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STRATEGIC PLANNING FOR PEATLANDS CONSERVATION AND WISE USE IN MONGOLIA:

EXECUTIVE SUMMARY OF THE ASSESSMENT REPORT

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EXECUTIVE SUMMARY OF THE ASSESSMENT REPORT ON PEATLANDS IN MONGOLIA

Peatlands globally, and specifically in Mongolia, play a crucial role in securing livelihoods through the provision and maintenance of water resources, ecosystem productivity and diversity, and climate change mitigation and adaptation. Peatland degradation is followed by the thawing of the permafrost layer – the largest storage of fresh water in Mongolia. When peatlands degrade, they lose their water retention capacity and ecosystem productivity. Peatland degradation causes a reduction of habitats and losses in biodiversity. Degraded peatlands are significant sources of greenhouse gases, including those which are released from the underlying permafrost. The livelihood of people and national environmental security are threatened by degrading peatlands.

Recognizing the urgent need to address the issue of peatland loss and degradation, and build capacity for peatland management in a systematic way, the Government of Mongolia requested Technical Assistance from the Asian Development Bank to support development of a Strategic Action Plan on Peatlands Conservation and Wise Use in Mongolia. An Assessment Report was prepared to provide the scientific foundations for the Strategic Action Plan.

The Assessment Report on Peatlands in Mongolia provides the most comprehensive information to date on peatlands in the country. It brings together existing data and newly accumulated field data on peatlands diversity, distribution, ecosystem functions and services, current status and threats, as well as civil society, economic and governance capacity to meet the obligations and challenges of peatlands conservation and use.



Sketch of natural, socio-economic and political features of Mongolia

Mongolia is the world's most sparsely populated country. It is landlocked and rests on the southernmost fringe of the Great Siberian boreal forest, the northernmost Central Asian deserts and the vast steppes bordering the Russian Federation in the north and the People's Republic of China in the east, south and west. The hydrographic network of Mongolia belongs to three basins – Arctic Basin, Pacific Basin and Central Asian Closed Basin.

Mongolia's economy is dominated by animal husbandry, with pastoral nomadism. Approximately 75.5% of the total territory of Mongolia is utilized for agriculture, of which 96.2% is used for pastureland. Pastoral nomadism in Mongolia defines traditional values more than in most other nations with a relatively large pastoral component. Herder households herd their livestock during four seasons of the year and the productivity of the livestock forms the main source of household livelihoods.

Under existing laws and regulations, land is classified as follows: lands for agriculture; lands for towns, villages and other urban settlements; lands for roads and other infrastructure networks; lands with forest resources; lands with water resources; lands for state special needs, including natural protected areas.

Currently, 29 laws and over 100 regulations regulate the environment and ecological security in Mongolia. The prime legal act for environmental protection is the Constitution of Mongolia, which states that all types of natural resources shall belong exclusively to the people and be under State protection. This applies to the use of land, including the conservation and rational use of peatlands. Currently none of these legal documents incorporate any article or provision about peatlands. Meanwhile, peatlands are the subject of many sectors; regulation of land use on peatlands requires an integrated approach.

According to the Constitution, international legislation in Mongolia has priority over national regulations. This means that if an international treaty to which Mongolia is a party is inconsistent with national laws, the provisions of the international treaty shall prevail. Mongolia has joined 18 international environmental conventions, agreements and protocols. These international treaties and bilateral agreements have equal power with national legislation. The following international conventions, multilateral and bilateral agreements that Mongolia has joined or signed have relevance to the conservation and use of peatlands:



- The Convention on Wetlands of International Importance (Ramsar)
- United Nations Convention on Biological Diversity
- United Nations Framework Convention on Climate Change
- Convention on the Conservation of Migratory Species of Wild Animals
- Agreement with the Natural Resources Management and Environment Department of the Food and Agriculture Organization (FAO) of the United Nations
- Bilateral Agreement on Transboundary Water between Mongolia and the Russian Federation
- Bilateral Agreement on Transboundary Water between Mongolia and the People's Republic of China
- Bilateral Agreement on Transboundary Forest Protection and Steppe Fire Prevention between Mongolia and the Russian Federation

National environmental laws that have some indirect relationship to peatland issues include:

- Law on Environmental Protection
- Law on Land
- Law on Special Protected Areas
- Law on Water
- Law on Forest
- Law on prohibiting mineral exploration and extraction near water sources, protected areas and forests
- Law on Protection of Soil and Prevention from Desertification

The loss and degradation of water resources in Mongolia is an issue that needs to be urgently addressed. The most effective approach is integrated water management of river basins. This involves preparation of a detailed inventory and mapping of all water objects and sources of water at the basin level. This should include peatlands and permafrost areas. At the moment, the legal framework requires an integrated river basin management approach, but does not consider peatlands and permafrost areas as parts of water objects. Changing this could be undertaken without specific legal obstacles.

