the digital system at the national level. This has improved coordination among government institutions and enabled the production of unified national statistical information. In particular:

- ✓ Information on polluted and degraded land can now be registered using photo monitoring results;
- ✓ The resulting database, including records of damage caused to land, can be transferred through the shared database to the Land Management and Urban Planning Digital System;
- ✓ Reports such as GNST-9 and BOH 1.2 can be generated from the damage registration data through the digital system.

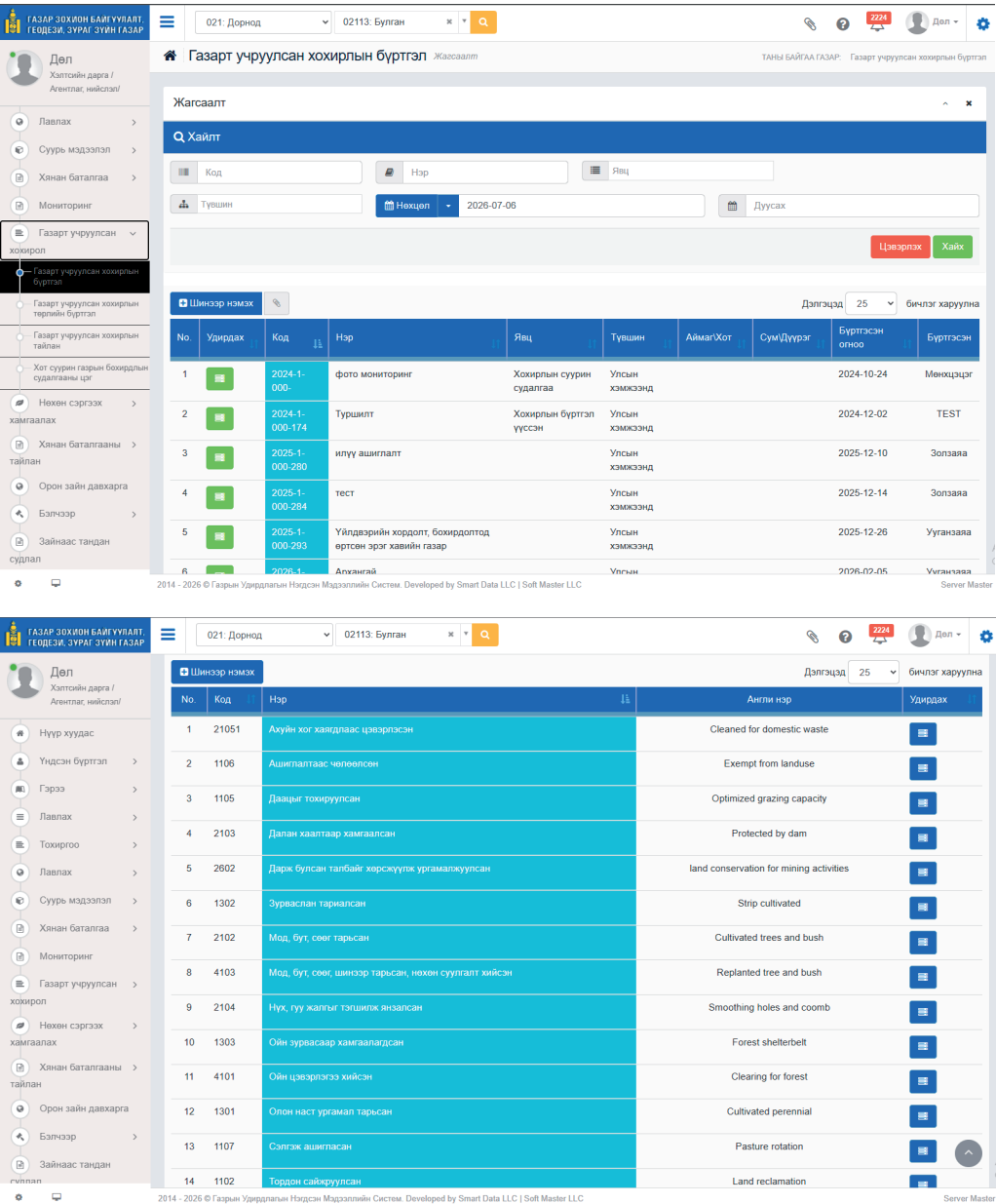


FIGURE 17. Section on Reports on Damage Caused to Land and Restoration

5.3.4. USE OF MACHINE LEARNING METHODS FOR PHOTO MONITORING DATA

To simplify the implementation of the rangeland photo monitoring methodology and improve its results, experimental research was conducted using photo monitoring data from Khuvsgul and Dornogovi aimags. The study tested the use of machine learning methods to determine vegetation cover and biomass from field survey photographs.

In this experimental study, quantitative vegetation survey data collected through rangeland photo monitoring were processed using machine learning methods. Among the tested models, the ConvNeXt-Tiny model showed the best performance for estimating vegetation cover and biomass from photographs. The results indicate that image-based information can explain approximately 30 per cent of the variation in vegetation cover ($R^2 \approx 0.32$), while the average prediction error generally falls within ± 15 – 20 per cent. In practical terms, this suggests that rangeland vegetation cover can be estimated from photographs with an average reliability level of about 60–70 per cent, while biomass, which is directly related to vegetation cover, can also be estimated at a moderate reliability level of approximately 55–65 per cent.

Rangeland vegetation cover and biomass are among the key indicators used to assess livestock carrying capacity and the condition of rangeland use. Determining these indicators through traditional methods, such as field measurements, visual estimation and laboratory analysis, requires considerable time and cost. It is also difficult to generate continuous information across space and time using traditional approaches alone. For this reason, experimental research has been conducted over the past one to two years to introduce automated assessment methods based on photo monitoring data.

To simplify and improve the highly manual data processing procedures currently used in rangeland photo monitoring, and to combine them with modern technologies, research was conducted on whether the SamplePoint software could be used to identify invasive or undesirable plant species and estimate plant biomass through machine learning methods. The study indicates that there is considerable potential to select and apply several machine learning methods, as well as internationally used mobile applications, that are suitable for Mongolia's conditions.



There exists significant potential to identify and implement machine learning techniques and globally utilized mobile applications that are appropriate for the specific conditions of Mongolia.

5.4.

UPGRADING FIELD SURVEY TOOLS AND EQUIPMENT

Regular upgrading of tools and equipment used for field surveys is of great importance. Within the framework of the “Promoting Dryland Sustainable Landscapes and Biodiversity Conservation in the Eastern Steppe of Mongolia” project, high-capacity professional multi-spectral drones, laptops, mobile satellite internet devices, GPS units and other equipment were handed over. This has provided practical support for improving land use, registration, monitoring, land cover monitoring, and the quality and accessibility of field surveys.

In addition, all soum land officers and rangeland specialists in Khentii, Dornod and Sukhbaatar aimags were provided with complete sets of tools and equipment required for rangeland photo monitoring field surveys. This represents a good practice in strengthening both local capacity and technical readiness.

Efforts to assess rangeland condition and strengthen the national photo monitoring system are developing on the basis of broad cooperation networks, multi-level partnerships, human resource capacity and technological innovation. Research institutions contribute methodological improvements and scientific validation; international organizations provide support for policy, institutions, financing and experience exchange; and digital platforms, mobile applications, and upgraded field survey tools and equipment are making monitoring results more accurate, timely and accessible to users.

Figure 18. Equipment Handed Over



Efforts to assess rangeland conditions and improve the national photo monitoring system are advancing through comprehensive collaborative networks, multi-level partnerships, the enhancement of human resource skills, and technological innovations.

