



A Selection of Sustainable Land Management Best Practices from Mongolia



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Food and Agriculture
Organization of the
United Nations

Sustainable Forest Management Impact Program on
DRYLAND SUSTAINABLE LANDSCAPES



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**Authors:**

Mandakh Nyamtseren (United Nations Development Programme in Mongolia)
Tserendulam Tseren-Ochir (Knowledge Management for the GEF-7 Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes in Mongolia)
Undarmaa Dagvasuren (United Nations Development Programme in Mongolia)
Otgontsetseg Davaanyam (Institute of Geography and Geoecology, Mongolian Academy of Sciences)
Jonas Chastonay (Centre for Development and Environment, University of Bern, and WOCAT)
Nicole Harari (Centre for Development and Environment, University of Bern, and WOCAT)

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World Overview of Conservation Approaches and Technologies (WOCAT) Secretariat
Centre for Development and Environment (CDE)
University of Bern
Mittelstrasse 43
3012 Bern, Switzerland
Email: wocat.cde@unibe.ch
Website: www.wocat.net

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Cover page: front: Khoovriin Spring after installation of a livestock-exclusion fence. UNDP Mongolia, ADAPT Project. back: Landscape of the Eastern Steppe, Mongolia. Jonas Chastonay.

Table of contents

Acknowledgement	7
Foreword	9
1 Introduction	11
2 The World Overview of Conservation Approaches and Technologies (WOCAT) and Mongolia	13
3 WOCAT Documentation and Publication Process	18
4 Conclusion	16
SLM Approaches and Technologies Summaries	21

Most SLM practices in this publication are currently documented in English, with a Mongolian translation forthcoming. The full and continually updated collection is available at the link below.

Энэхүү хэвлэлд багтсан ихэнх ГТМ-ийн технологи, арга барил нь одоогоор англи хэлээр баримтжуулагдсан бөгөөд монгол орчуулгыг үе шаттайгаар бэлтгэн нийтлэх болно. Монгол Улсад баримтжуулсан ГТМ-ийн туршлагуудын бүрэн эх бөгөөд тогтмол шинэчлэгдэх мэдээллийг доорх холбоосоор үзнэ үү.



<https://wocat.net/en/database/list/?country=mn>

Acknowledgement

We wish to acknowledge the invaluable contributions of the land users implementing sustainable land management (SLM) technologies and approaches in Mongolia, sharing SLM knowledge, and advancing sustainable land use and restoration of degraded lands.

The SLM technologies and approaches presented in this publication were compiled using WOCAT Questionnaires by FAO Mongolia and WWF Mongolia, under the Global Environment Facility (GEF)-7 financed *Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes (DSL-IP)*, and by UNDP, under the Green Climate Fund (GCF) financed *Improving Adaptive Capacity and Risk Management of Rural Communities in Mongolia (ADAPT)* project.

We are grateful to the WOCAT Secretariat, whose support was instrumental at every stage – from training the data compilers, through review and editing, to uploading the completed documentation to the WOCAT Global SLM Database.

We further acknowledge the support and cooperation of the various administrations, institutions, and agencies that assisted during data compilation in the field, and we extend particular thanks to the national experts who contributed so substantially to validating the SLM technologies and approaches.



H.E. Mr. Sandag-Ochir Tsend, Minister of Environment
and Climate Change of Mongolia

Foreword

Mongolia is a nation shaped by its rangelands. Across the steppe and the Gobi, generations of herders have built their lives, livelihoods and culture upon the health of the land. Today, however, this foundation is under growing pressure. Unsustainable grazing pressure, increasingly frequent and severe drought and dzud events, and the accelerating impacts of climate change are intensifying land degradation and desertification across Mongolia's fragile steppe and Gobi ecosystems. These pressures threaten the ecological balance that has sustained pastoral life for centuries.

For Mongolia, rangeland degradation is not simply an environmental concern. Healthy rangelands underpin our food security, rural economy and resilience to climate shocks. They also sustain the pastoral traditions that remain central to our national identity. When rangelands deteriorate, the consequences are felt first by herder households and local communities, but ultimately affect the country as a whole.

It is within this context that I welcome the publication of this compendium, "A Selection of Sustainable Land Management Best Practices from Mongolia". For many years, valuable knowledge and experience related to sustainable land management have remained dispersed among herders, researchers, local practitioners and institutions. This publication brings that knowledge together in a consolidated reference, presenting well-documented sustainable land management approaches and technologies from across Mongolia.

This compendium builds upon a long-standing and valuable partnership between WOCAT and Mongolia. WOCAT's contribution has extended well beyond the documentation of sustainable land management practices. Through close cooperation between the WOCAT team and Mongolian scientists and institutions, important foundations were established for understanding, assessing and systematically organizing national knowledge on land degradation and desertification. A notable achievement of this collaboration was the development of Mongolia's first national atlas on desertification in 2013. This pioneering work helped strengthen the scientific evidence base, improve the spatial understanding of desertification processes, and support more informed land management policies and decisions.

A particular strength of the present publication is its integration of traditional knowledge with scientific research and practical innovation. Alongside time-tested herding and pasture management practices passed down through generations, it presents conservation approaches and technologies developed through research and field

experience. Each practice has been documented using the standardized methodology of the World Overview of Conservation Approaches and Technologies (WOCAT). This ensures that the information is systematic, comparable and practical – supporting land users and communities in selecting appropriate practices while helping policymakers and development partners identify effective solutions for investment, replication and scaling up.

"A Selection of Sustainable Land Management Best Practices from Mongolia" is intended to be a living resource. It can be continuously expanded as additional practices are documented, assessed and validated, enabling it to reflect Mongolia's evolving knowledge and experience in sustainable land management. In doing so, it will contribute directly to the country's efforts to achieve Land Degradation Neutrality, strengthen resilience to climate change, conserve biodiversity, and restore the health and productivity of its rangelands, forests and other ecosystems. These commitments are central to Mongolia's national environmental policies and to its implementation of the United Nations Convention to Combat Desertification.

I extend my sincere appreciation to WOCAT, the Centre for Development and Environment at the University of Bern, and all Mongolian scientists, institutions, practitioners and herder communities whose knowledge, dedication and cooperation have made this compendium possible. Their sustained partnership has contributed greatly to building a shared and systematic understanding of land degradation, desertification and sustainable land management in Mongolia.

I hope that "A Selection of Sustainable Land Management Best Practices from Mongolia" will be widely used by herders, national and local authorities, researchers, educational institutions, civil society organizations and development partners. Above all, I hope it will inspire stronger collaboration and practical action to protect and sustainably manage Mongolia's land for present and future generations, while sharing the country's knowledge and experience with the wider region and the international community.



H.E. Mr. Sandag-Ochir Tsend
Minister of Environment and Climate Change
of Mongolia

1 Introduction

Mongolia is a landlocked country covering approximately 1.56 million km² and extending across the transition from the Siberian taiga to the Central Asian steppe and desert regions. Its pronounced continental climate is characterized by large seasonal and daily temperature variations and strong spatial differences in precipitation. Annual precipitation generally decreases from the northern mountain and forest-steppe regions towards the southern Gobi, creating highly diverse but predominantly dryland ecosystems. Much of the country lies above 1,000 metres, and its ecological conditions range from mountain taiga and forest steppe to steppe, desert steppe and desert landscapes (Yembuu, 2021).

These ecosystems support distinctive forms of land use and rural livelihoods. Extensive livestock production remains closely connected to Mongolia's rangelands, while forests, croplands, wetlands and oasis ecosystems provide essential ecological services and support local economies. Mobile and flexible grazing strategies have historically enabled pastoral communities to respond to the high spatial and temporal variability of forage and water resources. Mongolia is also periodically affected by dzud, a severe winter livestock disaster in which animals may be unable to access sufficient forage or survive because of combinations of extreme cold, deep or compacted snow, ice cover, preceding drought and poor livestock condition.

Land degradation and desertification are among Mongolia's most pressing environmental and development challenges. National and regional studies have documented substantial spatial variation in the extent, severity and drivers of desertification and land degradation across Mongolia's ecological zones. The evidence indicates that observed degradation results from interacting climatic variability, increasing aridity and land use pressures rather than from a single driver (Nyamtseren et al., 2018; Dorjsuren et al., 2025). According to most recent assessments,

approximately 77.8 percent of Mongolia's territory is affected by desertification and land degradation to varying degrees (Dorjsuren et al., 2025). This figure should be understood as the outcome of a national desertification and land degradation assessment rather than as a uniform condition across the entire country.

The forms, intensity and drivers of degradation differ considerably among Mongolia's ecological zones. In parts of the forest-steppe zone, important pressures include forest disturbance, agricultural land use and concentrated grazing. In the dry steppe, vegetation decline, soil disturbance and locally excessive grazing pressure are prominent concerns, while wind erosion, vegetation loss and sand movement are particularly important in desert-steppe and desert environments. A comparative study of representative soums across the forest-steppe, dry-steppe and desert-steppe zones demonstrated that land cover changes between 1985 and 2022 followed different trajectories according to ecological conditions, climate variability and land use pressures (Dorjsuren et al., 2025).

Long-term spatial analysis also shows that vegetation change cannot be attributed to human activity without considering climatic variability, observation period and ecosystem characteristics. Earlier national and satellite-based assessments helped identify areas of degradation and regeneration and contributed to distinguishing changes associated with climatic variation from potentially human-induced trends (Eckert et al., 2015). More recent research using Landsat imagery and machine-learning methods for the Ügii Lake watershed demonstrated substantial redistribution among grassland types between 1990 and 2024, reflecting the combined influence of climatic and anthropogenic factors. The study achieved overall classification accuracies above 94 percent and illustrates the growing role of remote sensing and advanced analytical tools in monitoring Mongolia's changing grasslands (Nyamtseren et al., 2025).

Photos: left: Protection of the four spring resources that feed the Ulz River, using the design and technology of the Buryat sheepfold model. Norovlin soum, Khentii Province, Mongolia. Uuganbayar Munkhabat. right: White naped crane, Bayan-Ovoo soum, Khentii province, Mongolia. Uuganbayar Munkhabat.



Socioeconomic and institutional changes have also influenced rangeland use. Following the transition of the early 1990s, livestock were privatized while most pastureland remained under state ownership and common use. In many areas, the weakening of collective management arrangements, changing access to services and markets, and growing concentration of households and livestock around settlements, roads and water points contributed to reduced mobility and more continuous use of some seasonal pastures (Fernandez-Gimenez, 2006). Grazing pressure is therefore not spatially uniform: heavily used areas may occur alongside more remote or less accessible pastures that receive relatively little use.

Other land uses also contribute to degradation. Conversion of rangelands to cropland, deforestation and fuelwood collection, inadequate rehabilitation of mining-affected land, infrastructure expansion and poorly planned settlement and road development can increase soil erosion, vegetation loss and landscape fragmentation (Wang et al., 2022). These pressures interact with drought, rising temperatures, changing precipitation regimes and extreme events, making it difficult to separate climatic and human influences without integrated field and spatial assessment.

Addressing these challenges requires sustainable land management (SLM) approaches adapted to Mongolia's ecological diversity and institutional context. SLM encompasses the use of land resources to produce goods and provide services to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions. In Mongolia, this includes maintaining pastoral mobility and seasonal grazing arrangements, reducing concentrated pressure on vulnerable pastures, protecting soil and water resources, improving livestock and forage management, restoring degraded land, managing forests sustainably and rehabilitating land affected by mining and infrastructure.

Local knowledge and scientific evidence both have important roles in this process. Herders' knowledge of seasonal pasture conditions, livestock behaviour, water availability and climatic risks provides information that may not be captured by satellite imagery or periodic field surveys. Scientific monitoring, ecological assessment, remote sensing and spatial analysis can, in turn, help identify longer-term changes, compare areas and support planning at soum, aimag and national levels. Effective land management therefore depends on combining these forms of knowledge through participatory assessment, co-management and adaptive decision-making.

The SLM technologies and approaches presented in this publication illustrate how land users, researchers, local authorities, civil society organizations and development partners are responding to these challenges. They include both traditional practices adapted through generations of experience and newer approaches developed through research, projects and local innovation. By documenting these practices through the standardized WOCAT methodology, the publication seeks to make Mongolia's practical knowledge more accessible, comparable and useful for land users, policymakers, researchers and development partners.

The compilation does not imply that every documented practice is suitable for replication in all locations. The effectiveness of an SLM technology or approach depends on climate, soils, topography, land use, labour and financial requirements, local institutions and the priorities of land users. The documented practices should therefore be understood as evidence-informed options that require local assessment and adaptation. Together, they contribute to Mongolia's efforts to prevent and reduce land degradation, restore degraded ecosystems, strengthen climate resilience and advance Land Degradation Neutrality (LDN) under the United Nations Convention to Combat Desertification (UNCCD).

Photos: left and right: Diverse landscapes of Mongolia. Rima Mekdaschi-Studer.



2 The World Overview of Conservation Approaches and Technologies (WOCAT) and Mongolia

About WOCAT

Established in 1992, the World Overview of Conservation Approaches and Technologies (WOCAT – www.wocat.net) is a global network dedicated to documenting, sharing and applying knowledge that supports adaptation, innovation, and decision-making in SLM. As a pioneer in transformative SLM action, the network creates an innovative platform for sharing and scaling good practices that address land degradation, climate change and biodiversity loss. Furthermore, WOCAT supports countries in participatory processes for mapping land degradation and estimating SDG indicator 15.3.1, including the three Land Degradation Neutrality (LDN) sub-indicators, through the development of LDN Decision Support Systems (LDN DSS).

WOCAT provides standardized, user-driven, open-access tools and methods, used globally, for documenting and assessing SLM practices. Within the WOCAT framework, SLM is defined as the use of land resources to produce goods and provide services to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions. WOCAT focuses on efforts to prevent and reduce land degradation and to restore degraded land through improved land management technologies and the approaches used to implement them.

The WOCAT Global SLM Database was officially recognized by the UNCCD in 2014 as the primary recommended Global Database for SLM best practices. Today, the WOCAT Global SLM Database contains over 2,000 SLM practices published from more than 100 countries, including Mongolia. It enables knowledge sharing and analysis at the local, national, regional, and global levels, clarifying which good practices work where, how, and why, along with their associated costs and benefits.

The UNCCD recognition gives WOCAT the mandate to support Country Parties to the UNCCD in documenting their own SLM best practices, using the UNCCD-recommended WOCAT Global SLM Database, and applying the SLM knowledge worldwide, i.e. from land users to decision-makers, to improve local land management.

WOCAT in Mongolia

Since 2008, WOCAT has collaborated with Mongolian scientists, government institutions, universities, development partners and civil society organizations to strengthen the assessment, documentation and exchange of knowledge on land degradation, desertification and SLM.

This cooperation began as a flagship activity of the Swiss Agency for Development and Cooperation-funded *Coping with Desertification Project (CODEP)*. Under the project, the Desertification Study Centre of the Institute of Geology at the Mongolian Academy of Sciences worked closely with WOCAT to document Mongolia's traditional and innovative SLM technologies and approaches. This collaboration led to the establishment of MONCAT, a national repository of good SLM practices, and the publication of *Technologies and Approaches of Soil and Water Conservation in Mongolia*, which presented selected practices for addressing land degradation and desertification (Khaulenbek, 2008).

The partnership between WOCAT and Mongolian scientists extended well beyond the documentation of individual SLM technologies and approaches. It contributed to establishing a more systematic framework for assessing and understanding land degradation and desertification at the national level. By bringing together international assessment approaches and Mongolian research institutions' scientific expertise, field observations and spatial data, the cooperation supported analysis of the extent, severity and geographical distribution of degradation processes across Mongolia's diverse ecological zones.

A major outcome of this wider cooperation was the publication of Mongolia's first national desertification atlas in 2013 (Tsogtbaatar & Khudulmur, 2013). The atlas brought together scientific findings, field-based assessments and geospatial information to present a nationally consistent picture of desertification and land degradation. It identified areas affected by, or vulnerable to, degradation;

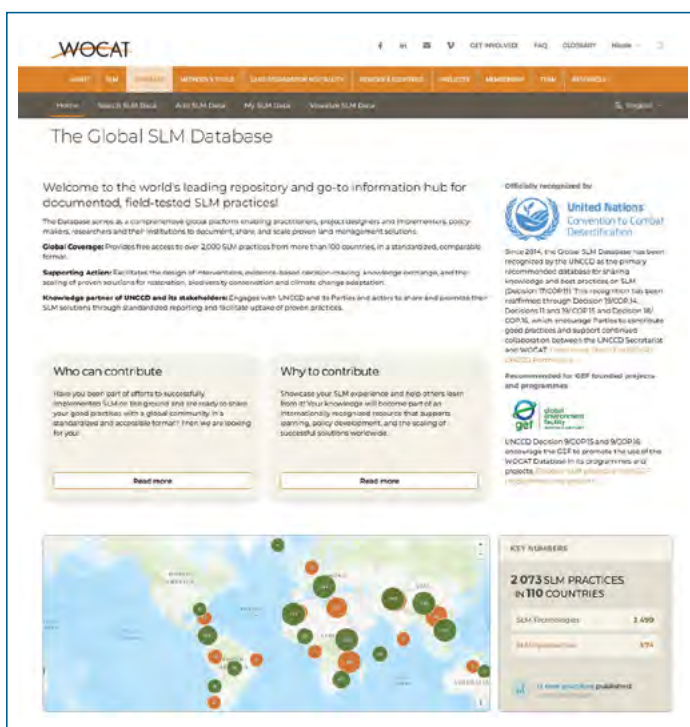


Figure 1. The WOCAT Global SLM Database.

illustrated regional differences in its severity and underlying drivers; and communicated complex scientific findings through accessible maps and spatial analyses.

The atlas marked an important transition from fragmented studies and site-specific observations towards a more integrated national assessment. It provided researchers, policymakers, land management authorities and development partners with a shared evidence base for identifying priority areas, targeting interventions and incorporating land degradation concerns into national and local planning. More broadly, the joint work strengthened national capacity in degradation assessment, spatial analysis and knowledge management. Building on this broader body of collaborative research, satellite-based analysis of MODIS vegetation trends provided further evidence of the spatial patterns of land degradation and regeneration in Mongolia and helped distinguish climatic influences from human-induced changes (Eckert et al., 2015). This scientific foundation continues to inform Mongolia's efforts to prevent and reduce land degradation, restore affected landscapes and implement its commitments under the UNCCD.

To make WOCAT's tools more accessible to national users, its questionnaires for documenting SLM technologies and approaches were translated into Mongolian. This enabled researchers and practitioners to document good practices directly in the national language and broadened participation in developing Mongolia's SLM knowledge base.

More recently, the *Sustainable Forest Management Impact Program on Dryland Sustainable Landscapes (DSL-IP)* has supported renewed capacity development and knowledge exchange. Training activities introduced WOCAT's documentation methodology to researchers and practitioners from the Institute of Geography and Geoecology, the National University of Mongolia, the Mongolian University of Life Sciences, the NGO JASIL, and the Agency for Land Administration and Management, Geodesy and Cartography. Delivered jointly by WOCAT, FAO and IUCN through the DSL-IP Communities of Practice, the training combined instruction on WOCAT questionnaires with practical field-documentation exercises. These activities were complemented by peer-learning initiatives, including the Drylands School held in Ulaanbaatar in July 2025

and a field study tour to the southern Gobi. They enabled Mongolian practitioners and local decision-makers to exchange knowledge and experience with representatives of other DSL-IP countries.

WOCAT documentation has also been integrated into major UNDP-supported projects in Mongolia to capture field-level results and facilitate the wider adoption of effective practices. Under the GEF-financed *Ensuring Sustainability and Resilience of Green Landscapes in Mongolia (ENSURE)* project, sustainable rangeland and forest management practices piloted with herder communities in the Sayan and Khangai Mountains and the southern Gobi are being documented using the WOCAT methodology. This is building an evidence base for replicating successful practices in landscapes with comparable ecological and socioeconomic conditions.

Similarly, the GCF financed *Improving Adaptive Capacity and Risk Management of Rural Communities in Mongolia (ADAPT)* project uses WOCAT to document adaptive grazing and rangeland management practices developed with herder communities in Khovd, Zavkhan, Dornod and Sukhbaatar aimags. This process helps transform site-level experience into practical knowledge that can be adopted by other herder groups, local authorities and development programmes.