Permafrost plays a key role in the water supply and regulation of Mongolian rivers, while peatlands could serve to protect permafrost from thawing. The latest estimates have demonstrated significant reductions in permafrost across the country. Due to climate warming and the significant negative effects of human activities such as overgrazing and active mining, permafrost is in a state of disequilibrium with surrounding areas and it is disappearing in some areas.

According to a data set accumulated between 1940 and 2013, air temperature in Mongolia has increased by 2.10°C (winter 2.60°C and summer 1.40°C) and precipitation has decreased by 4% (decrease of 7% in summer and increase of 24% in winter). The number of extremely hot days has increased, and the number of extremely cold days has decreased. Warming has been shown to be more intensive in the mountain regions of the country.

According to the climate change impacts, vulnerability and risk assessment, the prediction of climate change shows that temperatures in all seasons will increase steadily, winter precipitation will also increase but summer precipitation will not increase. In Mongolia, climate change will cause more drought and aridification. There is no doubt that the main socio-economy sectors of the country will be directly and indirectly affected by climate change. Peatland management and wise use could be considered as both mitigation and adaptation measures under conditions of climate change.



Sources of information for strategic planning on peatlands conservation and wise use

The analysis of information demonstrated that there is a large pool of available open and high quality information at the national level which could be used for periodic assessments of peatland status and hazards at the national level, if the information is up-to-date. Special sectorial information contained in open reports, as well as scientific information, should be the subject of special expertise to serve the needs of periodic peatland assessments.

Data from remote sensing analysis could be used in assessments being processed for special purposes (such as productivity, vegetation index, soil humidity etc.). The availability of large scale spatial information is a clear gap, which should be filled together with the introduction of spatial information based on land management systems at the aimag and soum levels.

There is clear demand from the government to produce an actual map of peatlands which could serve as reference information for several sectors.

History of peatlands study in Mongolia

Peatlands have only recently been addressed as a specific natural object. Nevertheless, it is possible to find useful historical information on peatlands and their components in studies on vegetation and flora, paleoecology, carbon balance and landscape hydrology.

Integrated research on peatlands in Mongolia started in 2003, when the Institute of Botany of the Mongolian Academy of Sciences (MAS), Institute for Problems in Ecology and Evolution of the Russian Academy of Sciences (RAS), MonMap, and Wetlands International implemented the project, "The inventory of peatlands in Mongolia for purposes of their conservation and wise use" with financial support of the Global Peatland Initiative (DGIS-NL).

In the framework of this project, peatland distribution and peatlands types in the low land and high mountains were described, the ecological role of the mire ecosystem was revealed and ways for protection were identified. Additionally, a map of peatland containing ecosystems and peatland map of the pilot region Huder were developed. In the framework of the Joint Russian-Mongolian Complex Biological Expedition, peatland surveys in Mongolia were also conducted in 2007 and 2013.

Diversity and distribution of peatlands in Mongolia

The classification of peatlands used in the Assessment Report combines features such as the position of the peatlands in the landscape, hydrological regime and dominating vegetation. This classification best takes into consideration the spatial heterogeneity at various levels, which is a peculiar feature of most peatlands.

Mire diversity in northern, central and north-eastern Mongolia is high and consists of several peatland types in forest and steppe zones as well as in highlands, valleys and on permafrost. The assessment identified 14 types of mire massifs that can be found in different latitudinal and altitudinal zones.

Mire massifs form distinct habitat patches that may be spatially separated by large distances, and are characterised by: high water level and moisture content; considerable fluctuations of surface temperature; low oxygen content; accumulation of toxic substances and absorbed gases; limited availability of nutrients; and higher acidity than surrounding ecosystems (in most cases).

Peatland biological diversity on the species level is usually low because of the extreme habitat characteristics of mires. Nevertheless, the flora and fauna of peatlands in Mongolia are enriched by species of other habitats. There are a number of flora species that are listed on the Red List of Threatened Species or are considered very rare and are covered by the Mongolian Law on Natural Plants.





Similarly, peatlands provide habitat for a range of rare fauna species registered by the International Union for Conservation of Nature (IUCN), the Convention on Migratory species (CMS), “CITES” Convention on International Trade in Endangered Species of Fauna and Flora, law on animals of Mongolia and Mongolian Red Book

A number of steps were taken to prepare detailed maps of peatlands as background for a spatial analysis of hazards and threats to peatlands, planning of land use compatible with peatland conservation, as well as planning of peatlands protection and restoration measures. These are presented in detail in the Assessment Report.

The outcomes of a comparative spatial analysis were used as background for the verification of the distribution of peatlands in ten priority areas. The results demonstrated a significant decrease of the peatland area compared to that estimated in 2004. The average decrease for three of the 10 priority areas was from 70% to 60%. At the moment, due to the shortage of data for the whole area of Mongolia, the outcomes of the statistics on peatlands area changes can be extrapolated to the relevant landscape types within correspondent biogeographic zones. This means that the estimated area of peatland at the current moment would not be 1.7% of the area of Mongolia as previously reported, but 1%. The remaining peatlands should be addressed urgently.

Values, threats and management of peatlands

Peatlands in Mongolia are extremely valuable ecosystems, which carry diverse ecosystem functions and services. The concept of ecosystem services had been developed based on the Millennium Ecosystem Assessment by the Convention on Biological Diversity as a mechanism to develop incentives for biodiversity conservation. Equal and sustainable access to peatlands ecosystem services is provided by their proper management and conservation.



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In order to assess ecosystem services, it is necessary to assess the significance of the natural functions of the ecosystems for different groups of stakeholders. Ecosystem services should be assessed for individual peatlands or priority sites. For managing a particular peatland, the ecosystem services should be assessed for each class of landscape which can be identified within the peatland. The study addressed the following mapping classes: the landscape type units within a peatland, peatland types, and the priority sites.

From an analysis of ecosystem services, the following economic sectors and dependent social groups were identified as benefiting from or depending on the proper maintenance and conservation of peatland ecosystem natural functions: Agriculture (herding, haymaking, crops), forestry, animal husbandry, water supply, industrial water supply (mining, hydropower construction), water management and flood control, tourism, infrastructure development.

The main factors that have over time hindered the sustainable management of peatlands in Mongolia include: the expansion of pastures in peatland; the development of extractive industries, especially in highland areas; development of infrastructure, including roads; and inappropriate water discharge and management. These factors have been exacerbated by climatic changes.

A comparison between a map showing the distribution of protected areas in Mongolia and the location of peatlands showed that around 40% of peatlands in Mongolia are protected under the status of state protected areas. There are also a number of Ramsar sites, Important Bird and Biodiversity Areas (IBA) and East – Asian Australasian Flyway Network Sites. Despite this coverage, there are some clear challenges in the conservation of important wetland habitats. Prolonged drought conditions, land use changes, overgrazing, fire, pollution from mining sites, and unsustainable water use are the main threats to wetland areas in Mongolia. There are adequate laws and regulations to improve the situation; however, law enforcement activities need to be strengthened.

The assessment highlighted gaps in knowledge about peatlands, including their distribution, diversity, ecosystem functions and services, and their values. This lack of knowledge is mirrored by a general lack of awareness about peatlands across different sectors of society. Overall, awareness is weak in relation to: the biological and landscape diversity of peatlands, the multiple benefits they provide, appropriate utilisation, their hydrological characteristics, and conservation and restoration options. This is particularly concerning in the case of rangers and other employees working at sites registered under, for example, the Ramsar Convention, as it prevents the development and implementation of research and conservation actions in these locations.

The challenges of strengthening capacity for the management of peatlands are reflected in the range of stakeholders that need to be engaged. They span the national to local levels, and involve actors involved in legislative processes, policy making and implementation. Moving towards improved peatland management is a cross-sectoral undertaking, requiring the engagement of not only different state sectoral agencies, but also small-scale pastoralists, private sector interests and civil society organizations.

At the national level, there are a number of approaches that could be taken to improve peatlands management, including: protection; wise use practices for industry, water management and hydrometeorology, forestry; restoration; spatial planning. At the local level recommendations were generated for ten priority areas, as presented below.

Special studies in priority areas: Approaches and methods

To inform the assessment, biophysical and socio-development field data was collected in 2015-2016 from ten peatland priority areas across the country. Criteria for selection of priority areas included: to represent the diversity of peatlands and biogeographical characteristics; to represent all land use practices, social and economic issues; expressed interest of local authorities; opportunities to resolve the issues.

The first very rough estimation of borders of peatlands (mire massifs) within priority sites was undertaken through the capture of vectors from topographic maps relevant for the project. This was then followed up with field surveys. The bio-physical field surveys aimed to provide information on the bio-physical features and spatial distribution of peatlands. The mire massifs were chosen in advance using satellite images.