Before publication in the WOCAT Global SLM Database, draft technologies and approaches from Mongolia undergo national technical review. Experts from research institutions, universities and relevant government agencies assess the technical accuracy, completeness and national relevance of each entry. The documentation is then submitted to WOCAT for further review and publication. This process helps ensure that Mongolia's contributions reflect credible, well-documented and field-based experience.

As a result of these sustained partnerships, numerous Mongolian SLM technologies and approaches have been published in both Mongolian and English. Together, they form a growing body of practical knowledge for land users, researchers, policymakers and development partners working to prevent and reduce land degradation, restore degraded landscapes and strengthen the

Photos: left: Floodplain afforestation and rehabilitation of sparse forests. ADAPT project. right: Promoting SLM and biodiversity conservation in the Eastern Steppe of Mongolia. DSL-IP.



resilience of Mongolia's rangelands and other ecosystems. All published SLM practices from Mongolia are freely accessible through the link:
<https://wocat.net/en/database/list/?country=mn>.

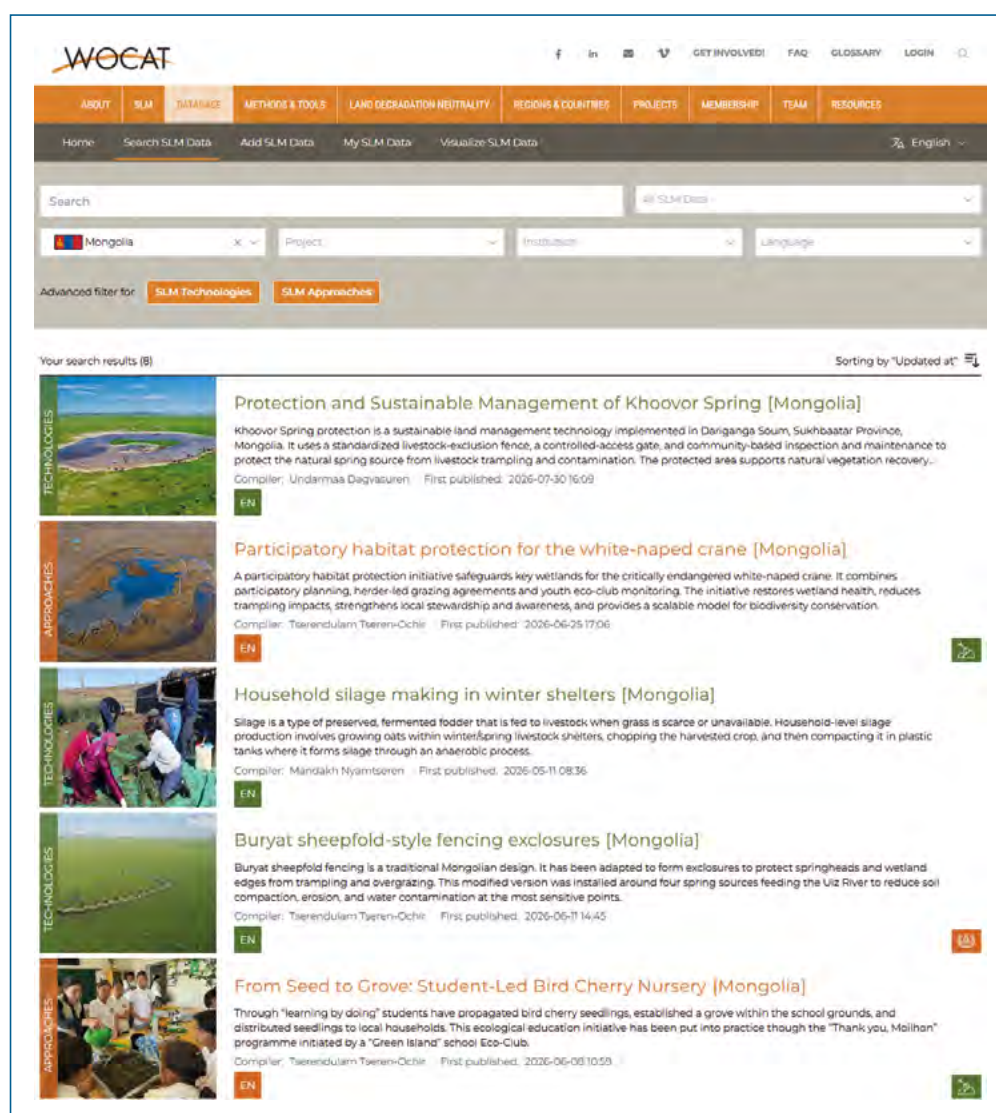


Figure 2. Screenshot from the WOCAT Global SLM Database, showing a selected number of SLM practices from Mongolia.

Photos: left: 45 ha nursery for the production of tree seedlings used for ecological restoration and supporting Mongolia's One Billion Trees National Movement, Dalanzadgad soum, Umnugovi aimag. right: Agroforestry research demo farm (AF parc) in Dalanzadgad, Umnugovi aimag. Rima Mekdaschi-Studer.



3 WOCAT Documentation and Publication Process

Short introduction to the WOCAT documentation

The WOCAT documentation follows a standardized participatory process using two main questionnaires to capture either SLM technologies (the physical practices on the land that control land degradation) or SLM approaches (the ways and means used to implement one or more SLM technologies). It comprises five stages: (1) training, (2) collection of data in the field from and with land users, (3) data validation and entry into the WOCAT Global SLM Database, (4) technical and editorial review, and (5) publication.

All information documented through the WOCAT SLM technologies and approaches questionnaires (<https://wocat.net/en/database/slm-practices-technologies-and-approaches/>) is made publicly available in the WOCAT Global SLM Database, where it serves to disseminate SLM knowledge and improve decision-making for the further implementation and spread of SLM practices at the local, national, and global levels.

Training

Before fieldwork begins, those who will carry out the documentation are trained on the WOCAT questionnaires and Global SLM Database. Sessions familiarize participants with WOCAT tools and methods, the structure of the SLM questionnaires, the linkage to UNCCD PRAIS reporting, and the key terminology used in the process. This shared understanding helps ensure consistency across documentation teams and data entries.

Collection of data in the field from and with land users

Ahead of field work, some sections of the questionnaires can be pre-filled, using existing knowledge and documents. In parallel, land users and other key resource persons, such as local extension officers and researchers with in-depth knowledge of the practice, are identified and contacted, and coordination with local authorities is established to secure support. In the field, teams gather information through interviews using the questionnaires with land users and resource persons, take measurements and photographs, and produce technical drawings.

Data validation and entry into the WOCAT Global SLM Database

Once field documentation and initial editing by team leaders are complete, the data is validated by a wider group of experts. This step confirms the technical accuracy and completeness of the information before it is submitted to the WOCAT Global SLM Database, helping to ensure the data meets agreed quality standards. All compiled and validated data, including photographs and drawings, is then entered into the WOCAT Global SLM Database.

Technical and editorial review

Dedicated WOCAT reviewers conduct an official review of the submitted practices to ensure data quality, consistency, and credibility. The reviewers approve the documentation or request improvement based on the quality of the data collected and can edit the language to improve understandability. If a reviewer requests improvements, the SLM technology or approach is revised and resubmitted for another round of review (cyclical process).

Photos: left: Tree-multiplication and restoration site showing the difference between protected and unprotected areas, Umnugovi aimag; right: SLM documentation in the field. Rima Mekdaschi-Studer.



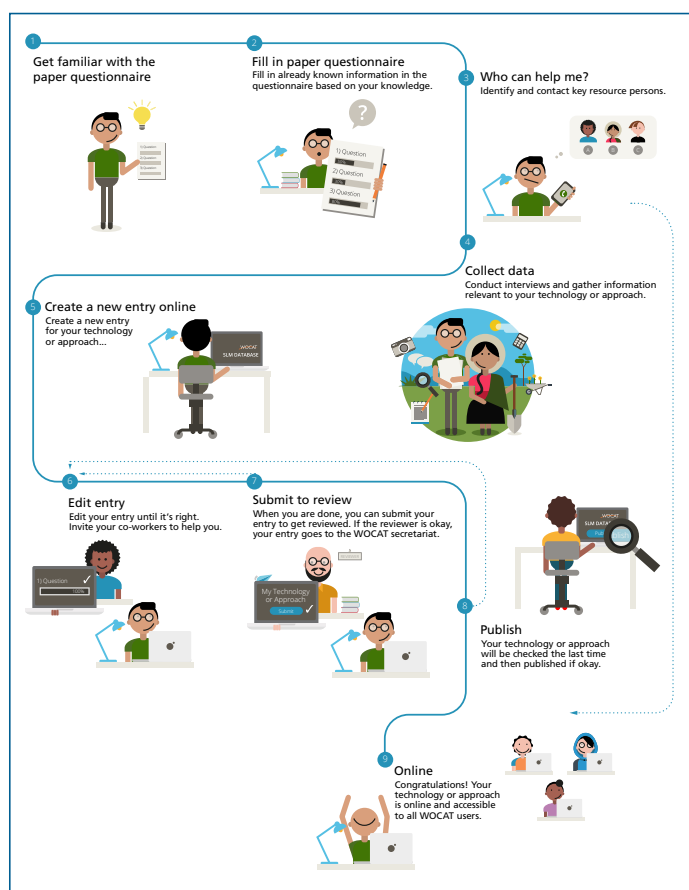


Figure 3: Documentation, Review and Publication Process of WOCAT.

Publication

Before publication, a final, formal review is done by the WOCAT Secretariat. Once an SLM technology/approach is approved, it is published on the WOCAT Global SLM Database under open access.

The key terms and their definitions, as used by WOCAT, are:

SLM – The use of land resources to produce goods and provide services to meet changing human needs, while simultaneously ensuring the long-term productive potential of these resources and the maintenance of their environmental functions.

SLM approach – An SLM approach defines the ways and means used to implement one or several SLM technologies. It includes technical and material support, as well as involvement and roles of different stakeholders, etc. An approach can refer to a project/programme or to activities initiated by land users themselves.

SLM technology – An SLM technology is a practice applied in the field that controls land degradation and/or enhances productivity. It consists of one or several measures, such as agronomic, vegetative, structural, and management measures.

Roles of:

Compiler – The compiler is responsible for the data entry and can invite editors (WOCAT users) to help create it. Once the data entry is complete, the compiler can submit it for review.

Editor – Editors can edit the SLM technology/approach, but they cannot submit it for review or invite other editors.

Reviewer – The reviewer can approve or reject the SLM technology/approach and can edit it.

WOCAT Secretariat – The WOCAT Secretariat can review and publish the SLM technology/approach. The Secretariat can also assign reviewers.

Photos: left: Tree propagation and multiplication suited to the region's harsh conditions where trees are established in the prepared furrows between raised soil ridges, Umnugovi aimag. Rima Mekdaschi-Studer; right: Aerial view of the Elsentsarkhai Research and Experimental Station for Desertification Mitigation. UNDP Mongolia.



4 Conclusion

Mongolia's rangelands, forests, agricultural lands, and wet- and dryland ecosystems are increasingly affected by climate change, drought, unsustainable land use and growing pressure on natural resources. SLM is therefore essential for protecting land productivity, strengthening the resilience of rural livelihoods and supporting Mongolia's commitments to combat desertification and achieve Land Degradation Neutrality (LDN).

This publication brings together selected SLM technologies and approaches documented through the standardized WOCAT methodology. Its value lies not only in presenting successful practices, but also in recording the different perspectives of land users, herders, researchers, local authorities, practitioners and development partners. A practice that appears technically effective may have different implications in terms of labour, cost, maintenance, local acceptance, ecological suitability and institutional support. Documentation from multiple perspectives therefore helps explain not only what works, but also where, for whom, under what conditions and with what limitations.

The present compilation is not comprehensive. Many traditional practices, locally developed innovations, restoration experiences and project-supported technologies across Mongolia have yet to be fully documented, reviewed and published. It is therefore important that this publication remains a living resource that is periodically updated as additional practices are identified, assessed and validated. WOCAT's open and standardized system provides a strong foundation for expanding Mongolia's national knowledge base and sharing its experience internationally.

The next step is to develop WOCAT in Mongolia as a living, continuously updated national resource rather than a one-time publication. Additional practices should be documented in both Mongolian and English, existing entries should be periodically reviewed, and stronger links should be established with national land monitoring, universities, extension systems, local governments and development programmes. The publication itself already recognizes that the collection should continue to expand as practices are documented, assessed and validated.

Future success will depend on the quality of the underlying documentation. Emerging digital technologies, including artificial intelligence, could strengthen data management by organizing and comparing large numbers of practices, supporting translation, flagging incomplete records, and linking WOCAT entries with climate, soil, land-cover and monitoring data. However, AI cannot compensate for missing field evidence, weak validation or the absence of land-user perspectives. The priority must therefore remain the careful documentation of practices from multiple viewpoints, using common standards while preserving local context.

By combining participatory documentation, scientific validation, open access, geospatial information and responsible AI, Mongolia can build a stronger bridge between local experience and national policy. It can also contribute practical knowledge to the wider global effort to combat desertification, land degradation and drought. The long-term value of this work will be measured not by the number of practices stored in a database, but by whether documented knowledge is used to improve decisions, support land users, guide investment and restore the ecological functions and human livelihoods that depend on healthy land.

Photo: Representatives of local residents and herders who actively participated in the process of constructing the 'Buryat Sheepfold' model enclosure in Norovlisoum, Khentii province, Mongolia. Uuganbayar Munkhbat.



References

- Dorjsuren A, Tsetsegmaa G, Nyamtseren M, Sharav S. 2025. Desertification and land degradation problems in soums in different natural regions of Mongolia. *Mongolian Journal of Geography and Geoecology* 62(46):182–189. <https://doi.org/10.5564/mjgg.v62i46.4255>
- Eckert S, Hüsler F, Liniger H, Hodel E. 2015. Trend analysis of MODIS NDVI time series for detecting land degradation and regeneration in Mongolia. *Journal of Arid Environments* 113:16–28. <https://doi.org/10.1016/j.jaridenv.2014.09.001>
- Fernandez-Gimenez ME. 2006. Land use and land tenure in Mongolia: a brief history and current issues. In: Bedunah DJ, McArthur ED, Fernandez-Gimenez ME, compilers. *Rangelands of Central Asia: Proceedings of the Conference on Transformations, Issues, and Future Challenges*; 27 January 2004; Salt Lake City, UT. Proceeding RMRS-P-39. Fort Collins, CO: US Department of Agriculture, Forest Service, Rocky Mountain Research Station. pp. 30–36. <https://research.fs.usda.gov/treesearch/22866>
- Khaulenbek A, editor. 2008. *Technologies and Approaches of Soil and Water Conservation in Mongolia*. Ulaanbaatar, Mongolia: Institute of Geoecology. 100 pp. ISBN 978-99929-934-2-1. https://eic.mn/dldbase/upload/2012/tadesertbook/1/20121217_6209_1.pdf
- Nyamtseren M, Feng Q, Deo RC. 2018. A comparative study of temperature- and precipitation-based aridity indices and their trends in Mongolia. *International Journal of Environmental Research* 12:887–899. <https://doi.org/10.1007/s41742-018-0143-6>
- Nyamtseren M, Pham TD, Vu TTP, Navaandorj I, Shoyama K. 2025. Mapping vegetation changes in Mongolian grasslands (1990–2024) using Landsat data and advanced machine learning algorithm. *Remote Sensing* 17(3), Article 400. <https://doi.org/10.3390/rs17030400>
- Tsogtbaatar J, Khudulmur S, editors. 2013. *Desertification Atlas of Mongolia*. Ulaanbaatar, Mongolia: Institute of Geoecology, Mongolian Academy of Sciences; Environmental Information Centre, Ministry of Environment and Green Development. ISBN 978-99973-0-197-0.
- Wang Z, Ma Y, Zhang Y, Shang J. 2022. Review of Remote Sensing Applications in Grassland Monitoring. *Remote Sens.* 14:2903. <https://doi.org/10.3390/rs14122903>
- Yembuu B. 2021. General geographical characteristics of Mongolia. In: Yembuu B, editor. *The Physical Geography of Mongolia*. Cham, Switzerland: Springer International Publishing. pp. 1–8. https://doi.org/10.1007/978-3-030-61434-8_1

Photo: Field visit of good SLM practices overseen by the desertification center. More than 20 types of anti-desertification trees propagated and planted to combat dust storms, Bulgan soum, Umnugovi aimag. Rima Mekdaschi-Studer.



SLM Approaches and Technologies Summaries

In the following section of this publication, selected SLM technologies and approaches are presented in the summary format that is automatically generated from the WOCAT Global SLM Database.

This table provides an overview of the SLM technologies and their related approaches.

TECHNOLOGIES		APPROACHES	
Buryat sheepfold-style fencing exclosures	p. 23	Participatory habitat protection for the white-naped crane	p. 33
Conservation agriculture to restore abandoned cropland	p. 37	Mentorship programme on conservation agriculture	p. 47
Producing wild cherry seedlings in a schoolyard nursery	p. 53	From Seed to Grove: Student-Led Bird Cherry Nursery	p. 59
Household silage making in winter shelters	p. 67		
Protection and Sustainable Management of Khoovor Spring	p. 75		
		Gender responsive capacity building and mentoring for climate-resilient rural livelihoods	p. 81
		Traditional Seasonal Mobility of Zereg Pastoralists	p. 89



Protection of the four spring sources that feed the Ulz River using the design and technology of the Buryat sheepfold model. (Uuganbayar Munkhbat)

Buryat sheepfold-style fencing exclosures (Mongolia)

Буриад хонин загварын хашаа

DESCRIPTION

Buryat sheepfold fencing is a traditional Mongolian design. It has been adapted to form exclosures to protect springheads and wetland edges from trampling and overgrazing. This modified version was installed around four spring sources feeding the Ulz River to reduce soil compaction, erosion, and water contamination at the most sensitive points.

Buryat sheepfold-style fencing is a traditional Mongolian design. It has been modified to protect sensitive wetlands and adjacent grazing lands of semi-nomadic pastoralists (who have horses, cattle, sheep, goats and camels), where concentrated livestock pressure at water points causes soil compaction, erosion, pollution and loss of wetland buffering capacity. In its adapted form it is a nature-friendly barrier that forms an exclosure to protect springheads, streams and wetland margins. This type of modified Buryat-style fencing has been implemented around four spring sources that feed the Ulz River in Norovlin soum, Khentii aimag, in the semi-arid eastern steppe where rainfall is low and temperatures fluctuate widely.

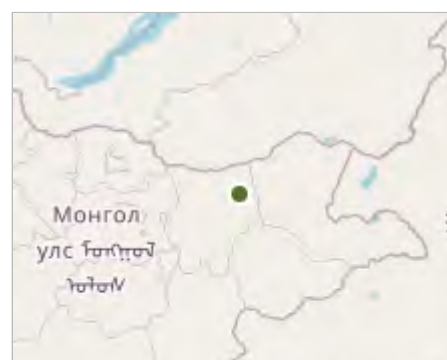
The adapted fencing is nail-free and “no-dig”: thus, it minimizes disturbance to soil and vegetation. Metal posts (about 1.5–1.6 m high) are fixed into portable concrete bases (approx. 20 cm × 40 cm). Wooden poles (about 1.5–2.0 m long) are prepared from locally sourced timber (usually from fallen or aged trees). Notches are carved into the pole ends so they interlock securely with the metal cores without brackets. The fence is built with a zigzag design to improve stability. The modular structure can be expanded, reduced or relocated as wetland edges shift seasonally. In the documented case study, three structures surround a total area of 3.6 ha.

The purposes of such fencing are to: (i) physically exclude livestock and people from the most vulnerable spring-shed area; (ii) reduce erosion and sedimentation; (iii) improve surface water quantity and quality; (iv) stabilize wetland vegetation and habitat; and (v) support reliable water supply for households and livestock while helping to conserve biodiversity - including migratory waterfowl.

Key activities include participatory site selection and agreement on protected zones and access points; collection/processing of timber; casting and transporting concrete bases; manual installation of posts and poles; and signage/awareness to reinforce rules. Maintenance is carried out by residents through regular inspections, re-securing sections after damage, and replacing worn poles or bases. Long-term performance depends on clear responsibilities, cost-sharing and a stable financing mechanism.