A mire massif was described by its position in the landscape, water source and discharge, uses, state of degradation, and key vegetation patterns. For ground truthing, profiles or transects were established. Transects were identified by coordinates, with the aim to cross a peatland from one border to the other, sampling specific points, where possible. For each point the following characteristics were recorded: peat depth, soil profile features, soil carbon content, soil temperature gradient, soil humidity, water table level, permafrost depth, vegetation type, level of degradation.

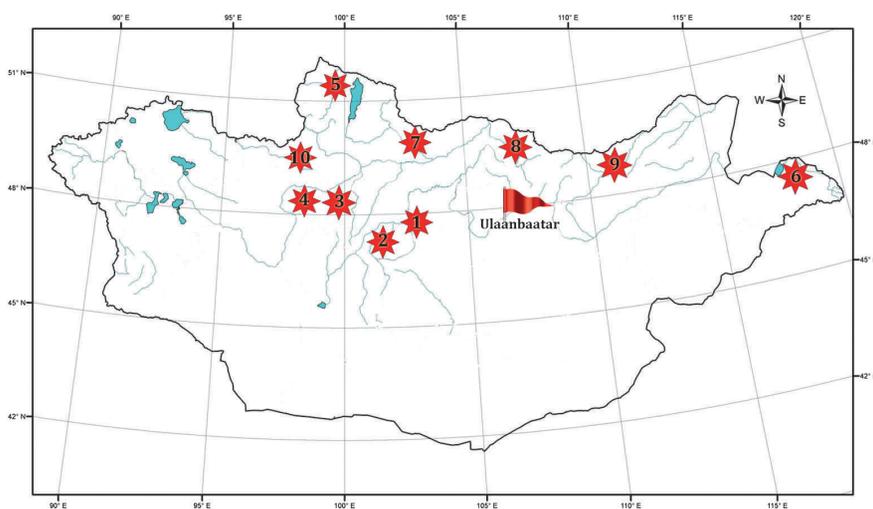
Special studies were conducted for the identification of permafrost depth and some other soil profile features (water table depth, the peat depth in frozen profile). To obtain additional information, two advanced technical methods were used: ground penetrating radar and electric resistance tomography. The other special study was set up for greenhouse gasfluxes studies with chambers.

The objectives of the social-development field surveys were to: understand the threats to peatland areas, long term trends and the associated drivers of degradation; assist in identifying realistic solutions to address the drivers and threats; assist in establishing the goals and objectives of the Peatland Strategic Action Plan, especially in relation to the education and awareness, conservation and restoration chapters; assist in the identification of pilot initiatives for conservation and restoration to be included in the Strategic Action Plan. In the priority area soums that the team visited, they met with government officials and collected the land use information and statistical data.

Additionally, the team conducted semi-structured interviews with local community members who use peatland areas. Interview guidelines were developed to guide the discussions. Following the field studies, the data was analysed using Statistical Package for the Social Sciences (SPSS).

Recommended actions for priority areas

In the face of rapidly declining peatland areas, priority should be given to those actions in different sectors that aim at protecting existing peatlands, restoring degraded peatlands and at preventing further degradation of peatlands in use through stricter regulations and control. This calls for both action at the national level in terms of cross-sectoral approaches to management, and interventions at the local level (for the priority areas that were the focus of the assessment, see the figure below).



Priority areas: 1. Orkhon, 2. Tuvshruulekh, 3. Terkhiin-Tsagaan nuur, 4. Solongotin davaa, 5. Darkhadiin Khotgor, 6. Dornod-Buir nuur - Bayan nuur, 7. Bulgan, 8. Western Khentey, 9. Onon-Balj, 10. Tesiin gol



The Assessment Report identifies the following specific actions for each of the priority areas in order to prevent further degradation of critical peatlands:

1. Orkhon priority area

- Conduct detailed study and modelling of the river basin hydrology, considering peatlands as water bodies.
- Identify key hazards to the hydrology of the catchment, including water quality and flow.
- Identify mitigation and restoration measures, including minimizing of upstream mining impact, optimization of linear construction solutions, optimization of the agriculture land use system.
- Identify well preserved peatland areas in the valley and ensure their strict protection.
- Establish and implement pilot projects on ecosystem-based restoration of peatland ecosystems in Khashaat soum, Nomgon bag.
- Improvement of management of protected areas: Orkhon Valley National Park and Ogii Nuur Ramsar Site and Flyway Network Site at the national level, including establishment of management objectives and monitoring capacity. Consider extension of the area of the Orkhon valley National Park to include the Ramsar site and Ogii Nuur East Asian-Australasian Flyway Partnership Network site and nominate the protected area to the Biosphere Reserve programme.
- Establish regular monitoring of the status of bird populations and habitat use as part of protected area activity, as well as regular monitoring of biodiversity, including invertebrates, fish, mammals, vegetation and flora.
- Increase the tourism capacity of the area and make tourism sustainable as a part of the potential Biosphere Reserve management plan.
- Focus agriculture production on local needs, including tourism development, reducing exports to the other regions of Mongolia.
- Establish education and awareness programs to increase the understanding of the natural functions of peatlands.