Herders report improved river/spring water levels and quality (project monitoring indicated around 20 % improvement in spring water level) and more dependable watering points, alongside increased vegetation cover and reduced evaporation/erosion near springheads. The fenced areas provide safer habitat conditions for wildlife and have been associated with increased sightings of migratory waterfowl. Socially, protecting water sources has helped reduce disputes over access.

LOCATION



Location: Norovlin soum, Khentii aimag, Mongolia

No. of Technology sites analysed: 2 – 10 sites

Geo-reference of selected sites:

- 111.710898, 48.527500
- 111.711448, 48.525886
- 111.718222, 48.523115
- 111.717398, 48.522580

Spread of the Technology: applied at specific points/ concentrated on a small area (0.036 km²)

In a permanently protected area?: No

Date of implementation: 2023

Type of introduction

- ☐ through land users' innovation
- ☐ as part of a traditional system (> 50 years)
- ☐ during experiments/ research
- ☒ through projects/ external interventions

Land users value the locally buildable and movable design and the improvements in water reliability. Concerns include the ongoing labour and costs for repairs, and the need for stronger local policies and monitoring to sustain the system over the long term.



The process of building a Buryat sheep fence (Uuganbayar Munkhbat)



Representatives of local residents and herders who actively participated in the process of constructing the "Buryat Sheepfold" model enclosure. (Uuganbayar Munkhbat)

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- ☐ improve production
- ☒ prevent, reduce land degradation; restore/rehabilitate land
- ☒ conserve ecosystem
- ☒ protect a watershed/ downstream areas – in combination with other Technologies
- ☒ preserve/ improve biodiversity
- ☐ reduce risk of disasters
- ☒ adapt to climate change/ extremes and its impacts
- ☐ mitigate climate change and its impacts
- ☐ create beneficial economic impact
- ☐ create beneficial social impact

Purpose related to land degradation

- ☐ prevent land degradation
- ☒ reduce land degradation
- ☒ restore/ rehabilitate severely degraded land
- ☐ adapt to land degradation
- ☐ not applicable

SLM group

- area closure (stop use, support restoration)
- surface water management (spring, river, lakes, sea)
- wetland protection/ management

Land use

Land use mixed within the same land unit: No



Grazing land

- Nomadism
 - Semi-nomadic pastoralism
- Animal type: camels, cattle - dairy and beef (e.g. zebu), goats, horses, sheep
- Is integrated crop-livestock management practiced? No

Species	Count
cattle - dairy and beef (e.g. zebu)	38 640
horses	21 730
sheep	109 580
goats	65 970
camels	110



Waterways, waterbodies, wetlands

- Swamps, wetlands

Water supply

- ☒ rainfed
- ☐ mixed rainfed-irrigated
- ☐ full irrigation

Degradation addressed



physical soil deterioration Pc: compaction, Ps: subsidence of organic soils, settling of soil



biological degradation Bc: reduction of vegetation cover, Bq: quantity/ biomass decline, Bs: quality and species composition/ diversity decline



water degradation Ha: aridification, Hs: change in quantity of surface water

SLM measures



structural measures S6: Walls, barriers, palisades, fences

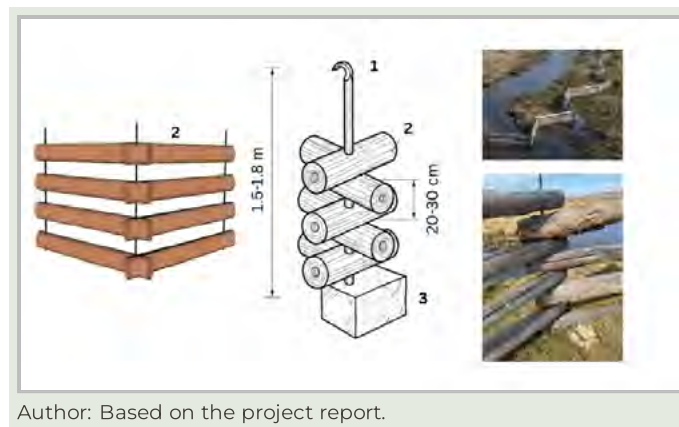


management measures M2: Change of management/ intensity level

TECHNICAL DRAWING

Technical specifications

1. Fence height range: 1.5–1.6 m
2. Pole length range: 1.5–2.0 m
3. Concrete base size: 20 cm × 40 cm



Author: Based on the project report.

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated: per Technology unit (unit: **fence** volume, length: **50m**)
- Currency used for cost calculation: **tugrug**
- Exchange rate (to USD): 1 USD = 3550 tugrug

Most important factors affecting the costs

The establishment and maintenance costs are primarily driven by the procurement and long-distance transportation of metal posts and concrete bases to remote steppe locations with poor road access, and the logistics of seasonal construction and inspection in a harsh semi-arid climate with limited windows for work and occasional need for repair materials after extreme weather events. These cost drivers can be significantly reduced by maximizing the use of locally sourced

Establishment activities

1. Meeting with local authorities, community members, relevant organizations, and land users. (Timing/ frequency: Autumn to spring)
2. Site selection and assessment (Timing/ frequency: Spring)
3. Fence selection and construction testing (Timing/ frequency: Spring)
4. Construction of the fence foundation (Timing/ frequency: Spring)
5. Installation of metal posts and wooden structures (Timing/ frequency: Spring)
6. Securing structural components of fence (Timing/ frequency: Spring)
7. Final inspection and testing of stability (Timing/ frequency: Spring)
8. Monitoring and evaluation of functionality (Timing/ frequency: Regular inspections (daily checks))

Establishment inputs and costs (per fence)

Specify input	Unit	Quantity	Costs per Unit (tugrug)	Total costs per input (tugrug)	% of costs borne by land users
Labour					
Hired skilled technicians	person-days	8	50 000.00	400 000.00	0
Community voluntary labour	person-days	200	20 000.00	4 000 000.00	100
Equipment					
truck rental for material delivery	days	6	30 000.00	180 000.00	0
mini-van for team transport	days	6	20 000.00	120 000.00	0
concrete production	days	5	30 000.00	150 000.00	100
Construction material					
Metal posts (1.5–1.6 m galvanised)	piece	25	25 000.00	625 000.00	0
Cement	kg	250	4 500.00	1 125 000.00	0
Wooden poles (1.5–2 m from permitted fallen/aged trees, incl. collection)	piece	100	12 000.00	1 200 000.00	0
Total costs for establishment of the Technology (tugrug)				7 800 000.00	
<i>Total costs for establishment of the Technology in USD</i>				<i>2 197.18</i>	

Maintenance activities

1. Inspection of the integrity of the fence. (Timing/ frequency: Monthly)
2. Repairing damaged or weakened sections (Timing/ frequency: As needed, after inspections)

Maintenance inputs and costs (per fence)

Specify input	Unit	Quantity	Costs per Unit (tugrug)	Total costs per input (tugrug)	% of costs borne by land users
Labour					
Community voluntary labour – monthly inspections (4 sites) + simple repairs	person-days	250	1 000.00	250 000.00	100

Equipment

4×4 vehicle / truck rental for access and minor material transport

days

4

60 000.00

240 000.00

100

Construction material

Total costs for maintenance of the Technology (tugrug)

1 430 000.00

Total costs for maintenance of the Technology in USD

402.82

Specify input	Unit	Quantity	Costs per Unit (tugrug)	Total costs per input (tugrug)	% of costs borne by land users
Spare wooden poles	piece	20	12 000.00	240 000.00	100
Spare metal posts	piece	20	25 000.00	500 000.00	100
Other					
Fuel, community coordination	lump sum	1	200 000.00	200 000.00	99

Total costs for maintenance of the Technology (tugrug)

1 430 000.00

Total costs for maintenance of the Technology in USD

402.82

NATURAL ENVIRONMENT

Average annual rainfall

- ☐ < 250 mm
- ☒ 251 – 500 mm
- ☐ 501 – 750 mm
- ☐ 751 – 1 000 mm
- ☐ 1 001 – 1 500 mm
- ☐ 1 501 – 2 000 mm
- ☐ 2 001 – 3 000 mm
- ☐ 3 001 – 4 000 mm
- ☐ > 4 000 mm

Agro-climatic zone

- ☐ humid
- ☒ sub-humid
- ☐ semi-arid
- ☐ arid

Specifications on climate

Average annual rainfall in mm: 293.6

The area is located in the eastern steppe region of Mongolia, characterized by a low annual rainfall of 200-280 mm, which is typical for the semi-arid and arid climate of the region.

Name of the meteorological station: Bayan-Ovoo meteorological station in Khentii province /Bayan-Ovoo urtuu/ :
station: <https://shorturl.at/sD8ik>

The region is located in the eastern steppe of Mongolia, with an annual rainfall of 200-280 mm and temperature variations ranging from +25°C in July to -25°C in January. The growing period is relatively short due to the low precipitation and cold winters, fitting the characteristics of a semi-arid zone.

Slope

- ☐ flat (0-2%)
- ☒ gentle (3-5%)
- ☐ moderate (6-10%)
- ☐ rolling (11-15%)
- ☐ hilly (16-30%)
- ☐ steep (31-60%)
- ☐ very steep (>60%)

Landforms

- ☒ plateau/plains
- ☐ ridges
- ☐ mountain slopes
- ☐ hill slopes
- ☐ footslopes
- ☐ valley floors

Altitude

- ☐ 0 – 100 m a.s.l.
- ☐ 101 – 500 m a.s.l.
- ☒ 501 – 1 000 m a.s.l.
- ☐ 1 001 – 1 500 m a.s.l.
- ☐ 1 501 – 2 000 m a.s.l.
- ☐ 2 001 – 2 500 m a.s.l.
- ☐ 2 501 – 3 000 m a.s.l.
- ☐ 3 001 – 4 000 m a.s.l.
- ☐ > 4 000 m a.s.l.

Technology is applied in

- ☐ convex situations
- ☐ concave situations
- ☒ not relevant

Soil depth

- ☒ very shallow (0-20 cm)
- ☒ shallow (21-50 cm)
- ☐ moderately deep (51-80 cm)
- ☐ deep (81-120 cm)
- ☐ very deep (> 120 cm)

Soil texture (topsoil)

- ☐ coarse/ light (sandy)
- ☒ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Soil texture (> 20 cm below surface)

- ☐ coarse/ light (sandy)
- ☒ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Topsoil organic matter content

- ☒ high (>3%)
- ☐ medium (1-3%)
- ☐ low (<1%)

Groundwater table

- ☐ on surface
- ☐ < 5 m
- ☒ 5 – 50 m
- ☐ > 50 m

Availability of surface water

- ☐ excess
- ☒ good
- ☐ medium
- ☐ poor/ none

Water quality (untreated)

- ☒ good drinking water
 - ☐ poor drinking water (treatment required)
 - ☐ for agricultural use only (irrigation)
 - ☐ unusable
- Water quality refers to: both ground and surface water

Is salinity a problem?

- ☒ Yes
- ☐ No

Occurrence of flooding

- ☒ Yes
- ☐ No

Species diversity

- ☒ high
- ☐ medium
- ☐ low

Habitat diversity

- ☒ high
- ☐ medium
- ☐ low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation

- ☐ subsistence (self-supply)
- ☒ mixed (subsistence/ commercial)
- ☐ commercial/ market

Off-farm income

- ☐ less than 10% of all income
- ☒ 10-50% of all income
- ☐ > 50% of all income

Relative level of wealth

- ☐ very poor
- ☒ poor
- ☒ average
- ☐ rich
- ☐ very rich

Level of mechanization

- ☒ manual work
- ☐ animal traction
- ☒ mechanized/ motorized

Sedentary or nomadic

- ☐ Sedentary
- ☒ Semi-nomadic
- ☒ Nomadic

Individuals or groups

- ☒ individual/ household
- ☐ groups/ community
- ☐ cooperative
- ☒ employee (company, government)

Gender

- ☒ women
- ☒ men

Age

- ☐ children
- ☒ youth
- ☒ middle-aged
- ☐ elderly

Area used per household

- ☐ < 0.5 ha
- ☐ 0.5 – 1 ha
- ☐ 1 – 2 ha
- ☒ 2 – 5 ha
- ☐ 5 – 15 ha
- ☐ 15 – 50 ha
- ☐ 50 – 100 ha
- ☐ 100 – 500 ha
- ☐ 500 – 1 000 ha
- ☐ 1 000 – 10 000 ha
- ☐ > 10 000 ha

Scale

- ☐ small-scale
- ☒ medium-scale
- ☐ large-scale

Land ownership

- ☒ state
 - ☐ company
 - ☐ communal/ village group
 - ☐ individual, not titled
 - ☐ individual, titled
 - ☐ other
- Nomadic herding culture

Land use rights

- ☐ open access (unorganized)
- ☒ communal (organized)
- ☐ leased
- ☐ individual

Water use rights

- ☐ open access (unorganized)
- ☒ communal (organized)
- ☐ leased
- ☐ individual

Access to services and infrastructure

health	poor	☒	good
education	poor	☒	good
technical assistance	poor	☒	good
employment (e.g. off-farm)	poor	☒	good
markets	poor	☒	good
energy	poor	☒	good
roads and transport	poor	☒	good
drinking water and sanitation	poor	☒	good
financial services	poor	☒	good

IMPACTS**Socio-economic impacts**

drinking water availability	decreased	☐	☐	☐	☒	increased
drinking water quality	decreased	☐	☐	☐	☒	increased
water availability for livestock	decreased	☐	☐	☐	☒	increased
water quality for livestock	decreased	☐	☐	☐	☒	increased
workload	increased	☐	☒	☐	☐	decreased

The water level of the Ulz River has significantly improved due to the protection of the four springs that feed the river.

The reduction in human and livestock trampling on the springheads that feed the Ulz River has led to decreased pollution and a significant improvement in water quality.

The improvement in the water quality and flow of the Ulz River has led to an increase in the water levels for livestock in the region.

The improvement in the water quality and flow of the Ulz River has led to better water quality for livestock in the region.

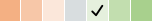
There was significant voluntary involvement from local residents in the construction of the fence, and there is a positive trend in their continued voluntary participation in maintaining the long-term stability of the fence. This is linked to the strong awareness of the local community regarding the protection of the natural environment of their homeland.

Socio-cultural impacts

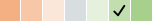
land use/ water rights	worsened	☐	☐	☐	☒	improved
SLM/ land degradation knowledge	reduced	☐	☐	☐	☒	improved

The protection of the sources that feed the Ulz River through fencing has reduced degradation and pollution caused by human and livestock activities, improving water quality, utilization, and accessibility. As a result, this initiative has enhanced the local residents' rights to more accessible and sustainable use of water resources in the long term.

The successful implementation of the water source protection project with the involvement of local residents and the establishment of mutual monitoring have highlighted the importance of voluntary participation. Providing knowledge and training on topics such as the significance of citizens' involvement in environmental and ecosystem protection has improved their understanding and laid the foundation for active participation. This has contributed to enhancing their knowledge and engagement in the project, ensuring its long-term sustainability.

conflict mitigation	worsened  improved	The reduction in water pollution and improved accessibility has significantly decreased the issues and disputes, leading to more effective outcomes in the long term.
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Ecological impacts

water quantity	decreased  increased	By protecting the water source, the water resources of the Ulz River have been increased, playing a crucial role in maintaining the stability of the water flow.
water quality	decreased  increased	By protecting the springs that feed the Ulz River from external negative impacts and livestock trampling, water pollution has decreased, and water quality has significantly improved.
evaporation	increased  decreased	The stability of the water level, based on the increased vegetation cover and soil moisture, has led to a reduction in soil water evaporation.
soil moisture	decreased  increased	The stability of the water level, along with the increased vegetation cover, has become a contributing factor in enhancing soil moisture.
soil cover	reduced  improved	Improvement in soil moisture and vegetation cover will enhance the fertility of the topsoil in the long term.
soil loss	increased  decreased	With the increase and stabilization of vegetation cover and soil moisture, the risk of soil erosion from wind and water on the topsoil has been reduced, creating conditions for soil protection.
soil compaction	increased  reduced	Human activities and livestock trampling around the water source have caused a significant reduction in soil compaction and pressure.
vegetation cover	decreased  increased	The stable soil moisture and increased plant cover, protected from external degradation, will enhance soil stability.
animal diversity	decreased  increased	The increase in water resources and quality has improved the living conditions of wildlife near the river. As water conditions improved, the stability of the ecosystem enhanced, creating favorable conditions for wildlife dependent on the aquatic environment.
drought impacts	increased  decreased	The improvement in water resources and quality will have a long-term positive impact on reducing the effects of drought.
micro-climate	worsened  improved	The improvement in water levels and quality, along with reduced soil erosion, will positively impact the long-term stability of the local ecosystem, contributing to the stabilization of temperature and humidity.

Off-site impacts

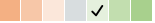
water availability	decreased  increased	By protecting the water source, water quality and levels improve, creating conditions for more free-flowing and efficient water flow.
reliable and stable stream flows in dry season	reduced  increased	As a result of improved water levels and quality, the availability of water resources for use during dry seasons has increased, positively impacting the reduction of water scarcity risks.
groundwater/ river pollution	increased  reduced	The improvement in the quality of the Ulz River's water has played a crucial role in enhancing the quality of the groundwater recharge process, which is vital for creating a more effective and sustainable water resource in the long term. As the water quality improves, the level of pollution entering the groundwater decreases, thereby increasing the opportunities to preserve and use the water source.

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns	very negative  very positive
Long-term returns	very negative  very positive

Benefits compared with maintenance costs

Short-term returns	very negative  very positive
Long-term returns	very negative  very positive

Although the initial installation costs may seem high, the long-term ecological and socio-economic benefits are substantial.

CLIMATE CHANGE

Climate-related extremes (disasters)

extreme winter conditions	not well at all	   	very well
drought	not well at all	   	very well
general (river) flood	not well at all	   	very well
landslide	not well at all	   	very well
epidemic diseases	not well at all	   	very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

-  single cases/ experimental
-  1 – 10 %
-  11 – 50 %
-  > 50 %

Number of households and/ or area covered

More than 15 households participated.

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

-  0 – 10 %
-  11 – 50 %
-  51 – 90 %
-  91 – 100 %

Has the Technology been modified recently to adapt to changing conditions?

-  Yes
-  No

To which changing conditions?

-  climatic change/ extremes
-  changing markets
-  labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- The fence is very easy to build, expand, move or repair without using nails or digging into the ground, so it does not damage the soil and can be adjusted quickly whenever needed.
- After fencing, we clearly observed stronger and more stable spring flows even in dry periods, and the water became cleaner because livestock no longer trample and pollute the spring areas.
- It reduces arguments among herders over water access and saves time fetching water from distant places, making daily life easier for families and animals.
- We are now very interested in building the same fence around other springs that we have seen drying up or becoming dirty earlier, because we see it really works.

Strengths: compiler's or other key resource person's view

- The technology successfully integrates traditional Buryat/Mongolian knowledge with modern low-impact conservation principles, achieving a nail-free, no-dig, fully modular and relocatable design that causes zero soil disturbance and is highly reversible.
- It delivers measurable ecological benefits (≈20% increase in spring water quantity and quality within 1–2 years, vegetation recovery, reduced trampling-induced erosion and compaction, improved wetland buffering) while protecting critical recharge zones that feed the Ulz River and support downstream ecosystems.
- Strong community ownership and spontaneous replication interest among herders demonstrate excellent social acceptability, adoption potential and scalability to other degrading spring sites in semi-arid eastern Mongolia.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- The fence needs regular checking and repair after strong winds, heavy snow, or when animals push against it, but sometimes there is not enough time or people available to fix it quickly. — Form a small herder group with a clear schedule for monthly checks and share repair responsibilities among households; train young people so knowledge is not lost when elders move or are busy.
- In the beginning, collecting enough good fallen wood from the forest takes a lot of effort and needs official permission, which can be slow or difficult. — Work together with the local soum administration and forest officers to get permits faster and identify permitted collection areas in advance; explore using alternative local materials (if permitted) for minor repairs.
- If the fence is damaged and not fixed right away, livestock can enter again and the spring protection is lost, which makes all the previous work useless. — Keep a small stock of spare slats and fasteners at the soum centre or with a trusted herder family; agree on quick emergency repair rules within the community so someone can respond fast.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- High initial procurement and transport costs of metal posts and concrete bases in remote eastern steppe locations with poor road infrastructure and seasonal access constraints. — Pre-manufacture and stockpile concrete bases at the nearest soum centre; negotiate bulk procurement through local government or conservation projects; maximise use of locally collected fallen wood to reduce dependence on expensive transported materials.
- Risk of insufficient long-term monitoring and maintenance due to lack of dedicated funding and formal institutional responsibility after project support ends. — Establish a multi-stakeholder management committee (herders, soum administration, aimag environment department, NGO) with annual work plans, clear roles, and a small revolving fund; integrate monitoring into existing local environmental reporting systems.
- Limited scalability if replication depends solely on external project funding and technical guidance; risk of uneven quality if new groups copy the design without proper training. — Develop a simple Mongolian-language manual/video guide (with photos of each step) and train local facilitators/herder leaders to teach others; promote farmer-to-farmer exchanges between soums to build a self-sustaining replication network.