2. Tuvshruulekh priority area

- Undertake an inventory of the paludified shallow peat forests and spring fens, including designating their habitat capacity and input into the local economy.
- Develop a plan for the management of those ecosystem types, including regulation of cutting and nut harvesting and designation of part of those forests for protection (possibly as a cluster of the Orkhon National Park).
- Identify the grazing capacity for the valley peatlands and introduce limits and spatial planning for pasturing.
- Identify springs and other water sources and develop a plan for their protection, including organizing alternative artificial water sources and protection by fencing of natural water sources.
- Estimate the hay making capacity of sloping mires and calcareous fens and identify measures for soil protection.
- Use the existing scientific station infrastructure to monitor the status of permafrost, hydrology and a wide range of parameters of biodiversity.

3. Terkhiin-Tsagaan nuur priority area

- Conduct a more detailed study of peatland distribution and natural functions.
- Raising awareness and improving knowledge of local communities and administrations (Tariat and Khangai soums of Arkhangai aimag) on the natural functions and ecosystem services of peatlands.
- Review and improve management of the Khorgo, Terhiin Tsagaan nuur National Park in order to consider the role of peatlands in the maintenance of the water level in both lakes and river recharge.
- Provide capacity for the long-term monitoring of key peatlands parameters (water level, peat moisture, carbon content, permafrost status, productivity, and a wide range of biodiversity, including invertebrates, fish, birds, mammals, vegetation and flora) as part of protected area activity.
- Establish regular monitoring of the status of bird populations and habitat use as part of protected area activity.
- Introduce a methodology for adaptive management of the Khorgo, Terkhiin Tsagaan nuur National Park based on the monitoring of results and updated knowledge.
- Identify the main hazards for peatlands from current usage, including tourism, infrastructure development and agriculture.
- Develop technical solutions for this area for sustainable tourism and infrastructure development.

4. Solongotiin davaa priority area

- Conduct mapping and inventory of the highland peatlands of the ridges surrounding Solongotiin davaa.
- Establish monitoring points for permafrost status and peatlands characteristics (including abiotic and biotic parameters and biodiversity of all relevant groups) in Solongotiin davaa and other representative areas which are accessible.
- Extend the the borders of the protected area of the Tarvagatain Nuruu National Park in order to include all peatlands of the priority area. To evaluate the effectiveness of the functioning of protected areas from the perspective of peatland conservation and develop recommendations to improve conservation.
- Introduce engineering solutions for road construction on permafrost and peatlands for Solongotiin davaa and other relevant areas where roads are passing through highland peatlands.
- To monitor and manage forest fires improve infrastructure and the capacity of local administrations (Zavkhan and Arkhangai aimags and Tsahir and Ih-Uul soums) for fire prevention and control.
- To develop and undertake measures for minimizing the impact of pasturing on the transitional sloping mires.
- To set up mechanisms, including leaflets and posters, for informing the local population, administration (Zavkhan and Arkhangai aimags and Tsahir and Ih-Uul soums), National Park visitors, and people passing by on the values and conservation needs of the peatlands.

5. Darkhadiin Khotgor priority area

- Conduct mapping and inventory of the highland peatlands in the ridges around Darkhad kettle.
- Evaluate the effectiveness of the functioning of protected areas from the point of peatland conservation and develop recommendations to improve conservation.
- Integrate special solutions for the protection of highland peatlands into the management plans of the Khoridol saridag and Ulaan taiga strictly protected areas and Tengis Shishged and Khuvsgul National Parks.
- Extend the area of relevant protected areas in order to provide protection of peatlands in the Shishgedgol upstream valleys and kettle of Dood-Tsagaan Nuur and Tuurga Nuur lakes.
- Establish monitoring points for permafrost status in peatlands areas in Darkhadiin Khotgor.
- Establish hydrological monitoring and conduct a study and comprehensive modelling of the hydrological regime of the Shishgedgol basin in order to include peatlands into integrated river basin management scheme.
- Conduct regular monitoring of biodiversity in the Shishgedgol river and lakes valley, including data on invertebrates, fish, birds and all other groups of animals (including usually overlooked invertebrates, reptilia and amphibia), vegetation and flora.
- Include information on peatlands into awareness and educational programmes of all four protected areas in the region.
- Monitor and manage forest fires, improve infrastructure and capacity of local administrations (Khuvsgul province and Renchinlkhumbe, Tsagaannuur, Ulaan-uul, Khankh soums) for fire prevention and control.
- Develop and undertake measures for minimizing the impact of pasturing on the Shishgedgol river and lakes valley and transitional sloping mires in the piedmonts and ridges.

6. Dornod-Buir nuur – Bayan nuur priority area

- Conduct mapping and inventory of the highland peatlands on the ridges of Lamyn Hairhan uul and other uplands of the catchment of the Nomrogiin river, including within strictly protected areas.
- Evaluate the effectiveness of the functioning of the strict protected areas of Nomrog and Dornod Mongol from the perspective of upland peatland conservation and develop recommendations to improve conservation.
- Upscale the protection status of the Ih Tashgay Nuur lake and surrounding wetlands in order to to: ensure national protection status, nominate the site to the status of wetlands of international importance (Ramsar).
- Provide an adequate protection regime and management solutions to maintain the ecological features of Ih Tashgay Nuur lake and surrounding wetlands: to exclude all land use including grazing on peatlands surrounding the lakes, to set up buffer zones with limitations of agriculture and introducing sustainable fertilizers-free methods, to regulate the other use of peatlands and adjacent areas including road construction.
- Establish monitoring of permafrost and wetland status around the Ih Tashgay Nuur lake and surrounding wetlands, including all parameters of biodiversity (invertebrates, amphibians, fish, birds, mammals, vegetation and flora) and include the results in the adaptive management scheme.
- Establish regular monitoring to determine the status of bird populations and habitat use as part of protected area activity and in response to proposed management activities.
- Promote locally and globally the significance of the area of Tashgay Nuur lake and its surrounding wetlands for the maintenance of global flyways, including rare species of cranes and waterfowl.
- Develop awareness materials on the peatlands of the Eastern Mongolia and include information on the natural and social values of peatlands in the awareness programs of the strict protected areas of Nomrog and Dornod Mongol and those of tour operators.
- Assess the role of peatlands in the regulation of the water regime of the catchment and use this information in all development plans and in negotiations on the transborder waters with China and any development of mutual economic projects within the area.
- Provide relevant information on peatlands to local administrations (Dornod aimag and Khalkhgol soum) and to companies in the region as background for EIA and decommission planning for mining projects (salt and oil).
- Carry out an inventory of peatlands destroyed by industry or the construction sector; plan and implement peatland restoration projects.



7. Bulgan (Selenge catchment) priority are

- Conduct mapping and inventory of the highland peatlands in the ridges of the Tarbagatai, Buteel and Khantai, Jid mountain ranges, including those within the Jid-Khantai-Buteeliin nuruu strictly protected area and Khan jargalant uul and Namnan uul National Parks as intersectoral objects.
- Include peatlands in the water cadastre as water objects.
- Set up hydrological monitoring and to carry out a study and comprehensive modelling of the hydrological regime of the upper Selenge basin in order to include peatlands into integrated river basin management schemes.
- Provide capacity for forest fire prevention and control.
- Ensure that all peatland related calculations of hydrology are integrated in the feasibility study of flow regulation and dam construction on the Orkhon River and Shuren dam on the Selenge river and in case the projects are approved – to consider this information within the EIA, strengthened by cost benefit analysis.
- Highlight information on the role of peatlands in the forming of river flow, maintenance of biodiversity, carbon sequestration and climate regulation to all stakeholders in the regions, including the local population, administrations (Huvsgul and Bulgan aimags and Selenge, Teshig, Khutag-Undur, Tarialan, Erdenebulgan soums) protected areas management bodies, national ministries and regulators involved in decision making on the large scale hydrological projects, including hydropower dam construction.
- Develop and implement a methodology for the evaluation of ecosystem services of peatlands, and carry out relevant assessments as background for compensation policy in hydropower dam construction and mining projects.
- To introduce monitoring of a wide range of parameters of biodiversity as part of the compensating activities of development projects.
- Carry out spatial assessment of the capacity of peatlands to host agriculture without losses. Provide recommendations for spatial distribution and methods for sustainable agriculture.
- Develop awareness materials on the peatland of the Selenge catchment and include information on the natural and social values of peatlands in the awareness programs of the regional administrations (Huvsgul and Bulgan aimags and Selenge, Teshig, Khutag-Undur, Tarialan, Erdenebulgan soums), Jid-Khantai-Buteeliin nuruu strictly protected area, and Khan jargalant uul and Namnan uul national parks.