REFERENCES

Compiler

Tserendulam Tseren-Ochir

Editors

Mandakh Nyamtseren
Munkhbat Uuganbayar
Munkhchuluun Basan
Rima Mekdaschi Studer
Sodnomdarjaa Enkhjargal

Reviewers

Jonas Chastonay
William Critchley

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Last updated 2026-06-11

Resource persons

Tserendulam Tseren-Ochir - co-compiler
Munkhbat Uuganbayar - SLM specialist
Mandakh Nyamtseren - Editor

Full description in the WOCAT database

<https://wocat.net/en/database/technologies/7446/>

Linked SLM data

Approaches: Participatory habitat protection for the white-naped crane <https://wocat.net/en/database/approaches/7445/>



Restored wetland environment from the drone (Uuganbayar Munkhbat)

Participatory habitat protection for the white-naped crane (Mongolia)

Цэн тогорууны амьдрах орчныг хамтын оролцоотой хамгаалах нь

DESCRIPTION

A participatory habitat protection initiative safeguards key wetlands for the critically endangered white-naped crane. It combines participatory planning, herder-led grazing agreements and youth eco-club monitoring. The initiative restores wetland health, reduces trampling impacts, strengthens local stewardship and awareness, and provides a scalable model for biodiversity conservation.

A participatory approach was established to protect the habitat of the critically endangered white-naped crane (*Grus vipio*) in Mongolia's eastern steppe. The focus is on safeguarding vital wetlands. This initiative began in 2024 at the source of the Ulz River in Norovlin soum, Khentii province and covers an area of 1.2 ha. It addresses issues of degradation caused by overgrazing and trampling in grassland regions with 200-280 mm of annual rainfall. Distinct features include strong community involvement through voluntary labour and maintenance, grazing plans that support herder livelihoods, integration of Eco-Clubs for education and monitoring, and science-based site selection methodology. The approach also provides scalable model for habitat restoration based on biodiversity conservation and climate-resilient land management.

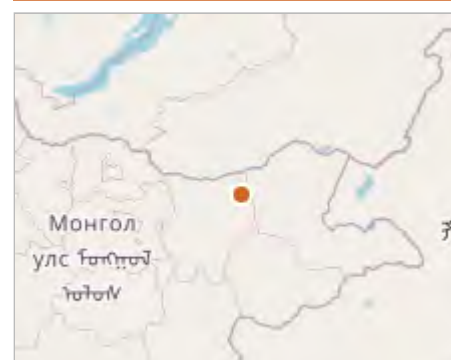
The main objective is to restore a safe habitat for cranes to boost their population. This is achieved through rehabilitating wetlands - thus improving vegetation, soil, and water quality. Enhanced biodiversity and ecosystem services should result. Simultaneously the approach aims to increase local awareness, promote eco-tourism and reduce conflicts - and to align the initiative with national policies. Methods included participatory workshops including planning, selection of the protection strategy, participatory community labour and monitoring. The methodology also involves ecological surveys and adaptive management planning conducted by researchers. In this case there was also a local science fair with bird ecologists, and bird observation programmes led by students from school Eco-Clubs.

The implementation stages were: 1) Stocktaking - from scientific surveys and a local science fair; 2) Planning and approval - through participatory workshops, consultations, permits, site assessment, and grazing agreements; 3) Fence construction - with herder involvement; 4) Monitoring and handover - after baseline surveys and training; 5) Ongoing engagement - including inspections, repairs, and awareness activities. Stakeholders (5-6 people) consist of local government, bagh (sub-administrative unit of soum) administrators, herders, students from school Eco-Clubs, researchers, and the river basin administration.

The local government oversaw coordination and issuing permits. The bagh chief worked on raising awareness and mobilization. Herders contributed voluntary labour, monitored activities, and ensured compliance with grazing regulations. School Eco-Clubs, which include teachers and students, participated in bird monitoring and organized science fairs. Researchers supplied baseline data and scientific insights on the significance of bird conservation and habitat sustainability. The River Basin Administration remains responsible for ensuring adherence to the management plan. The WWF Mongolia Dryland project provided seed funding, technical assistance, and training.

Land users rejoice in the return and breeding of cranes: "We brought the crane back - it

LOCATION



Location: Norovlin soum, Khentii aimag, Mongolia

Geo-reference of selected sites:

- 111.972417, 48.723702

Initiation date: 2024

Type of Approach

- traditional/ indigenous
- recent local initiative/ innovative
- ✓ project/ programme based

feels like our own protected home.” One crane pair returned and bred within a single season. The visible success has created social prestige, reinforced traditional respect for wildlife, and strengthened community identity as stewards of nature. Also appreciated are the recovery of ecosystems, improved access to water for livestock, and increased youth involvement. Land users value the participatory approach that honours traditional practices. Inclusiveness built strong ownership and long-term commitment.



Meeting and training for Implementing the fencing plan for the selected area (Source from Mr. Uuganbayar Munkhbat)



Meeting and training for Implementing the fencing plan for the selected area (Source from Mr. Uuganbayar Munkhbat)

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims/ objectives of the Approach

The initiative aims to conserve the white-naped crane's habitat by securing safe nesting and breeding conditions and reducing damaging pressures such as livestock trampling and disturbance from domestic animals. It also seeks to restore and sustain the Ulz River wetland ecosystem by improving soil, water, and vegetation quality, maintaining ecological balance, and protecting biodiversity. In parallel, it strengthens community stewardship through awareness raising, local participation in planning and implementation, and long-term monitoring and maintenance to ensure lasting sustainability.

Conditions enabling the implementation of the Technology/ ies applied under the Approach

- **Social/ Cultural/ Religious Norms And Values:** Strong traditional respect for wildlife and communal resource stewardship in Mongolian herder culture. Youth engagement via eco-clubs.
- **Availability/ Access To Financial Resources And Services:** Substantial one-time funding and technical support for establishment phase from the WWF Mongolia “Promoting Dryland Sustainable Landscapes and Biodiversity Conservation in the Eastern Steppe” project
- **Institutional Setting:** Strong support and coordination from local government (e.g. soum administration) and River Basin Administration (Onon-Ulz river basin administration), including permits and organizational backing.
- **Collaboration/ Coordination Of Actors:** Excellent multi-stakeholder cooperation between local government, herder households, school eco-clubs, researchers, and WWF Mongolia, resulting in high voluntary participation and rapid implementation.
- **Legal Framework (Land Tenure, Land And Water Use Rights):** Fully supported by Mongolia's Law on Environmental Protection, wildlife conservation legislation, and communal open-access pasture rights that allow community-led protection measures.
- **Knowledge About SLM, Access To Technical Support:** Knowledge-sharing sessions, trainings and meetings built capacity; researchers and eco-clubs support monitoring; WWF supported trainings/public events.

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Availability/ Access To Financial Resources And Services:** Long-term sustainability of funding is uncertain; reliance on external project support may limit future expansions or routine maintenance without integration into local budgets.
- **Institutional Setting:** Limited institutional capacity for ongoing oversight of maintenance and enforcement after project handover; staff rotation may weaken continuity.
- **Legal Framework (Land Tenure, Land And Water Use Rights):** Lack of strong enforcement mechanisms for ongoing compliance with grazing restrictions and fence maintenance.
- **Knowledge About SLM, Access To Technical Support:** Long-term financial/other challenges may limit sustained training/awareness; risk of lacking technical support/expertise over time.
- **Workload, Availability Of Manpower:** Difficulties during intensive livestock periods (calving, hay-making) when herders' workload is highest, potentially delaying maintenance activities.

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local land users/ local communities	Local land users and communities, including farmers and herders	They were involved in the planning phase and participated in the construction of the protective fence and will be involved in monitoring and ensuring the integrity of the protective fence in the long term.
SLM specialists/ agricultural advisers	The Onon-Ulz River Basin Administration	Conduct monitoring and research on the protection efforts for the source of the Ulz River.
researchers	Biologists, ornithologist and environmental ranger	Conducting research on local biodiversity, monitoring the population of white-naped cranes, and assessing the ecological impact of the fence construction project. During the

		science fair, they also presented the latest findings of conservation research on the white-naped crane including specific measures for protection which can be implemented by the community.
teachers/ school children/ students	Teachers and students of the local high schools Eco clubs in Norovlin soum	They participated in activities such as raising public awareness about the importance of constructing protective fencing, engaging in bird-watching programs, and conducting research.
local government	Experts, representatives, and decision-makers from the government and relevant professional organizations.	Providing information on whether the initiative complies with legal frameworks, local environmental policies, and land-use regulations, as well as granting permissions and support for project implementation. This also includes ensuring the collaborative participation of local communities and other stakeholders, and establishing mechanisms for long-term monitoring and maintenance.
international organization	Experts from the "Promoting Dryland Sustainable Landscapes and Biodiversity Conservation in the Eastern Steppe of Mongolia" project, implemented by the World Wildlife Fund (WWF) Mongolia	They provided the necessary professional and financial support for the successful implementation of the project from its initial stages. Additionally, they organized training and public events to raise awareness among local residents and ensure community involvement.

Involvement of local land users/ local communities in the different phases of the Approach

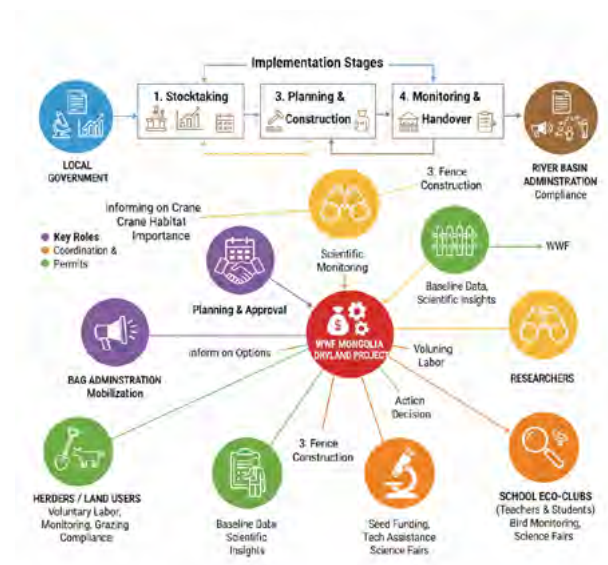
	none passive external support interactive self-mobilization	
initiation/ motivation	✓	The initiative to implement the project for protecting the habitat of the white-naped crane and building a protective fence began with a public meeting for local residents, herders, and representatives of professional organizations. During this meeting, information was provided about the importance of the project and its potential outcomes, which was a crucial step in gaining support and increasing engagement from the local stakeholders.
planning	✓	The work plan was developed based on the involvement, requests, and experiences of all participating parties.
implementation	✓	Voluntary participation in the construction of the fence, as well as in future monitoring and maintenance, has been established with the participation of local herders and residents.
monitoring/ evaluation	✓	The local residents have established the conditions to regularly maintain, repair, and monitor the protective fence through their collective efforts.

Flow chart

Visual summary of the Approach. The top section outlines a linear workflow from stocktaking and planning to monitoring and handover, involving entities like local governments and river basin administrations. The central hub connects various groups (including herders, researchers, and school eco-clubs) to specific roles such as providing voluntary labor, baseline data, and scientific insights for crane habitat protection.

Author

Uuganbayar Munkhbat



Decision-making on the selection of SLM Technology

Decisions were taken by

- ☐ land users alone (self-initiative)
- ☐ mainly land users, supported by SLM specialists
- ☒ all relevant actors, as part of a participatory approach
- ☐ mainly SLM specialists, following consultation with land users
- ☐ SLM specialists alone
- ☐ politicians/ leaders

Decisions were made based on

- ☐ evaluation of well-documented SLM knowledge (evidence-based decision-making)
- ☒ research findings
- ☐ personal experience and opinions (undocumented)

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ☒ Capacity building/ training
- ☒ Advisory service
- ☒ Institution strengthening (organizational development)
- ☒ Monitoring and evaluation
- ☒ Research

Capacity building/ training

Training was provided to the following stakeholders

- ☒ land users
- ☒ field staff/ advisers

Form of training

- ☒ on-the-job
- ☐ farmer-to-farmer
- ☒ demonstration areas
- ☒ public meetings
- ☐ courses

Subjects covered

- Construction and maintenance of fencing
- Monitoring and protection of white-naped crane habitats
- Sustainable land management practices related to wildlife protection

Advisory service

Advisory service was provided

- ☒ on land users' fields
- ☒ at permanent centres

Provided advisory services on the construction, maintenance, and monitoring of the fence.

Institution strengthening

Institutions have been strengthened / established

- ☐ no
- ☐ yes, a little
- ☒ yes, moderately
- ☐ yes, greatly

at the following level

- ☒ local
- ☐ regional
- ☐ national

Describe institution, roles and responsibilities, members, etc.

The project was implemented with the collaborative involvement of the local government, the Onon-Ulz River Basin Authority, eco-clubs of local secondary schools, local environmental experts, and local residents.

Type of support

- ☐ financial
- ☒ capacity building/ training
- ☒ equipment

Further details

This work was implemented with the support of the "Promoting Dryland Sustainable Landscapes and Biodiversity Conservation in the Eastern Steppe of Mongolia" project.

Monitoring and evaluation

The involvement of local residents and other stakeholders in monitoring the integrity of the protective fence served as the foundation for ensuring long-term sustainability and benefits. In addition, the crane population (number of cranes in the protected area) is monitored. The documents, field reports, and activity logs collected during the project are used for monitoring and evaluation purposes. They are crucial for assessing the progress of the project and identifying areas that require improvement.

Research

Research treated the following topics

- ☐ sociology
- ☐ economics / marketing
- ☒ ecology
- ☐ technology

The local relevant organizations are monitoring the impact on the ecosystem and the increase in the number of biological species, particularly the population of the White-naped crane. These include Wildlife Science and Conservation Center (WSCC) of Mongolia and Mongolian Bird Conservation Center (MBCC), prominent NGOs focusing on avian research, conservation, and community engagement

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- ☐ < 2 000
- ☐ 2 000 – 10 000
- ☒ 10 000 – 100 000
- ☐ 100 000 – 1 000 000
- ☐ > 1 000 000

59 715 000 MNT for all cost funded by Promoting Dryland Sustainable Landscapes and Biodiversity Conservation in the Eastern Steppe of Mongolia project.

The following services or incentives have been provided to land users

- ☒ Financial/material support provided to land users
- ☒ Subsidies for specific inputs (including labour)
- ☐ Credit
- ☒ Other incentives or instruments

Financial/material support provided to land users

Land users received fencing materials. WWF Mongolia provided financial support for the construction of fences, their extension, and ongoing maintenance, as well as for monitoring activities. Additionally, funds were allocated for training, meetings, and field construction activities.

Subsidies for specific inputs

	partly financed	fully financed
equipment : machinery The necessary equipment for building and installing a fence.	☐	☒
equipment : tools Materials for the fence, transportation costs, and other related expenses.	☐	☒
construction : Fencing material Fully supported to purchase galvanized metal frame.	☐	☒
Labour by land users was		
☒ voluntary		
☐ food-for-work		
☐ paid in cash		
☐ rewarded with other material support		

Other incentives or instruments

Meetings and training sessions to ensure the active participation of local residents and stakeholders.

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

	No	Yes, little	Yes, moderately	Yes, greatly
Did the Approach empower local land users, improve stakeholder participation? Semi-nomadic herders took voluntary ownership of fence construction, monthly inspections and maintenance. Eco-club students (next generation) actively participate in bird monitoring. Multi-stakeholder meetings ensured inclusive decision-making from planning to handover. Local pride in crane return strongly reinforced participation.	☐	☐	☐	☒
Did the Approach enable evidence-based decision-making? Baseline crane & vegetation surveys (researchers + eco-clubs), ongoing bird observations and fence integrity checks provide data for adaptive management.	☐	☐	☒	☐
Did the Approach help land users to implement and maintain SLM Technologies? Training and meetings ensured voluntary labour to implement technology and community-led maintenance. Compensatory grazing planning supporting long-term compliance.	☐	☐	☐	☒
Did the Approach improve coordination and cost-effective implementation of SLM? Excellent coordination between soum government, basin administration, WWF, researchers, eco-clubs and herders. One-time WWF funding (59.7 million MNT) leveraged high voluntary labour and low net cost per hectare.	☐	☐	☐	☒
Did the Approach mobilize/ improve access to financial resources for SLM implementation? The crane habitat protection plan ensures the resource mobilization in longer term.	☐	☒	☐	☐
Did the Approach improve knowledge and capacities of land users to implement SLM? On-the-job training during fence building, public awareness campaigns raised SLM understanding among herders and youth. In addition, the science fairs supported by researchers have built capacities of eco-clubs.	☐	☐	☐	☒
Did the Approach improve knowledge and capacities of other stakeholders? Local government & basin staff gained experience in community-based wetland protection. The results of the community-led monitoring is not available yet but such citizen science may benefit science community to enlarge data and data sources.	☐	☐	☒	☐
Did the Approach build/ strengthen institutions, collaboration between stakeholders? Strengthened permanent monitoring bodies (comprised of individual community members); formalised herder-government-researcher collaboration; created model for multi-stakeholder wetland governance in eastern steppe.	☐	☐	☐	☒
Did the Approach encourage young people/ the next generation of land users to engage in SLM? Youth pride in "bringing the crane back" creates strong generational link to conservation.	☐	☐	☐	☒
Did the Approach lead to improved access to water and sanitation? Restored wetland/spring hydrology improves livestock drinking water availability and quality; no direct human sanitation link.	☐	☐	☒	☐
Did the Approach improve the capacity of the land users to adapt to climate changes/ extremes and mitigate climate related disasters? Better water points increase drought resilience for livestock; biodiversity recovery supports ecosystem stability.	☐	☐	☒	☐

Main motivation of land users to implement SLM

- increased production
- increased profit(ability), improved cost-benefit-ratio
- ✓ reduced land degradation
- ✓ reduced risk of disasters
- reduced workload
- payments/ subsidies
- rules and regulations (fines)/ enforcement
- ✓ prestige, social pressure/ social cohesion
- ✓ affiliation to movement/ project/ group/ networks
- ✓ environmental consciousness
- ✓ customs and beliefs, morals
- ✓ enhanced SLM knowledge and skills
- ✓ aesthetic improvement
- conflict mitigation

Sustainability of Approach activities

Can the land users sustain what has been implemented through the Approach (without external support)?

- no
- ✓ yes
- uncertain

Herders voluntarily built/maintain the fence (monthly inspections, post-storm repairs) and eco-clubs continue bird monitoring. Soum government and Onon-Ulz Basin Administration to incorporate maintenance into annual environmental budget. Public awareness campaigns reinforce commitment.

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- Herders express strong pride: "We brought the crane back – it feels like our own protected home." The visible success (pair breeding since 2020 at Khulst/Ulz) creates social prestige, reinforces traditional respect for wildlife, and strengthens community identity as stewards of nature.
- Fencing prevents trampling, leading to vegetation recovery (2–3× increase at Khulst) and restored wetland/spring hydrology.
- Eco-club students actively monitor birds, conduct awareness activities, and learn SLM. Herders appreciate children caring about nature, fostering long-term environmental consciousness in the community.

Strengths: compiler's or other key resource person's view

- Seamless coordination (soum government, basin admin, WWF, researchers, herders, schools) with participatory planning mitigates conflicts. Proven at multiple sites (Khulst, Khuuvur, Ulz); scalable to other eastern steppe wetlands facing overgrazing, aligning with national biodiversity/LDN policies
- Eco-clubs provide ongoing monitoring, education, and generational continuity. Public campaigns raise broader awareness of wetland importance, contributing to Mongolia's crane conservation commitments and potential eco-tourism.
- Crane pair returned and bred within one season. Demonstrates effective low-intervention SLM for critically endangered species habitat.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- Initial extra workload for fence construction and occasional repairs — Schedule major activities outside peak livestock periods (e.g., late autumn or early spring); share tasks among more households through community rotation systems
- Uncertainty about long-term fence durability in harsh climate — Conduct joint herder-government annual pre-winter inspections; integrate basic repair materials into soum emergency budget.
- No immediate cash income from the activity — Develop simple community-based eco-tourism guidelines (bird-watching points outside fence); link with national/international crane conservation networks for visitor promotion.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- Dependence on external project funding for initial establishment — Formalize integration of fence maintenance and monitoring into annual soum environmental budget; document cost-benefit evidence to justify recurring budget line; seek co-funding from national biodiversity programmes or international donors for scaling.
- Risk of reduced motivation/coordination after project handover and staff rotation — establish annual joint review meeting (soum, basin, community representatives); train eco-club teachers as permanent facilitators.
- Limited quantitative socio-economic impact — Conduct targeted follow-up socio-economic survey (preferably with sex-disaggregated questions); include simple indicators in eco-club monitoring (e.g., female participation rate, youth involvement hours); share results.

REFERENCES

Compiler

Tserendulam Tseren-Ochir

Editors

Mandakh Nyamtseren
Rima Mekdaschi Studer
Sodnomdarjaa Enkhjargal

Reviewers

Jonas Chastonay
William Critchley

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Resource persons

Tserendulam Tseren-Ochir - co-compiler
Sodnomdarjaa Enkhjargal - Project specialist

Mandakh Nyamtseren - Editor
Ууганбаяр Мункхбат - Биологийн олон
янг байдлын хамгааллын мэргэжилтэн

Linked SLM data

Technologies: Buryat sheepfold-style fencing enclosures | <https://wocat.net/en/database/technologies/7446/>

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Full description in the WOCAT database

<https://wocat.net/en/database/approaches/7445/>

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General overview of field where conservation agriculture is implemented (Mandakh N.)

Conservation agriculture to restore abandoned cropland (Mongolia)

Khurs Khamgaallin gazar tarialan

DESCRIPTION

This technology aimed to restore abandoned cropland which was used for crop and fodder production during the 1970s-1980s. Since 2016, the farmer applied conservation agriculture and mixed cropping to reduce land degradation, revive cropping practices, increase land productivity for agriculture and enhance soil health.

The land in Kherlen soum, Khentii province, spanning 500 hectares, was used for crop production and later for producing fodder for livestock. However, since 1984, it has been left abandoned. To rehabilitate the area and revive cropland, conservation agriculture combined with mixed cropping was introduced in 2014.

Mixed cropping encompasses various agrotechnical practices that involve the cultivation of different crops together, making use of their ability to interact with each other. The aim is to sustain crop yield in regions with limited moisture, protect the soil surface, regulate soil moisture levels, and enhance the availability of micro and macro-nutrients. In Kherlen soum, Khentii province, mixed cropping was implemented by planting seed mixtures of different proportions, taking into consideration the specific requirements and differences among various crops. Presently, annual crops such as mustard, peas, Cape rice, and wheat, rye along with rapeseeds, are successfully cultivated mixed and/or in rotation in the area.

Conservation agriculture in soil protection agriculture offers several advantages, including the enhancement of soil, its resilience to external factors such as erosion by wind, regulation of soil fertility and microorganism populations, avoidance of highly toxic substances in agriculture, and increased productivity. One significant aspect of conservation agriculture is using no-till and direct sowing techniques to minimize soil disturbance. During harvesting, only the crop heads are collected, while the remaining rootsystems and stems are left in and above the soil contributing to increasing soil organic matter. Other residues and parts of plants, such as straw/ stalks and leaves, are shredded and spread across the field to reduce soil moisture evaporation and protect it from the sun and wind. Soil erosion by wind can be mitigated by covering the soil as much and long as possible either by leaving the crop residues on the soil and/or including cover crops into crop rotations. Furthermore, this technology improves the soil health and microenvironment/ microclimate.

To initiate and implement this technology, the land user leased most of his land through a proposal, aimed at improving the soil quality of abandoned land, to the local government, and also purchased a certain amount of land through a land auction announced on the government website. Initial preparation of land for sowing consisted of removing stones from the field and spraying herbicides to get rid of weeds and their seeds. A minimal dose of herbicides with low toxicity is used to control the growth and spread of weed plants commonly found in abandoned fields. Later on mustard was incorporated into mixed cropping and rotations suppressing the growth of weed. In the first year, the farmer planted a mixture of mustard, oilseed rape and lucerne to enhance soil penetration and break up compacted soil, as well as wheat in a 40 cm strip

LOCATION



Location: Kherlen soum, Takhilgat bag, Khentii province, Mongolia

No. of Technology sites analysed:
single site

Geo-reference of selected sites:
• 110.993101, 47.569039

Spread of the Technology: evenly spread over an area (8 km²)

In a permanently protected area?: No

Date of implementation: 2014 ; less than 10 years ago (recently)

Type of introduction

- ☒ through land users' innovation
- ☐ as part of a traditional system (> 50 years)
- ☒ during experiments/ research
- ☐ through projects/ external interventions

on stony soil with low fertility. First few years (2014-2018), the farmer didn't harvest all the yields to keep the soil covered and improve the soil quality.

In 2019 the farmer built a fence to protect against grazing and yields significantly improved. Moreover, various equipment such as direct seeder for no till or minimum tillage crop cultivation, combine harvester, tractor, herbicide spraying machine and seed sorting machines to improve the quality of produce for the market (clean and separate seeds of different sizes and different types of crops) were bought with a bank loan.

A comprehensive knowledge of the interactions and symbiotic relationships between different crops is also essential to plan for crop mixtures and rotations. Crop morphology such as root system, competition for nutrients and water should be considered. Mustard-pea mixture facilitates harvesting as pea is difficult to harvest in monoculture and mustard can provide biological weed control.

He divided the land / field into 12 plots, which were planted with different crop mixtures and in rotation, maintaining soil fertility, limiting pests and diseases, and increasing crop yields. Legumes can improve soil fertility by adding nitrogen to the soil. The farmer practiced five-field rotation in his cropland using legumes including pea, bean, lentils and alfalfa. The rotation plan depends on climate conditions.

The levels of potassium and phosphorous in the soil were monitored and regularly measured. Only when a deficit occurred the land user used mineral fertilizers.

According to farmers who practice conservation agriculture and mixed farming, these technologies effectively maintain soil stability, ensuring its long-term sustainability.



After sowing and before cover crops emerged, 29th, May, 2018 (Batnaran B.)



Soil quality and land productivity improved after cover crop development (Batnaran B.)

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- ✓ improve production
- ✓ prevent, reduce land degradation; restore/rehabilitate land
- conserve ecosystem
- protect a watershed/ downstream areas – in combination with other Technologies
- ✓ preserve/ improve biodiversity
- reduce risk of disasters
- ✓ adapt to climate change/ extremes and its impacts
- mitigate climate change and its impacts
- ✓ create beneficial economic impact
- create beneficial social impact

Purpose related to land degradation

- prevent land degradation
- reduce land degradation
- ✓ restore/ rehabilitate severely degraded land
- adapt to land degradation
- not applicable

Land use

Land use mixed within the same land unit: No



Cropland

- Annual cropping : cereals - barley, cereals - oats, cereals - wheat (spring), fibre crops - flax, hemp, other, fodder crops - alfalfa, legumes and pulses - lentils, legumes and pulses - peas, oilseed crops - sunflower, rapeseed, other, seed crops - sesame, poppy, mustard, other
- Cropping system: Wheat or similar rotation with hay/pasture
- Number of growing seasons per year: 1
- Is intercropping practiced? No
- Is crop rotation practiced? Yes

Water supply

- ✓ rainfed
- mixed rainfed-irrigated
- full irrigation

Degradation addressed



soil erosion by wind Et: loss of topsoil, Eo: offsite degradation effects



chemical soil deterioration Cn: fertility decline and reduced organic matter content (not caused by erosion)



biological degradation Bc: reduction of vegetation cover, Bq: quantity/ biomass decline, Bs: quality and species composition/ diversity decline

SLM group

- rotational systems (crop rotation, fallows, shifting cultivation)
- improved ground/ vegetation cover
- minimal soil disturbance

SLM measures



agronomic measures A1: Vegetation/ soil cover, A2: Organic matter/ soil fertility, A3: Soil surface treatment, A5: Seed management, improved varieties, A6: Residue management

A3: Differentiate tillage systems

A 3.1: No tillage

A6: Specify residue management

A 6.4: retained



management measures M1: Change of land use type

TECHNICAL DRAWING

Technical specifications

This diagram shows how the crop mix was distributed across the field in 2023 (on different plots). Entire field was divided into 5 main sections which are intended for crop rotation and also several small sections which are for ensuring seed source. More than 20 types of crops were planted in the whole field. A five-field rotation is practiced in this cropland with a sequence of cereal grains (wheat, barley, oats, etc.) followed by leafy plants (flax, lentils, peas, mustard, etc.), depending on the climatic conditions of the year. In dry years, the land user prefers to grow cereals and flax, which are more resistant to drought, and then rotate cereals with a mixture of leafy plants the following year. In years with good humidity, on the other hand, a mixture of mustard + peas + oats + lentils is suitable. The advantages of this mixture is to improve soil fertility and to control diseases and pest. In addition, soil remains covered against soil erosion. Inclusion of different crops means also increase in agrobiodiversity.

Overview on total area of Batnaran's cropland:

Crop mixture

- 1 – mixture of mustard + wheat
- 2 – mixture of flax + lentil
- 3 – mixture of mustard 2 + pea
- 4 - mixture of wheat + mustard
- 5 - mixture of mustard 1 + pea
- 6 - mixture of wheat + oat+ mustard
- 7 – wheat
- 8 – staff house



Author: Ankhbayar N., Gereltuya G.

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated: per Technology area (size and area unit: **800 ha**)
- Currency used for cost calculation: **Tugrik**
- Exchange rate (to USD): 1 USD = 3453 Tugrik
- Average wage cost of hired labour per day: 50000 - 100000

Most important factors affecting the costs

Factors that mainly affect the cost are inflation and the MNT exchange rate (mainly relevant when purchasing imported products). In addition, in the event of extreme weather and disastrous conditions, extra labor may be required to mitigate damage.

Establishment activities

1. Build fence (Timing/ frequency: before sowing)
2. Prepare (picking stones) and plough land (Timing/ frequency: before sowing)
3. Buy and spray herbicide (Timing/ frequency: before sowing)
4. Purchase tractor (Timing/ frequency: before sowing)
5. Purchase direct seeder (Timing/ frequency: before sowing)
6. Purchase combine harvester (Timing/ frequency: before sowing)
7. Purchase spray machine (Timing/ frequency: before sowing)
8. Purchase seed cleaning machine (Timing/ frequency: before sowing)
9. Purchase stone picker machine (Timing/ frequency: before sowing)
10. Purchase or rent pile machine for fencing (Timing/ frequency: before sowing)
11. Purchase silos (Timing/ frequency: before harvesting)
12. Storage shed (Timing/ frequency: before harvesting)

Establishment inputs and costs (per 800 ha)

Specify input	Unit	Quantity	Costs per Unit (Tugrik)	Total costs per input (Tugrik)	% of costs borne by land users
Labour					
Build fence	person	2	15 000 000.00	30 000 000.00	100
Spray herbicide	person	2	350 000.00	700 000.00	100
Sowing	person	1	4 000 000.00	4 000 000.00	100

Total costs for establishment of the Technology (Tugrik)

3 073 800 004.00

Total costs for establishment of the Technology in USD

890 182.45

Specify input	Unit	Quantity	Costs per Unit (Tugrik)	Total costs per input (Tugrik)	% of costs borne by land users
Stone picking	хүнperson	1	4 800 000.00	4 800 000.00	100
Equipment					
Tractor	piece	1	220 000 000.00	220 000 000.00	100
Direct seeder	piece	1	224 000 000.00	224 000 000.00	100
Combine harvester	piece	2	397 000 000.00	794 000 000.00	100
Agriculture spray machine	шpiece	1	170 000 000.00	170 000 000.00	100
Stone picker machine	piece	1	15 000 000.00	15 000 000.00	100
Seed cleaning machine	piece	3	35 000 000.00	105 000 000.00	100
Pile machine for fencing	piece	1	6 900 000.00	6 900 000.00	100
Silos	tonnes (holding capacity)	700	714 285.72	500 000 004.00	100
Plant material					
Seeds first year	tonnes	70.5	4 400 000.00	310 200 000.00	100
Fertilizers and biocides					
Herbicide	l	2 400	8 000.00	19 200 000.00	100
Construction material					
Poles and net for fence	км	25	10 800 000.00	270 000 000.00	100
Other					
Land lease	ha	800	500 000.00	400 000 000.00	100

Total costs for establishment of the Technology (Tugrik)

3 073 800 004.00

Total costs for establishment of the Technology in USD

890 182.45

Maintenance activities

1. Sowing/ direct seeding (Timing/ frequency: April to May per year)
2. Harvesting and separating harvested seeds (Timing/ frequency: once in August to September)
3. Reproducing seed for own use and sowing (Timing/ frequency: after harvest)
4. Spray herbicide (Timing/ frequency: if necessary, once in 2-3 year)
5. Monitoring on plant development (e.g. germination, flowering, maturity) (Timing/ frequency: at each plant development stage)
6. Monitoring soil fertility (Timing/ frequency: once a year, in August)

Maintenance inputs and costs (per 800 ha)

Specify input	Unit	Quantity	Costs per Unit (Tugrik)	Total costs per input (Tugrik)	% of costs borne by land users
Labour					
Spray herbicide	person	2	1 400 000.00	2 800 000.00	100
Harvesting	person	4	1 500 000.00	6 000 000.00	100
Separating seeds	person	2	1 000 000.00	2 000 000.00	100
Sowing seeds	person	2	1 500 000.00	3 000 000.00	100
Equipment					
Spraying machine (fuel)	l/year	400	2 400.00	960 000.00	100
Combine harvesting machine (fuel)	l/year	4 000	2 400.00	9 600 000.00	100
Sowing machine (fuel)	l/year	4 000	2 400.00	9 600 000.00	100
Spare parts and maintenance of machines	ha	800	10 500.00	8 400 000.00	100
Plant material					
Seeds	tonne/year	13.7	4 400 000.00	60 280 000.00	100
Fertilizers and biocides					
Herbicide (different types)	l	1	30 000.00	30 000.00	100
Other					
Land use tax	MNT/year	1	1 900 000.00	1 900 000.00	100
Soil sampling and testing	MNT/year	1	830 000.00	830 000.00	100

Total costs for maintenance of the Technology (Tugrik)

105 400 000.00

Total costs for maintenance of the Technology in USD

30 524.18

NATURAL ENVIRONMENT

Average annual rainfall

- ☒ < 250 mm
- ☐ 251 – 500 mm
- ☐ 501 – 750 mm
- ☐ 751 – 1 000 mm
- ☐ 1 001 – 1 500 mm
- ☐ 1 501 – 2 000 mm
- ☐ 2 001 – 3 000 mm
- ☐ 3 001 – 4 000 mm
- ☐ > 4 000 mm

Agro-climatic zone

- ☐ humid
- ☐ sub-humid
- ☒ semi-arid
- ☐ arid

Specifications on climate

Average annual rainfall in mm: 150

Name of the meteorological station: Undurkhaan

This region includes a region with harsh cold winters and dry summers. The average annual air temperature is -0.2 celsius, and the difference between day and night temperature ranges from 13 to 15 degrees.

Slope

- ☐ flat (0-2%)
- ☒ gentle (3-5%)
- ☐ moderate (6-10%)
- ☐ rolling (11-15%)
- ☐ hilly (16-30%)
- ☐ steep (31-60%)
- ☐ very steep (>60%)

Landforms

- ☐ plateau/plains
- ☐ ridges
- ☐ mountain slopes
- ☐ hill slopes
- ☐ footslopes
- ☒ valley floors

Altitude

- ☐ 0 – 100 m a.s.l.
- ☐ 101 – 500 m a.s.l.
- ☐ 501 – 1 000 m a.s.l.
- ☒ 1 001 – 1 500 m a.s.l.
- ☐ 1 501 – 2 000 m a.s.l.
- ☐ 2 001 – 2 500 m a.s.l.
- ☐ 2 501 – 3 000 m a.s.l.
- ☐ 3 001 – 4 000 m a.s.l.
- ☐ > 4 000 m a.s.l.

Technology is applied in

- ☐ convex situations
- ☒ concave situations
- ☐ not relevant

Soil depth

- ☐ very shallow (0-20 cm)
- ☒ shallow (21-50 cm)
- ☐ moderately deep (51-80 cm)
- ☐ deep (81-120 cm)
- ☐ very deep (> 120 cm)

Soil texture (topsoil)

- ☒ coarse/ light (sandy)
- ☐ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Soil texture (> 20 cm below surface)

- ☐ coarse/ light (sandy)
- ☒ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Topsoil organic matter content

- ☐ high (>3%)
- ☐ medium (1-3%)
- ☒ low (<1%)

Groundwater table

- ☐ on surface
- ☐ < 5 m
- ☒ 5 – 50 m
- ☐ > 50 m

Availability of surface water

- ☐ excess
- ☒ good
- ☐ medium
- ☐ poor/ none

Water quality (untreated)

- ☒ good drinking water
 - ☐ poor drinking water (treatment required)
 - ☐ for agricultural use only (irrigation)
 - ☐ unusable
- Water quality refers to: both ground and surface water*

Is salinity a problem?

- ☐ Yes
- ☒ No

Occurrence of flooding

- ☒ Yes
- ☐ No

Species diversity

- ☐ high
- ☒ medium
- ☐ low

Habitat diversity

- ☐ high
- ☐ medium
- ☒ low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation

- ☐ subsistence (self-supply)
- ☒ mixed (subsistence/ commercial)
- ☐ commercial/ market

Off-farm income

- ☒ less than 10% of all income
- ☐ 10-50% of all income
- ☐ > 50% of all income

Relative level of wealth

- ☐ very poor
- ☐ poor
- ☒ average
- ☐ rich
- ☐ very rich

Level of mechanization

- ☐ manual work
- ☐ animal traction
- ☒ mechanized/ motorized

Sedentary or nomadic

- ☒ Sedentary
- ☐ Semi-nomadic
- ☐ Nomadic

Individuals or groups

- ☐ individual/ household
- ☐ groups/ community
- ☐ cooperative
- ☒ employee (company, government)

Gender

- ☐ women
- ☒ men

Age

- ☐ children
- ☐ youth
- ☒ middle-aged
- ☐ elderly

Area used per household

- ☐ < 0.5 ha
- ☐ 0.5 – 1 ha
- ☐ 1 – 2 ha
- ☐ 2 – 5 ha
- ☐ 5 – 15 ha
- ☐ 15 – 50 ha
- ☐ 50 – 100 ha
- ☐ 100 – 500 ha
- ☒ 500 – 1 000 ha
- ☐ 1 000 – 10 000 ha
- ☐ > 10 000 ha

Scale

- ☐ small-scale
- ☒ medium-scale
- ☐ large-scale

Land ownership

- ☒ state
- ☐ company
- ☐ communal/ village group
- ☐ individual, not titled
- ☐ individual, titled

Land use rights

- ☐ open access (unorganized)
- ☐ communal (organized)
- ☒ leased
- ☐ individual

Water use rights

- ☐ open access (unorganized)
- ☐ communal (organized)
- ☐ leased
- ☒ individual

Access to services and infrastructure

health	poor			good
education	poor			good
technical assistance	poor			good
employment (e.g. off-farm)	poor			good
markets	poor			good
energy	poor			good
roads and transport	poor			good
drinking water and sanitation	poor			good
financial services	poor			good

IMPACTS

Socio-economic impacts

crop production	decreased					increased	Quantity before SLM: 0 Quantity after SLM: 25 centner/ha It is important to note that crop production is highly dependent on weather conditions. In 2021, when there was enough precipitation, a yield of 25 centner/ha was achieved. However, in 2014-2016, when technology implementation was just starting in severely degraded land and coincided with drought, there were occasions where all yield was lost.
crop quality	decreased					increased	Specific weight, indicating seed quality, of grain reached 900 g/l and, gluten content of wheat always meets the requirements of first grade of food.
fodder production	decreased					increased	Comparisons between 2018 and 2022 indicate that the average length of the wheat grain head increased and reached 10 - 12 centimeters by 1st July, resulting in a higher yield. Oats and wheat are harvested for fodder production while peas are supplied to chicken farms.
fodder quality	decreased					increased	In terms of wheat quality, it is classified into first grade. The protein content of Bayalag variety of peas is 18-20%, starch content is 26-35%.
risk of production failure	increased					decreased	We concluded that this technology can overcome any risks related to labor and expenses, because sowing time is different for many types of crops, reducing the amount of expenses and labor load.
product diversity	decreased					increased	Quantity before SLM: 1 Quantity after SLM: 20 About 20 species of plants are being cultivated.
expenses on agricultural inputs	increased					reduced	Quantity before SLM: 9 centner Quantity after SLM: 3 centner The amount of seeds used for planting is lower, the seeds can be used for the next year cultivation: The spread of plant diseases / pests and use of pesticides is relatively low. Herbicides and fertilizers are not applied in this technology. Thus, there is no expense on that.
farm income	decreased					increased	Quantity after SLM: 5 centner The yield is dependent on the climatic conditions of the year. In wheat yield, 3 centners were spent on sowing and 5 centners were obtained for each hectare when the weather was not favorable and precipitation was relatively low. Therefore, the net income is 2 centners in this case.
workload	increased					decreased	Quantity before SLM: 4 Quantity after SLM: 2 Sowing time is different for many types of crops, so it does not requires a high number of labor. 2 persons typically work on the entire area throughout the year and, 2 more persons are employed during harvesting.