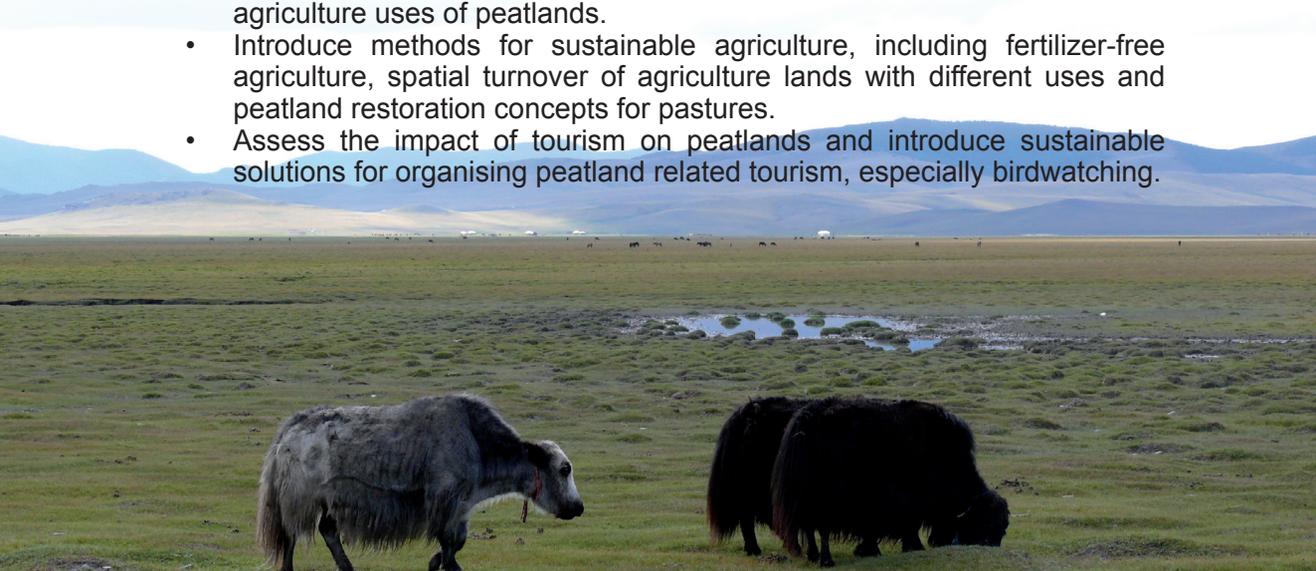


8. Western Khentey priority area

- Carry out mapping and inventory of the highland peatlands as intersectoral object in the Khangay ridge, including the Khan khentii darkhan tsaazat gazar strictly protected area and Gorkhi Terelj National Park.
- Include peatlands as water objects in the water cadastre of respective aimags (Khentii and Darkhan).
- Carry out a study and comprehensive modelling of the hydrological regime of Huder, Yeroo and middle Orkhon and Selenge catchment in order to include peatlands into integrated river basin management scheme.
- Include into EIA procedures for planning of mining in the highlands, considering peatlands as water objects and part of the river catchment.
- Carry out an inventory of peatlands destroyed by the mining sector in Khentey and in the middle Orkhon catchment and set up a program for site reclamation by methods of ecological restoration.
- Introduce ecosystem restoration approaches into existing and newly started mining projects, including setting up incentives related to climate change programmes.
- Carry out a spatial assessment of the capacity of peatlands to host agriculture without losses. To provide recommendations for the spatial distribution of different agriculture uses of peatlands.
- Introduce methods for sustainable agriculture, including fertilizer-free agriculture, spatial turnover of lands and peatland restoration concepts.
- Monitor and manage forest fires, and improve the infrastructure and capacity of local administrations (Khentii and Darkhan-Uul aimags and Altanbulag, Bayangol, Eroo, Javkhlant, Zuunburen, Mandal, Orkhon, Saikhan, Sant, Khuder, Khushaat, Shaamar, Darkhan, Orkhon, Hongor, Shariingol soums) for fire prevention and control.
- Integrate peatland conservation, protection and monitoring tasks in the management plans of the strict protected area “Khan khentii darkhan tsaazat gazar” and national park “Gorkhi Terelj”.
- Include in the monitoring programs of protected areas as well as in the rehabilitated areas after mining, monitoring of all parameters of biodiversity, not only key peatland species, but including usually overlooked groups such as invertebrates, amphibians and reptiles.
- Develop awareness material on the peatlands of the Selenge catchment and include information on the natural and social values of peatlands in the awareness programs of the regional administrations (Khentii and Darkhan aimags and Altanbulag, Bayangol, Eroo, Javkhlant, Zuunburen, Mandal, Orkhon, Saikhan, Sant, Khuder, Khushaat, Shaamar, Darkhan, Orkhon, Hongor, Shariingol soums) and the Khan khentii darkhan tsaazat gazar strict protected area and Gorkhi Terelj National Park.