Socio-cultural impacts

food security/ self-sufficiency	reduced					improved	
SLM/ land degradation knowledge	reduced					improved	Mentorship program for other farmers is organized.

Ecological impacts

water quantity	decreased 	increased
evaporation	increased 	decreased
soil moisture	decreased 	increased
soil cover	reduced 	improved
soil loss	increased 	decreased
nutrient cycling/ recharge	decreased 	increased
soil organic matter/ below ground C	decreased 	increased
vegetation cover	decreased 	increased
biomass/ above ground C	decreased 	increased
plant diversity	decreased 	increased
animal diversity	decreased 	increased
beneficial species	decreased 	increased
pests/ diseases	decreased 	increased
flood impacts	increased 	decreased
drought impacts	increased 	decreased
wind velocity	increased 	decreased

Гүний ус

Due to cover crops and residue left on the soil, it reduces the amount of water evaporation from the soil and keeps the soil moisture .

Cover crops and plant residues left on the soil surface protect against wind erosion, reduces soil water evaporation and improves soil moisture content.

Quantity before SLM: 0 см

Quantity after SLM: 2 см

Технологи хэрэгжүүлэхээс өмнө тус талбайд ургамал сийрэг тархсан, өнгөн хөрс салхиар хүчтэй элэгдэж үржил шимээ алдсан, хайргаар битүү хучигдсан байсан.

Snow cover in winter, has an important effect on protecting the soil from wind erosion in the spring.

It is believed that when the content of organic matter in the soil increases by 1 percent, the water holding capacity of the soil increases by 4 percent. From this point of view, it can be concluded that the content of organic matter has improved.

Before the technology, vegetation cover was sparse and there were only 2-3 species of weeds in a square of 1m x 1m.

Aboveground biomass increased. Prairie sagebrush is predominating in natural vegetation community.

According to the results of soil sampling, the ratio of microorganisms in the soil has increased. It is also clearly observed that the variety of insects and the birds that feed on them have increased due to the rise in plant species.

From 2019, mushrooms started growing in the field. Flaxes, forming symbioses with fungus, are planted in order to enhance distribution of fungus in soil. Fungus has a positive effect on soil quality.

Mustard and peas have been observed to limit the growth of weeds such as hogweed. Additionally, mustard releases two powerful substances that can help limit the spread of diseases.

Quantity before SLM: high

Quantity after SLM: low

Sown stands and plant cover can mitigate heavy flooding, then, the risk of washing away the fertile layer of the soil can be reduced. In addition, the stands will retain plant residues and other objects carried by the flood water. It can also be composted into the soil.

Quantity before SLM: high

Quantity after SLM: low

Because the soil moisture content is good compared to other areas, the yield is higher in drought years and soil erosion is less.

Wind velocity is high in this region. We are thinking about establishing windbreak in the field.

Off-site impacts

wind transported sediments	increased 	reduced
damage on neighbours' fields	increased 	reduced

Improves wind cleanliness by catching organic material and other residues carried by the wind.

The technology can reduce the risk of flooding

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns	very negative				very positive
Long-term returns	very negative				very positive

Benefits compared with maintenance costs

Short-term returns	very negative				very positive
Long-term returns	very negative				very positive

Establishment cost for 800 hectare of agricultural farm was approximately 3.6 billion MNT and there is no income in first several years. In long term, annual cost have decreased and, annual income became 320 million MNT, net income 128 million MNT. Thus, income can be positive in long term.

CLIMATE CHANGE

Gradual climate change

annual temperature increase	not well at all				very well	
seasonal temperature increase	not well at all				very well	Season: summer
seasonal temperature decrease	not well at all				very well	Season: winter
seasonal rainfall decrease	not well at all				very well	Season: summer
seasonal rainfall decrease	not well at all				very well	Season: spring

Climate-related extremes (disasters)

local snowstorm	not well at all				very well
local sandstorm/ duststorm	not well at all				very well
heatwave	not well at all				very well
drought	not well at all				very well
epidemic diseases	not well at all				very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1 – 10 %
- 11 – 50 %
- > 50 %

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- 0 – 10 %
- 11 – 50 %
- 51 – 90 %
- 91 – 100 %

Number of households and/ or area covered

1 household

Has the Technology been modified recently to adapt to changing conditions?

- Yes
- No

Crop rotation decisions are made based on spring weather conditions and soil moisture of the planting year. In some years, the crop rotation and mixture is not changed.

To which changing conditions?

- climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- The technology provides higher yields than traditional monoculture in climate condition in Mongolia.
- The technology allows to plant crops early in spring, because soil moisture absorbed from winter snow provide convenient condition.
- Soil erosion and sand accumulation have been significantly reduced.
- Conservation agriculture can significantly improve the physical properties of soil, providing sustainable and ecological rehabilitation of abandoned land.
- Conservation agriculture can significantly improve the physical properties of soil, providing sustainable and ecological rehabilitation of abandoned land.

Strengths: compiler's or other key resource person's view

- Abandoned land can be restored at the lowest cost.
- Soil conservation technology was used without reducing the soil fertility as well as returning of abandoned land into use.
- The use of machinery in medium-scale farming is advantageous because it reduces labor costs.
- Planting with low seed rates increases the economic efficiency in the long term.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- Due to climate change and aridity, in some years, crop loss occurs during the planting and growing period. — Install irrigation system for seasonal irrigation or irrigation when needed.
- When harvesting, it is necessary to leave a plant cover as high as possible, which requires particular harvesting machine. — A combine harvester or a machine (head stripper) that collects only heads of the crop is required.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- The use of imported seeds increases the cost. — To cultivate crop seeds in small isolated areas.
- With climate change, the lack of irrigation facilities increases risk of production failure. — More water harvesting techniques and soil moisture conservation/accumulation technologies to be identified and implemented. Installation of an irrigation system for supplementary irrigation or irrigation when needed.
- It is difficult to separate the seeds after harvesting due to the lack of techniques and appropriate equipment. Sorted seeds will increase market value. — Improve seed sorting mechanism.
- Due to the lack of appropriate harvesting equipment, the crop cannot be harvested completely. — Buy a new type of combine harvester or rent from others.

REFERENCES

Compiler

Otgontsetseg Davaanyam

Editors

Mandakh Nyamtseren

Reviewers

Joana Eichenberger
Rima Mekdaschi Studer

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Resource persons

Batnaran Batdeleg - land user

Full description in the WOCAT database

<https://wocat.net/en/database/technologies/6933/>

Linked SLM data

Approaches: Mentorship programme on conservation agriculture <https://wocat.net/en/database/approaches/6995/>

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Project

- Global coordination project for the SFM Dryland Sustainable Landscapes Impact Program (GEF-FAO / DSL-IP)

Key references

- Guidelines for Intercropping. Charles L. Mohler, Sue Ellen Johnson. 2009. ISBN 978-1-933395-21-0 — <https://www.sare.org/wp-content/uploads/Crop-Rotation-on-Organic-Farms.pdf>
- Encyclopedia of Biodiversity, Reference Work. Second Edition. 2013. ISBN 978-0123847195 — <https://www.amazon.com/Encyclopedia-Biodiversity-2nd-Set/dp/0123847192>

Links to relevant information which is available online

- Intercropping: benefits and types — <https://geopard.tech/blog/what-is-intercropping-and-how-does-it-work/>
- Intercropping: Ergonomic And Efficient Farming — <https://eos.com/blog/intercropping/>
- INTERCROPPING — <http://hwrp.eu/measure/intercropping>

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Meeting of farmers, agricultural producers and agricultural policy makers in the framework of the mentorship programme (Mongolian National Crop Farmers Association)

Mentorship programme on conservation agriculture (Mongolia)

Zaluu tarialanchiin mentor khutulbur

DESCRIPTION

The Approach aims to ensure the sustainability of the agricultural sector by training and mentoring young farmers in conservation agriculture to improve soil fertility and health and maintain productivity.

Within the framework of the mentorship programme, companies introducing innovative technologies in the agricultural discipline such as conservation agriculture, are selected as mentors and connected with young entrepreneurs who are new to this type of activities. Based on main principles of mentorship, the conservation agriculture training and mentorship program aims to transfer knowledge and skills gained from real-life experiences, lessons learnt, failures, and success stories from the experienced farmers to young farmers.

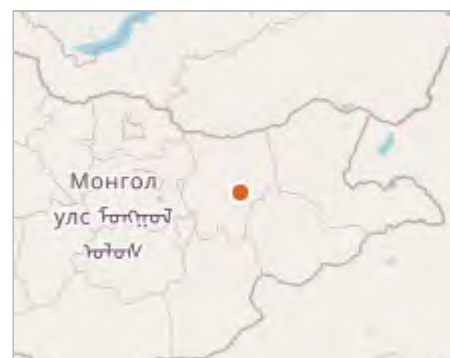
The mentors develop a technology card, showing main steps how to apply the technology to the young farmers. Farmers further share their experiences and knowledge gained during technology adoption through group chats and group pages on the social media, giving advice on how to fix any problems and uploading their stories on how they overcame problems in the same situation. The mentorship program involves workshops combined with in-person training to provide fundamental understanding of the SLM technology and practical field visits.

In order to empower young farmers, the Mongolian National Crop Farmers Association organized an introductory training course on mixed cropping technology and conservation agriculture (CA) in 2022. As a result of the training, young farmers who were interested in this technology became members of the mentorship program with the condition that they modify their equipment, machinery and field specifications/requirements (e.g. fencing and leaving cover on the soil surface) to adapt to CA. Total of 9 companies from nearby provinces, Dornod and Khentii, participated in the program as mentees. The mentorship program on Mixed Cropping and CA is led by Khentiin Tarialan LLC which is successfully implementing these technologies in Khentii province.

In order to sustainably maintain the mentorship program, the Mongolian National Crop Farmers Association and the project "Promoting Dryland Sustainable Landscapes and Biodiversity Conservation in the Eastern Steppe of Mongolia" implemented by FAO and WWF organize workshops for young farmers in the non-agricultural season (winter) and conduct field visits before the agricultural season (spring) every year, helping to spread good practice and knowledge.

In 2023, the mentor gave methodological advice to young farmers during a classroom lecture on how to maintain plant health, develop mixed cropping and crop rotation maps, take soil samples with specific equipment, and how to check crop quality followed by a field visit during which participants obtained knowledge about positive impacts of mixed cropping and CA on soil restoration and financial benefits as well as at first year results, lessons learnt (success and failures) and problems encountered. A total of 129 farmers from Dornod, Khentii, Sukhbaatar, Darkhan, Bulgan, Tuv and Selenge provinces participated in this training.

LOCATION



Location: Takhilgat bag, Khentii province, Kherlen soum, Mongolia

Geo-reference of selected sites:

• 110.992279, 47.571772

Initiation date: 2022

Type of Approach

- ☐ traditional/ indigenous
- ☒ recent local initiative/ innovative
- ☐ project/ programme based

In addition, a closed group has been set up to share information using social networking sites, and a mentor uploads short videos on the internet to introduce the technology to people who are interested. In the future, it is planned to increase the number of mentors and topics.

Because this program is organized on a need-based and volunteer basis, parties participate with a positive attitude. Basic requirements including financial support, communication and cooperation are needed to support and sustain the implementation of the program.



Young farmers involved in mentorship program field visit to discuss the importance of conservation agriculture and its positive effects on the environment and economy. (Oyungerel Ts.)



Regular meetings are organized to enhance the knowledge on soil and biodiversity conservation, and attendees discussed about further activities of the mentorship program during this session. (The Mongolian National Crop Farmers Association)

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims/ objectives of the Approach

The primary objective is to establish a knowledge-sharing and training network for farmers, enabling them to exchange their observations, achievements, and challenges gathered from actual experiences, and to introduce modern agricultural technologies that are resilient to climate change and have a positive impact on soil and biodiversity.

Conditions enabling the implementation of the Technology/ ies applied under the Approach

- **Institutional Setting:** The Ministry of Food, Agriculture and Light Industry and local administration, UNDP-FAO, General department of Land Planning, Geodesy and Mapping support the mentorship program.
- **Collaboration/ Coordination Of Actors:** As a result of the collaboration among the UNDP-FAO, WWF and Khentiin Tarialan LLC, other farmers can share their experiences and knowledge.
- **Policies:** The agricultural policy at national and local level may support multi-species agriculture with high-productivity, because of their positive effects on soil protection and sustainable use. The local administrative support entities aimed to rehabilitate degraded land by renting land and providing soft loan.
- **Land Governance (Decision-Making, Implementation And Enforcement):** It is a form of support to include it in local land management planning.
- **Knowledge About SLM, Access To Technical Support:** Volunteer members of the mentoring program facilitate knowledge sharing and give technical support.
- **Workload, Availability Of Manpower:** The implementing conservation agricultural technologies has the potential to reduce labour costs related to pest control, herbicide and fertilizer application

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Availability/ Access To Financial Resources And Services:** Not every farmer has the opportunity to upgrade his/her machinery and take advantage of bank subsidy programs. For circulation and investment purposes banks lend to food and agricultural enterprises low loans with interest rates from about 5 to 8 per cent and 5-15 billion tugruks for 2-7 years (2023).
- **Markets (To Purchase Inputs, Sell Products) And Prices:** Main factor affecting costs is inflation. Thus, it can have a great effect on purchasing equipment, seeds and other input. Currently, there is no demand of some of the crops on the market (e.g. flax).

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local land users/ local communities	Local agricultural companies and young farmers. Currently, a total of 9 agricultural companies from Dornod and Khentii provinces are participating in this program.	Exchange and enhance knowledge, connect problems and find solutions together. They are responsible for monitoring soil quality change in their field.
SLM specialists/ agricultural advisers	Batnaran B., Mongolian, farmer. He implements mixed cropping and Conservation Agriculture in Kherlen soum, Khentii province. Currently, he is the only mentor, sharing his knowledge and training other participants. More mentors are planned to become involved.	Develop technical cards, present technological solutions, give advice and information on social networks, host Facebook group and Youtube channel.
NGO	Mongolian National Crop Farmers Association	Organize training courses and meetings, distribute information and offer networking space for participants and farmers.

What stakeholders / implementing bodies were involved in the Approach?	Specify stakeholders	Describe roles of stakeholders
local government	The Department of Food and Agriculture in Khentii province	Provide policy support related to land tenure and provide loan for farmers, disseminate information about mentorship program, carry out external monitoring on yield, and methodological recommendations for farmers.
international organization	UNDP-FAO, WWF	International organizations provide financial support to organize meeting and practical training. These activities help to improve communication between farmers, broaden participant range, disseminate information on technology. Also, they provided variety of seeds that were not commonly planted in Mongolia - so that farmers can create their own seed bank.

Lead agency

Under the goal of revitalizing the agricultural sector of the province, the Department of Food and Agriculture in Khentii province demonstrate leadership on policy level and policy implementation.

Involvement of local land users/ local communities in the different phases of the Approach

	none	passive	external support	interactive	self-mobilization	
initiation/ motivation					✓	As a result of the first regional meeting, the farmers were motivated to introduce new technologies and joined the initiative to develop their farms properly under the guidance and support of the mentor.
planning	✓					The training course and meetings are mainly organized by the Mongolian National Crop Farmers Association, International Organizations and the Department of Food and Agriculture of Khentii province.
implementation					✓	Farmers began the process of upgrading or adapting their machinery according to the mentor's recommendations and started to plant according to the technological card prepared by the mentor.
monitoring/ evaluation		✓				As the initiative is still in its beginning phase, local communities have not been directly involved in monitoring and evaluation of the Approach. But farmers implementing the conservation agricultural technology evaluate changes in soil quality and biodiversity through observation and soil sample analysis. In addition, agricultural specialists of local government evaluate the process of mentorship program based on report.
learn/research				✓		Land users have gained knowledge and experience through the use of printed and electronic resources and applying in their field.

Flow chart

Implementation phases of knowledge sharing network and mentorship program in conservation agriculture.

Author

Otgontsetseg D.



Decision-making on the selection of SLM Technology

Decisions were taken by

- land users alone (self-initiative)
- ✓ mainly land users, supported by SLM specialists
- all relevant actors, as part of a participatory approach
- mainly SLM specialists, following consultation with land users
- SLM specialists alone
- politicians/ leaders

Decisions were made based on

- evaluation of well-documented SLM knowledge (evidence-based decision-making)
- ✓ research findings
- ✓ personal experience and opinions (undocumented)

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ☒ Capacity building/ training
- ☒ Advisory service
- ☐ Institution strengthening (organizational development)
- ☒ Monitoring and evaluation
- ☒ Research

Capacity building/ training

Training was provided to the following stakeholders

- ☒ land users
- ☐ field staff/ advisers

Form of training

- ☒ on-the-job
- ☒ farmer-to-farmer
- ☒ demonstration areas
- ☒ public meetings
- ☐ courses

Subjects covered

Under the topic of conservation agriculture and its special technologies to implement, methods such as crop rotation, intercropping, mixed cropping, and leaving plant stubbles and residues in/on the soil, how they are implemented, their advantages and disadvantages were introduced.

Advisory service

Advisory service was provided

- ☒ on land users' fields
- ☐ at permanent centres
- ☒ other Social network

Land users can take methodological advice from a mentor as well as specialists from local government. Within a limited group and based on social networks, there was an opportunity to receive advice on relevant issues from time to time.

Institution strengthening

Institutions have been strengthened / established

- ☒ no
- ☐ yes, a little
- ☐ yes, moderately
- ☐ yes, greatly

at the following level

- ☐ local
- ☐ regional
- ☐ national

Type of support

- ☐ financial
- ☐ capacity building/ training
- ☐ equipment

Monitoring and evaluation

The farmers implementing the technology monitor changes in soil quality through observation and soil sample analysis. Soil samples collected from field are analyzed in an accepted laboratory. Local government institution does external monitoring on the Approach.

Research

Research treated the following topics

- ☐ sociology
- ☐ economics / marketing
- ☐ ecology
- ☒ technology

To implement the technology, the farmer reviewed literature from many national and international sources. In addition, he had contact with scientists, who helped in deciding what and how to implement.

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- ☐ < 2 000
 - ☒ 2 000 – 10 000
 - ☐ 10 000 – 100 000
 - ☐ 100 000 – 1 000 000
 - ☐ > 1 000 000
- Precise annual budget: 4 430

Total annual budget of technology is approximately MNT 165.5 million or \$ 48 000. This includes labor, implementation of the technology, fuel, purchase of seeds, etc. as well as organization of training courses, field visits, networking and backstopping, monitoring costs and all other expenses.