9. Onon-Balj priority area

- Carry out mapping and inventory of the peatlands as intersectoral object of the middle flow catchment of the Onon and the Uldz rivers, including within the area of Onon-Balj National Park.
- Include peatlands as water objects in the water cadastre of respective aimags (Khentii and Dornod).
- Monitor and manage forest fires, improve the infrastructure and capacity of local administrations (Khentii and Dornod aimags and Umnudelger, Batshireet, Binder, Bayan-Adraga, Dadal, Bayan-Uul, Norovlin, Batnorov soums) and administration of Onon-Balj national park for fire prevention and control.
- Assess the effectiveness of the Onon-Balj National Park and Ramsar site “Lakes in the Khurkh-Khuiten river valley” for peatlands conservation. To integrate peatland conservation, protection and monitoring tasks in the management plans of the above-mentioned protected areas.
- To develop awareness material on the peatlands of the Onon-Balj and Uldz catchment and include information on the natural and social values of peatlands in the awareness programs of the regional administrations (Khentii and Dornod aimags and Umnudelger, Batshireet, Binder, Bayan-Adraga, Dadal, Bayan-Uul, Norovlin, Batnorov soums), Onon-Balj National Park and Ramsar site “Lakes in the Khurkh-Khuiten river valley” and Crane Research Station in Khurkh valley and tour operators dealing with ecological tourism.
- Organize permanent monitoring of the status of permafrost, hydrology and peatland characteristics (water regime, carbon turnover, biodiversity status, including all groups of animals, plants and vegetation) in the Ramsar site “Lakes in the Khurkh-Khuiten river valley.”
- Carry out a study and comprehensive modelling of the hydrological regime of the Onon, Balj, Yeroo and middle Uldz catchment in order to include peatlands into integrated river basin management scheme.
- Carry out a spatial assessment of peatlands capacity to host agriculture without losses. Provide recommendations for spatial distribution of different agriculture uses of peatlands.
- Introduce methods for sustainable agriculture, including fertilizer-free agriculture, spatial turnover of agriculture lands with different uses and peatland restoration concepts for pastures.
- Assess the impact of tourism on peatlands and introduce sustainable solutions for organising peatland related tourism, especially birdwatching.



10. Tesiin gol priority area

- Carry out mapping and inventory of the peatlands as intersectoral objects of the middle flow catchment of the Tesiin river.
- Include peatlands as water objects in the water cadastre of respective aimags (Khentii and Dornod).
- Organize permanent monitoring of permafrost status, hydrology and peatland characteristics (water regime, carbon turnover, biodiversity status including all groups of animals, plants and vegetation) at several points along the Tesiin river valley as a research project to support pasture management.
- Carry out a study and comprehensive modelling of the hydrological regime of the Tesiin river catchment in order to include peatlands into integrated river basin management scheme.
- Carry out a comprehensive socio-economic and environmental study of the pasturing economy and its impacts on the ecosystems, including relation to permafrost and water cycle, and covering a cost-benefit analysis with relation to climate change driven incentives
- Carry out a spatial assessment of the capacity of peatlands to host agriculture without losses. Provide recommendations for the spatial distribution of different agricultural uses of peatlands.
- Produce clear recommendations for administrations (Khentii and Dornod aimags and Burentogtokh, Tsagaan-Uul, Tsetserleg, Shine-Ider, Ikh-Uul soums) for sustainable peatlands/ pasture management in the area based on scientific knowledge and community discussions, including the spatial turnover of agriculture lands with different uses and peatland restoration concept for pastures.
- Consider gazetting a strict protected area in the Bulnay range plateau to protect the remaining peatlands there as a source of water, carbon and biodiversity; to consider protected status for several lowland lakes.
- Develop awareness materials on the peatlands of the Tesiin catchment and include information on the natural and social values of peatlands in the awareness programs of regional administrations (Khentii and Dornod aimags and Burentogtoh, Tsagaan-Uul, Tsetserleg, Shine-Ider, Ikh-Uul soums), local herders, connected enterprises and consumers of downstream production (cashmere, meat, milk products).





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