The following services or incentives have been provided to land users

- ☐ Financial/material support provided to land users
- ☒ Subsidies for specific inputs (including labour)
- ☒ Credit
- ☒ Other incentives or instruments

Subsidies for specific inputs

equipment : machinery

Монгол улсын засгийн газар арилжааны 10 банктэй гэрээ байгуулсан. Арилжааны банк хөнгөлөлттэй зээл 5-6 хувийн хүүтэй хөнгөлөлттэй зээлийг олгох бол Хүнс, хөдөө аж ахуйн яам хүүгийн зөрүү болох 13 хувийг төлөх юм.

partly financed
fully financed



Labour by land users was

- ☒ voluntary
- ☐ food-for-work
- ☐ paid in cash
- ☐ rewarded with other material support

Credit

Conditions: The Mongolian government has decided to provide an investment loan with purpose of supporting the food and agricultural industry in 2023. The credit grants 3-5 year loans with an interest rate of 5-6 percent to farmers in order to improve circulating capital and investment. The credit volume ranges from 5 to 15 billion MNT, depending on the bank and the size of the farm.

Credit providers: The Mongolian government has signed an agreement with 10 commercial banks in Mongolia. The banks are offering soft loans with an interest rate of 5-6 percent, while the Ministry of Food and Agriculture is covering the gap between interest rates, charging 13 percent.

Credit receivers: It can be an individual land user or farmer, a group such as user groups or associations and/ or a cooperative.

Other incentives or instruments

Participants were eligible for subsidized loan from the Agricultural Development Fund which has ended in 2023. The Agricultural Corporation was established in 2021 by the Mongolian government. The Agricultural Corporation is a state-owned limited liability company that provides necessary products for the agricultural development of Mongolia with discounted prices and loans to farmers, allowing to repay the loans with the products produced by them. The corporation is mainly responsible for purchasing all kinds of seeds, fertilizers, plant protection substances, fuel, machinery and equipment from the domestic and international market. The farmers have the possibility to purchase equipment with discount price.

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

Did the Approach empower local land users, improve stakeholder participation?

The mentorship program enabled participants to gain knowledge and experience in conservation agriculture and land restoration by organizing trainings, field visits, meetings and discussions, a fundamental basis for the successful implementation of the technology. Moreover, it supports communication and collaboration among the different stakeholders such as local administration, international organization, companies and local land users.

No
Yes, little
Yes, moderately
Yes, greatly

☐ ☐ ☒ ☐

Did the Approach enable evidence-based decision-making?

Because first-hand experience of conservation agriculture in the field is shared through the mentorship programme, farmers make their decision to adopt conservation agriculture based on the knowledge they have gained from training, the technical and financial support they can receive.

☐ ☐ ☒ ☐

Did the Approach help land users to implement and maintain SLM Technologies?

The mentorship program allows for the dissemination of knowledge about conservation agriculture, including both the establishment and the long-term maintenance of such practices. Furthermore, the farmers participating in the mentorship programme can seek advice through a social network and direct contact with a mentor. By sharing knowledge about conservation agriculture with other farmers, advantages, disadvantages and potential of the technology are shown, as well as the long-term efficiency and benefits for land restoration.

☐ ☐ ☒ ☐

Did the Approach improve coordination and cost-effective implementation of SLM?

Conservation agriculture is a Apin the long term.

☐ ☒ ☐ ☐

Did the Approach improve knowledge and capacities of land users to implement SLM?

A main goal is to improve and share knowledge about Conservation Agriculture. A mentor shares his knowledge with other land users, helping them to build and enhance their experience and knowledge.

☐ ☐ ☐ ☒

Did the Approach improve knowledge and capacities of other stakeholders?

The meeting, organized in 2023, involved all stakeholders and presented the results of the mentorship program as well as of Conservation Agricultural and its related technologies.

☐ ☒ ☐ ☐

Did the Approach build/ strengthen institutions, collaboration between stakeholders?

The Approach improved collaboration between stakeholders by organizing joint meetings and discussions. Generally, Mongolian National Crop Farmers Association and WWF -Mongolia jointly organize the training and meetings. Local government, farmers, international and non-governmental organizations discuss their results and problems to each other during the meeting. It allows to support further collaboration.

☐ ☒ ☐ ☐

Did the Approach encourage young people/ the next generation of land users to engage in SLM?

The mentorship program aims to involve mainly young farmers.

☐ ☐ ☒ ☐

Did the Approach improve the capacity of the land users to adapt to climate changes/ extremes and mitigate climate related disasters?

The Approach enhanced capacity of young farmers through training them on Conservation Agriculture, which improves resilient to climate change and disasters.

☐ ☐ ☒ ☐

Main motivation of land users to implement SLM

- ✓ increased production
- ✓ increased profit(ability), improved cost-benefit-ratio
- ✓ reduced land degradation
- ✓ reduced risk of disasters
- ✓ reduced workload
- payments/ subsidies
- rules and regulations (fines)/ enforcement
- prestige, social pressure/ social cohesion
- affiliation to movement/ project/ group/ networks
- ✓ environmental consciousness
- customs and beliefs, morals
- ✓ enhanced SLM knowledge and skills
- aesthetic improvement
- conflict mitigation

Sustainability of Approach activities

Can the land users sustain what has been implemented through the Approach (without external support)?

- no
- ✓ yes
- uncertain

Previously, a mentor provided advice and knowledge to other farmers through a social network and direct contact. Financial support from international organizations has enabled more farmers to participate in the mentorship program. Further, the local government can organize training, and also the mentor can personally run this program through the social network and extension center. The number of people who are interested in mentorship program is gradually increasing.

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- The mentorship programme supports farmers in implementing Conservation Agriculture by training them in fundamental knowledge, particularly it involves young farmers who are the future land users.
- Young farmers can quickly learn about Conservation Agricultural saving time and can get instructions and advice directly from a mentor with real experiences.
- It is possible to disseminate knowledge to more people on a small budget.
- Communication between farmers and collaboration between organizations can be improved by the Approach. During the meetings and field visits, problems and successes are discussed and experiences shared.

Strengths: compiler's or other key resource person's view

- It is a fast way to practice young farmers in implementing conservation agriculture.
- The social network allows participants to quickly share knowledge and experiences with each other and easily communicate with a mentor.
- Understanding CA from people who have implemented CA. Farmers are motivated to implement conservation agriculture because of its sustainability.
- It provides the opportunity to solve problems as a team, collecting different experiences and solutions.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- In order to organize training in wide range, it needs financial support. — Financial support from other sources, including international organizations and projects.
- Implementing CA requires farmers to adapt their equipment to the technology, which has a high initial cost. — There are soft loans from banks to support sustainable land use. The farmers can get this kind of loan.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- The training course and the field visit require a certain amount of money. Thus, the mentorship program may slow down without financial support. — It needs to get financial support or participants can give payment for the programme.
- It requires coordination to plan trainings and field visits, and means of communication to reach farmers. — To work consistently with local government and farmers.
- Currently, there is only one mentor training farmers. Therefore, the number of mentors with different experiences needs to be increased. — To detect new mentors with experience of conservation agriculture.

REFERENCES

Compiler

Otgontsetseg Davaanyam

Editors

Mandakh Nyamtseren

Reviewers

Rima Mekdaschi Studer

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Resource persons

Oyungerel Tsend - organizer
Javzansuren Norvanchig - organizer
Batnaran Batdeleg - land user

Full description in the WOCAT database

<https://wocat.net/en/database/approaches/6995/>

Linked SLM data

Technologies: Conservation agriculture to restore abandoned cropland <https://wocat.net/en/database/technologies/6933/>

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Institution

- Mongolian Academy of Sciences, Institute of Geography and Geocology (IGG) - Mongolia

Project

- Global coordination project for the SFM Dryland Sustainable Landscapes Impact Program (GEF-FAO / DSL-IP)

Links to relevant information which is available online

- Youtube channel hosted by mentor — <https://www.youtube.com/@covercropmongolia9564>
- Facebook page sharing experiences on social network — <https://www.facebook.com/profile.php?id=100063508026054>

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Students planting cherry seedlings and mulching them with sawdust. (B. Byambadelger, teacher)

Producing wild cherry seedlings in a schoolyard nursery (Mongolia)

Сургуулийн хашааны ил талбайд монос үржүүлэх

DESCRIPTION

Wild cherry seeds are collected and sown in an open-air nursery within a schoolyard. The planting area is fenced by wooden boards and filled with a humus-rich soil and a light mulch, such as sawdust, is added to retain moisture and control weeds. This practice enhances the survival rate of seedlings – which are planted out in school groves as well as being available for greening projects.

The eco-club of a secondary school in Dadal soum, Khentii aimag, has established an open-air nursery in the schoolyard to raise wild cherry (*Padus asiatica*) seedlings. The aim of this technology is: (1) to produce seedlings of resilient local trees suited to the environment; (2) to prepare and provide planting materials for schoolyard groves and local greening projects; (3) to offer hands-on ecological education based on the idea of "learning by doing" and (4) to foster leadership abilities in children and youth.

This area experiences a harsh continental climate with cold winters, a brief growing season, strong winds, and occasional summer droughts, making shortage of livestock forage and moisture scarcity for trees and crops the main challenges.

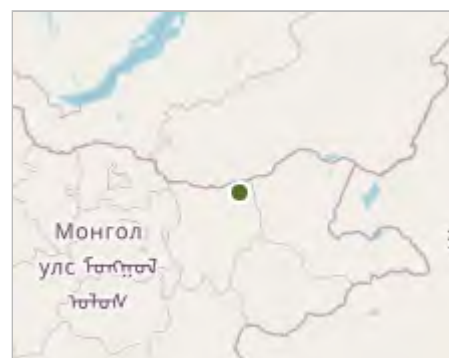
The nursery is situated near the school building, slightly sheltered from the wind, and close to a water source. A fenced, raised seedbed was constructed using a wooden frame. A fertile soil mix was prepared, the seeds (locally collected) then planted, covered with a light layer of soil and mulched with sawdust. Students take turns watering, weeding, and monitoring the soil. This continues throughout the summer holidays. When ready for transplanting, seedlings are used around the school and for community projects – though some are given to local families.

The technology involves a fenced nursery area; raised beds made from local wood, about 1 metre wide; a well-drained soil medium; furrows that are 2–4 cm deep and spaced 10–15 cm apart; a thin layer of sawdust to retain moisture and control weeds; simple labels for seedlings/ transplanted trees, and a record book for monitoring.

Primary tasks include construction and upkeep. This begins with selecting and leveling the site; building wooden frames and fences (using wood, stakes, and hand tools); utilizing fertile soil; cleaning and sorting seeds to enhance germination; mulching with sawdust after planting; irrigation and weeding; maintaining fences and protection; measuring growth, observing, and keeping records. To ensure consistent summer irrigation, a shift schedule is prepared and the health and condition of the seedlings regularly monitored.

The effectiveness and impact of this technology stem from using local seeds and materials, resulting in affordable seedling production. There is an improvement in post-transplant survival due to acclimatization to the open environment; a tangible increase in green spaces in schoolyards, which boosts community engagement and enthusiasm. Furthermore, skills such as seed management, monitoring, teamwork, and responsibility have been developed. Local communities appreciate the outcomes, low costs, and significant educational benefits. However, challenges include irrigation and weeding being labour-intensive in dry and windy conditions, reliance on a stable water source, and the need for continual vigilance and maintenance.

LOCATION



Location: Dadal soum School yard, Khentii aimag, Mongolia

No. of Technology sites analysed:
single site

Geo-reference of selected sites:

• 111.613588, 49.020275

Spread of the Technology: applied at specific points/ concentrated on a small area

In a permanently protected area?: No

Date of implementation: 2019 ; less than 10 years ago (recently)

Type of introduction

- ☒ through land users' innovation
- ☐ as part of a traditional system (> 50 years)
- ☐ during experiments/ research
- ☐ through projects/ external interventions



Setting up the fence to surround the soil for planting in the open field. (B. Byambadelger)



Seeding process (B. Byambadelger)

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- ☐ improve production
- ☒ prevent, reduce land degradation; restore/rehabilitate land
- ☐ conserve ecosystem
- ☐ protect a watershed/ downstream areas – in combination with other Technologies
- ☒ preserve/ improve biodiversity
- ☐ reduce risk of disasters
- ☐ adapt to climate change/ extremes and its impacts
- ☒ mitigate climate change and its impacts
- ☐ create beneficial economic impact
- ☒ create beneficial social impact

Purpose related to land degradation

- ☒ prevent land degradation
- ☒ reduce land degradation
- ☐ restore/ rehabilitate severely degraded land
- ☐ adapt to land degradation
- ☐ not applicable

SLM group

- forest plantation management
- improved ground/ vegetation cover

Land use

Land use mixed within the same land unit: No



Settlements, infrastructure

- Settlements, buildings

Water supply

- ☐ rainfed
- ☐ mixed rainfed-irrigated
- ☒ full irrigation

Degradation addressed



soil erosion by wind Et: loss of topsoil



biological degradation Bc: reduction of vegetation cover



other

Specify

Increase green spaces in settlements and create a more pleasant environment.

SLM measures

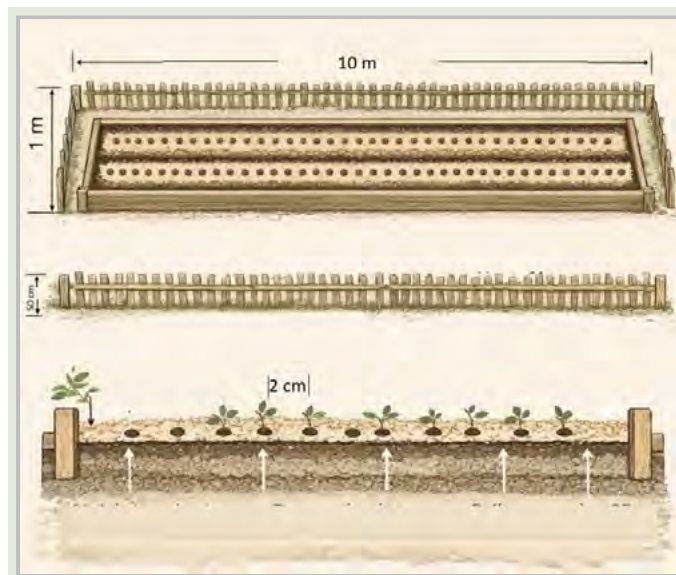


vegetative measures V1: Tree and shrub cover

TECHNICAL DRAWING

Technical specifications

1. Collecting seeds: Harvest the seeds from the end of August when the fruit is fully ripe.
2. Sowing time: In autumn, wash the collected seeds with water and sow before the ground freezes. In spring, soak the washed and dried seeds in water for 3-7 days in March, keep the moist ones in soil or sand, and sow them in the first 10 days of May.
3. Preparing the planting area: Plow the soil to a depth of 25 cm, collect plant debris, roots, and stones in the field, and build a planting bed.
4. Planting method: Water the soil before sowing, bury the seeds 6-7 cm apart, 2-3 cm deep, and compact them. Cover with 2 cm thick sawdust or sand.
5. Irrigation: After sowing, irrigation is carried out according to the procedure, and the soil moisture should be 40-70 percent.
6. Irrigation regime: 1 time in 10 days from April 20 to May 1, 1 time in 7 days from May 1 to August 15, 1 time in 3-5 days from June 15 to August 15, 1 time in 10-15 days from August 15 to September 15, and 2-3 weeks before the ground freezes, apply recharge irrigation.



ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated: per Technology unit (unit: **10** volume, length: **sq m**)
- Currency used for cost calculation: **MNT**
- Exchange rate (to USD): 1 USD = 3550 MNT
- Average wage cost of hired labour per day: 30000

Most important factors affecting the costs

Because the required infrastructure was unavailable to carry out this initiative directly, new materials were obtained. Given the increasing costs of fuel and construction materials in the local market, the absence of monoculture and seed resources, along with the low fertility of local natural soil, it will be essential to buy soil.

Establishment activities

1. Procur necessary materials (Timing/ frequency: Spring)
2. Establish fence (Timing/ frequency: Spring)
3. Soil mix (Timing/ frequency: Spring)
4. Collect seeds (Timing/ frequency: Autumn)

Establishment inputs and costs (per 10)

Specify input	Unit	Quantity	Costs per Unit (MNT)	Total costs per input (MNT)	% of costs borne by land users
Labour					
Seed collection	person-days	10	30 000.00	300 000.00	100
Soil processing and initial watering	person-days	7	30 000.00	210 000.00	100
Equipment					
Showel	pcs	5	15 000.00	75 000.00	50
Hammer	pcs	2	10 000.00	20 000.00	50
Watering container	pcs	15	20 000.00	300 000.00	50
Fertilizers and biocides					
Soil mix or fertilizer	kg	5	7 500.00	37 500.00	100
Construction material					
Wood for enclosure	cubic m	3	220 000.00	660 000.00	
Wood for fence	cubic m	3	120 000.00	360 000.00	
Pins	kg	1	7 500.00	7 500.00	
Total costs for establishment of the Technology (MNT)				1 970 000.00	
<i>Total costs for establishment of the Technology in USD</i>				<i>554.93</i>	

Maintenance activities

1. Sowing of seeds (Timing/ frequency: Spring/Autumn)
2. Watering (Timing/ frequency: Spring/Summer/Autumn)
3. Monitoring and measurements (Timing/ frequency: Spring/Summer/Autumn)
4. Prepare for transplantation (Timing/ frequency: Autumn, Spring (the following year))

Maintenance inputs and costs (per 10)

Specify input	Unit	Quantity	Costs per Unit (MNT)	Total costs per input (MNT)	% of costs borne by land users
Labour					
Watering	person-days	30	30 000.00	900 000.00	100
Monitoring	person-days	30	10 000.00	300 000.00	100
Total costs for maintenance of the Technology (MNT)				1 711 500.00	
<i>Total costs for maintenance of the Technology in USD</i>				<i>482.11</i>	
Specify input	Unit	Quantity	Costs per Unit (MNT)	Total costs per input (MNT)	% of costs borne by land users
Prepare for transplant	person-days	5	30 000.00	150 000.00	100
Seeding	person-days	2	30 000.00	60 000.00	100
Other					
Plant container	Pcs	100	3 000.00	300 000.00	100
Monitoring sheets	Pcs	1	1 500.00	1 500.00	100
Total costs for maintenance of the Technology (MNT)				1 711 500.00	
<i>Total costs for maintenance of the Technology in USD</i>				<i>482.11</i>	

NATURAL ENVIRONMENT

Average annual rainfall

- ☐ < 250 mm
- ☒ 251 – 500 mm
- ☐ 501 – 750 mm
- ☐ 751 – 1 000 mm
- ☐ 1 001 – 1 500 mm
- ☐ 1 501 – 2 000 mm
- ☐ 2 001 – 3 000 mm
- ☐ 3 001 – 4 000 mm
- ☐ > 4 000 mm

Agro-climatic zone

- ☐ humid
- ☒ sub-humid
- ☐ semi-arid
- ☐ arid

Specifications on climate

Dadal soum experiences a cool and humid climate. In the last decade, the average rainfall has been 3.2 mm during winter, 12.2 mm in spring, 104.8 mm in summer, and 17.6 mm in autumn, with winter snow cover averaging around 40 cm.

Slope

- ☐ flat (0-2%)
- ☒ gentle (3-5%)
- ☐ moderate (6-10%)
- ☐ rolling (11-15%)
- ☐ hilly (16-30%)
- ☐ steep (31-60%)
- ☐ very steep (>60%)

Landforms

- ☒ plateau/plains
- ☐ ridges
- ☐ mountain slopes
- ☐ hill slopes
- ☐ footslopes
- ☒ valley floors

Altitude

- ☐ 0 – 100 m a.s.l.
- ☐ 101 – 500 m a.s.l.
- ☒ 501 – 1 000 m a.s.l.
- ☒ 1 001 – 1 500 m a.s.l.
- ☐ 1 501 – 2 000 m a.s.l.
- ☐ 2 001 – 2 500 m a.s.l.
- ☐ 2 501 – 3 000 m a.s.l.
- ☐ 3 001 – 4 000 m a.s.l.
- ☐ > 4 000 m a.s.l.

Technology is applied in

- ☐ convex situations
- ☐ concave situations
- ☒ not relevant

Soil depth

- ☐ very shallow (0-20 cm)
- ☐ shallow (21-50 cm)
- ☐ moderately deep (51-80 cm)
- ☒ deep (81-120 cm)
- ☐ very deep (> 120 cm)

Soil texture (topsoil)

- ☐ coarse/ light (sandy)
- ☒ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Soil texture (> 20 cm below surface)

- ☐ coarse/ light (sandy)
- ☒ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Topsoil organic matter content

- ☐ high (>3%)
- ☒ medium (1-3%)
- ☐ low (<1%)

Groundwater table

- ☐ on surface
- ☐ < 5 m
- ☒ 5 – 50 m
- ☐ > 50 m

Availability of surface water

- ☐ excess
- ☐ good
- ☒ medium
- ☐ poor/ none

Water quality (untreated)

- ☒ good drinking water
 - ☐ poor drinking water (treatment required)
 - ☐ for agricultural use only (irrigation)
 - ☐ unusable
- Water quality refers to: both ground and surface water*

Is salinity a problem?

- ☐ Yes
- ☒ No

Occurrence of flooding

- ☐ Yes
- ☒ No

Species diversity

- ☒ high
- ☐ medium
- ☐ low

Habitat diversity

- ☒ high
- ☐ medium
- ☐ low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation

- ☒ subsistence (self-supply)
- ☒ mixed (subsistence/ commercial)
- ☐ commercial/ market

Off-farm income

- ☒ less than 10% of all income
- ☐ 10-50% of all income
- ☐ > 50% of all income

Relative level of wealth

- ☐ very poor
- ☐ poor
- ☒ average
- ☐ rich
- ☐ very rich

Level of mechanization

- ☒ manual work
- ☐ animal traction
- ☐ mechanized/ motorized

Sedentary or nomadic

- ☒ Sedentary
- ☐ Semi-nomadic
- ☐ Nomadic

Individuals or groups

- ☐ individual/ household
- ☒ groups/ community
- ☐ cooperative
- ☐ employee (company, government)

Gender

- ☒ women
- ☒ men

Age

- ☒ children
- ☐ youth
- ☐ middle-aged
- ☐ elderly

Area used per household

- ☒ < 0.5 ha
- ☐ 0.5 – 1 ha
- ☐ 1 – 2 ha
- ☐ 2 – 5 ha
- ☐ 5 – 15 ha
- ☐ 15 – 50 ha
- ☐ 50 – 100 ha
- ☐ 100 – 500 ha
- ☐ 500 – 1 000 ha
- ☐ 1 000 – 10 000 ha
- ☐ > 10 000 ha

Scale

- ☒ small-scale
- ☐ medium-scale
- ☐ large-scale

Land ownership

- ☒ state
- ☐ company
- ☐ communal/ village
- ☐ group
- ☐ individual, not titled
- ☐ individual, titled

Land use rights

- ☐ open access (unorganized)
- ☒ communal (organized)
- ☐ leased
- ☐ individual

Water use rights

- ☐ open access (unorganized)
- ☒ communal (organized)
- ☐ leased
- ☐ individual

Access to services and infrastructure

health	poor			good
education	poor			good
technical assistance	poor			good
employment (e.g. off-farm)	poor			good
markets	poor			good
energy	poor			good
roads and transport	poor			good
drinking water and sanitation	poor			good
financial services	poor			good

IMPACTS

Socio-economic impacts

The goal of ensuring the right of the population to live in a healthy and pleasant environment has been met.

Decreased Improved

Although not specifically measured, the area devoted to green spaces in the school environment has increased.

Socio-cultural impacts

community institutions

weakened strengthened

Quantity before SLM: 0
Quantity after SLM: 20
20 events organized for the promotion of the technology to community institutions.

SLM/ land degradation knowledge

reduced improved

The kids understood that using plant-based techniques could help lessen land degradation, and by their own actions, they encouraged their parents and guardians to show more interest in planting wild cherry across the soum.

Ecological impacts

vegetation cover

decreased increased

The area of bare soil on the school yards has decreased, and the area covered by vegetation has increased due to the planting of the cherry tree orchard.

Off-site impacts

Reduced Improved

Parents and guardians have begun using the seedlings that their children planted to grow monocot seedlings outside the school or in other parts of their yards.

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns	very negative					very positive
Long-term returns	very negative					very positive

Benefits compared with maintenance costs

Short-term returns	very negative					very positive
Long-term returns	very negative					very positive

The seedlings can be used for other local projects and programs, such as forest restoration and afforestation in floodplains.

CLIMATE CHANGE

Gradual climate change

annual temperature increase not well at all very well

Climate-related extremes (disasters)

heatwave	not well at all					very well
extreme winter conditions	not well at all					very well
drought	not well at all					very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1 – 10 %
- 11 – 50 %
- > 50 %

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- 0 – 10 %
- 11 – 50 %
- 51 – 90 %
- 91 – 100 %

Number of households and/ or area covered

Scaled to other schools, e.g. secondary school of Bayan-Uul soum, Dornod aimag

Has the Technology been modified recently to adapt to changing conditions?

- ✓ Yes
- No

To support the cherry tree seedling cultivation and boost productivity, the WWF Mongolia Program Office has donated an additional small greenhouse to the school.

To which changing conditions?

- ✓ climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- The technology relies on student initiative and has led to several positive outcomes, such as a shared goal of minimizing land degradation, fostering a conservation mindset, and offering conservation education.
- By showcasing the activities the children engage in to their parents and guardians, it has motivated local communities to take part in nature conservation efforts.
- Utilizing tree species that are common and beneficial in the area is viewed as a way to generate economic advantages in the future.

Strengths: compiler's or other key resource person's view

- The spread of locally beneficial plant species is a major factor in advancing this technology.
- The participation of parents and guardians also helps to enhance green areas in the community.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- In an open-nursery setting, seedling growth is limited and takes longer. — Using a greenhouse supports faster development and shortens the time between seeding and transfer to the grove or final planting area.
- The ongoing expenses for upkeep and trimming are not part of the school's budget. — The expenses related to ongoing costs can be covered by selling seedlings or swapping materials.
- The initiative will potentially lose its continuity due to the graduation of eco-club students who started the initiative. — Incorporate the initiative into the local school's curriculum as an extracurricular educational program.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- Long-term collaboration between educators and trainers is essential for the technology's sustainability. — The curriculum will be validated.
- The local demand for wild cherry seedling could fade away. — Create a continuous supply and demand chain for seedlings by enhancing collaboration with necessary afforestation programs.
- There is a chance that the educational institution's human resources will remain sustainable. — Broaden the regular development of human resource succession in education to include supportive activities involving not just biology or natural science teachers, but all staff.

REFERENCES

Compiler

Mandakh Nyamtseren

Editors

Tserendulam Tseren-Ochir

Reviewers

Jonas Chastonay
Rima Mekdaschi Studer
William Critchley

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Resource persons

Dorjhand Tumurbaatar - SLM specialist

Full description in the WOCAT database

<https://wocat.net/en/database/technologies/7824/>

Linked SLM data

Approaches: From Seed to Grove: Student-Led Bird Cherry Nursery <https://wocat.net/en/database/approaches/7813/>

Documentation was facilitated by

Institution

- World Wide Fund for Nature Mongolia Foundation (WWF Mongolia) - Mongolia

Project

- Global coordination project for the SFM Dryland Sustainable Landscapes Impact Program (GEF-FAO / DSL-IP)

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The students of the "Green Island" Eco-club at the General Education School in Dadal soum, Khentii province, are preparing for seedling planting and taking care of their seedlings. (Source from the project report)

From Seed to Grove: Student-Led Bird Cherry Nursery (Mongolia)

Үрээс төгөл хүртэл: Моносны суулгац бойжуулах сурагч төвтэй арга барил

DESCRIPTION

Through “learning by doing” students have propagated bird cherry seedlings, established a grove within the school grounds, and distributed seedlings to local households. This ecological education initiative has been put into practice though the “Thank you, Moilhon” programme initiated by a “Green Island” school Eco-Club.

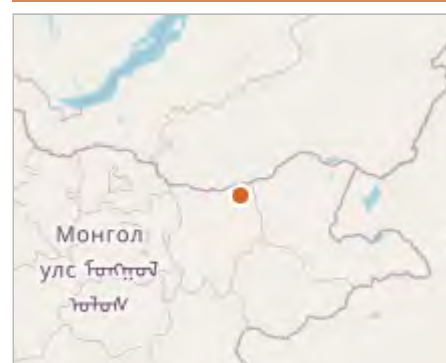
In Dadal soum, Khentii aimag, a “Green Island” school Eco-Club launched the “Thank You, Moilhon” campaign to turn ecological education into real, student-led practice. The “seed to grove approach” is based on the bird cherry (*Padus asiatica*). This tree was chosen because it is a native, climate-resilient species that grows in the local forest-steppe and river valleys, tolerates cold winters and dry, windy periods. Bird cherry seeds are abundant each year but are often left unused; so, students can scale-up planting without expensive inputs. Crucially it survives well after transplanting when properly watered. The bird cherry has clear local value: 1) its berries and blossom are liked by local people; 2) the tree supports biodiversity by providing food and shelter for birds and insects; 3) dense planting can reduce wind, and trap snow; and in this case; 4) a grove of the tree helps protect the school grounds.

Seeds are collected locally each year. Eco-club members, guided by teachers, gather ripe fruits and fallen seeds in nearby riparian areas, forest edges, shelterbelts, and public spaces. When collection takes place on private land, students coordinate with the household. Students then clean and dry the seeds, sow, and raise seedlings through all stages: nursery care, potting, hardening, and final transplanting. Since 2020, they have kept regular records of survival records and have developed practical seedling-raising guidance based on their own results.

The nursery system is based on school ownership and stewardship. The greenhouses and outdoor seedbed areas are located within the school yard and are managed by the school and the Eco-Club. With support from WWF-Mongolia’s programme office, the school received greenhouse equipment and essential materials (including water storage), and two 4×8 m greenhouses were set up for student training. The facilities remain part of the school’s assets. Outdoor nursery beds and the “Thank You, Moilhon” grove are also inside the school fence, where students, teachers, and community members jointly protect the site, maintain fencing, and carry out monitoring.

This hands-on system has produced visible outcomes and has motivated students to expand locally. From 2018 to 2021 they collected and propagated about 7 kg of seeds, and to date they have raised roughly 3,000 seedlings (ranging from 1-4 years old). They distributed 600 seedlings to 120 households (five per household) together with instructions. Furthermore, in August–September 2024 they transplanted around 1,000 seedlings into the school yard to establish a grove. A summer watering rota helped keep irrigation continuous during school holidays - an essential factor for survival in dry, windy conditions.

LOCATION



Location: School yard, Dadal soum, Khentii aimag, Dadal soum, Khentii province, Mongolia

Geo-reference of selected sites:

- 111.613564, 49.020277
- 111.613564, 49.020277

Initiation date: 2018

Type of Approach

- traditional/ indigenous
 - recent local initiative/ innovative
 - project/ programme based
 - ✓ other
- The local eco-club initiate the approach. The project by WWF Mongolia provided necessary finances to cover the costs.

The approach has since expanded to other areas, with eco-club students from Batshireet, Binder, Bayan-Adarga, Norovlin, and Bayan-Uul (Dornod Province) joining the initiative. A study visit was organized in June 2022. The initiative was promoted to the public; 210 children participated directly, and approximately 650 students were reached with information about the activity.



The students of the "Green Island" eco-club sharing their experiences during the "Climate Change and Youth" international conference. (B. Byambadelger, teacher)



The eco-club students planting and caring the seedling. (B. Byambadelger, teacher)

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims/ objectives of the Approach

The main goal of the "Thank you, Moilhon" campaign is to protect the environment with the participation of eco-club students, contribute to combating climate change and promote a responsible approach by encouraging local residents to adopt an eco-friendly lifestyle. The objectives are:

- To grow Bird cherry tree seedlings from bird cherry seeds and cultivate them in greenhouses and outdoor areas.
- To spread the culture of sustainable tree planting in the local community.
- To expand activities aimed at contributing to mitigating climate change.
- To develop leadership skills among eco-club students and enhance their knowledge of environmental protection.
- To exchange experiences and spread knowledge to others.
- To promote and raise awareness of the campaign's outcomes and best practices nationwide.
- To establish and protect a grove using bird cherry seedlings and create a system for its care and maintenance.

Conditions enabling the implementation of the Technology/ ies applied under the Approach

- **Social/ Cultural/ Religious Norms And Values:** The traditional knowledge and attitudes of local residents have aligned with sustainable management practices, positively influencing the adoption of technology.
- **Availability/ Access To Financial Resources And Services:** The WWF Mongolia provided financial support for this initiative.
- **Institutional Setting:** The eco-club students, eco-club teachers and the WWF Mongolia.
- **Collaboration/ Coordination Of Actors:** The students of the "Green Island" eco-club participated in the "Climate Change and Youth" international conference organized at the initiative of the President of Mongolia, U. Khurelsukh. During the conference, they presented their initiative, which captured their peers' interest. Furthermore, the leadership of the Ministry of Environment and Tourism in Mongolia and representatives of international organizations who attended the conference highly praised their efforts, emphasizing that it was an important contribution to addressing climate change adaptation.
- **Legal Framework (Land Tenure, Land And Water Use Rights):** The eco-club students' project initiative has been supported by the General Education Schools in Dadal, Batshireet, Binder, Bayankhongor, Norovlin soums /districts/ of Khentii province, as well as Bayan-Uul soum /district/ in Dornod province. They are planting seedlings on their own land, covering an area of 0.1 hectares and are carrying out watering and maintenance activities.
- **Knowledge About SLM, Access To Technical Support:** A study exchange meeting involving eco-club students from Batshireet, Binder, Bayandulag, Norovlin and Dornod provinces' Bayan-Uul and Dadal soums /districts/ was organized in June 2022 in Dadal. A total of 210 children participated in the meeting, outreach activities and dissemination efforts, while approximately 650 students were reached through promotional activities. Additionally, in August 2022, four students and one teacher from the "Green Island" eco-club participated in the "Climate Change and Youth" international conference, where they promoted the campaign to the public. The event helped strengthen students' knowledge of sustainable land management (SLM) by creating opportunities for peer learning, experience-sharing, and practical discussion on environmental protection, responsible natural resource use, and local action for land restoration.
- **Workload, Availability Of Manpower:** Teachers and staff from the general education schools in Dadal, Batshireet, Binder, Bayandulag, Norovlin and Bayan-Uul districts of Khentii and Dornod provinces supported and assisted the eco-club students in carrying out their activities.

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Availability/ Access To Financial Resources And Services:** Although the cost of equipment and services was high, the eco-club teachers, staff and students successfully implemented the project by utilizing their internal resources. For example, the school's staff, in collaboration with the students, built the fence and gate for the "Thank you, Moilhon grove" in 2024.

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?

teachers/ school children/ students

Specify stakeholders

Students from the "Green Island" Eco-club of Dadal soum, Khentii province and students from eco-clubs of Batshireet, Binder, Bayan-Adarga, Norovlin and Bayan-Uul soums in Khentii and Dornod provinces.

Describe roles of stakeholders

In 2019, students from the "Green Island" Eco-club in Dadal soum, Khentii province, initiated the "Thank you, Moilhon" campaign. Between 2019 and 2021, they collected a total of 7 kg of seeds and propagated seedlings. They grew and nurtured 3,000 seedlings, aged 1 to 4 years,

What stakeholders / implementing bodies were involved in the Approach?

Specify stakeholders

Describe roles of stakeholders

in both a greenhouse and outdoor areas. During the tree planting day in May 2024, 600 seedlings were distributed to 120 local residents, with each receiving 5 seedlings to plant in their yard. The students took turns watering and caring for the plants during the summer holidays. As of August 20, 2024, 1,000 seedlings, aged 3-4 years and standing 15-20 cm tall, were transplanted to establish a grove in Dadal soum. Additionally, they are sharing their experience with eco-club students from other sums and training them to expand the project. Students from other sums have already begun propagating seedlings within their school yards.

international organization

WWF Mongolia

The project activities were supported and received specific financial assistance.

other

Local community, parents, care takers

Supporting the children in the heavy works such as transport of soil, etc.

local land users/ local communities

Community households

They received seedlings from the nursery for planting on their own land (e.g. their backyards).

Involvement of local land users/ local communities in the different phases of the Approach

	none	passive	external support	interactive	self-mobilization	
initiation/ motivation	☐	☐	☐	☐	☒	The students of the "Green Island" Ecoclub in Dadal soum, Khentii province, as well as the students from ecoclubs in Batshireet, Binder, Bayankhongor, Norovlin and Bayan-Uul soums of Dornod province, have been involved in various activities. In 2019, the students of the "Green Island" Ecoclub in Dadal soum initiated the "Thank you, Moilhon" campaign. They shared their experiences with other ecoclubs in the provinces and soums and promoted the collection and planting of bird cherry seeds. They are working towards creating a forest of Bird cherry (Monos) by expanding their seedling cultivation efforts.
planning	☐	☐	☐	☐	☒	The teachers of the schools and the Ecoclub students collaborated to develop and implement the plan.
implementation	☐	☐	☒	☐	☐	The schools supported the initiative through policy and participation, while the financial support was provided by the WWF Mongolia. The WWF Mongolia supported and facilitated the following activities: - In 2019, a trial for planting Bird cherry trees was organized. - In 2022, a study tour meeting with the participation of Eco-club students from the Batshireet, Binder, Bayan-Adarga, Norovlin, Bayan-Uul and Dadal soums of Khentii and Dornod provinces was held in Dadal soum. - In September 2022, the children's initiative "Thank you, Moilhon" was promoted, and a 5-minute video was prepared and distributed nationwide. - Provided equipment such as two 4x8 meter greenhouses and water collection tanks.
monitoring/ evaluation	☐	☐	☐	☒	☐	The school management, teachers and staff are overseeing and supervising the work.

Flow chart

The flowchart illustrates the process of implementing an eco-club initiative, starting from idea generation and mobilization, followed by planning and implementation, and then continuing with maintenance and monitoring. This process leads to final results, while also promoting shared learning, resource planning, and practical environmental action.

Initiation and activation

- Initiate the process and select learning activities
- Engage the community and school (teachers and pupils) to participate in the selected activities

Planning and establishment

- Plan and organise participant involvement and capacity building
- Establish the SLM technology (cherry tree seedling nursery in the schoolyard) together with pupils and the local community

Maintenance and monitoring

- Maintain the SLM technology with pupils
- Monitor (1) participation and learning, led by teachers, and (2) the SLM technology (growth of seedlings in the nursery and trees in the grove) led by pupils

Author

N. Mandakh

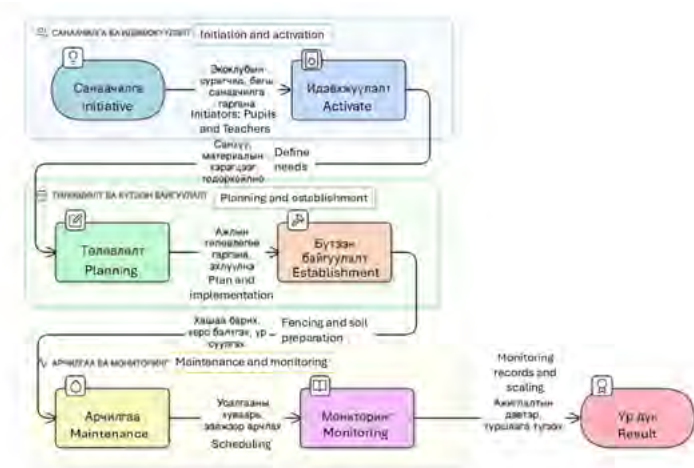
Decision-making on the selection of SLM Technology

Decisions were taken by

- land users alone (self-initiative)
- mainly land users, supported by SLM specialists
- all relevant actors, as part of a participatory approach
- mainly SLM specialists, following consultation with land users
- SLM specialists alone
- politicians/ leaders
- ✓ other Eco-club member students

Decisions were made based on

- evaluation of well-documented SLM knowledge (evidence-based decision-making)
- research findings
- ✓ personal experience and opinions (undocumented)



TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ✓ Capacity building/ training
- ✓ Advisory service
- ✓ Institution strengthening (organizational development)
- ✓ Monitoring and evaluation
- Research

Capacity building/ training

Training was provided to the following stakeholders

- ✓ land users
- field staff/ advisers
- ✓ other Eco-club students

Form of training

- ✓ on-the-job
- farmer-to-farmer
- ✓ demonstration areas
- ✓ public meetings
- courses
- ✓ other School program

Subjects covered

- Method of propagating with seeds.
- Collecting seeds.
- Preparing the planting area.
- Irrigating.

Advisory service

Advisory service was provided

- on land users' fields
- ✓ at permanent centres

When WWF Mongolia programme staff visit the school for other activities, relevant specialists provide advice and guidance to the students and the eco-club teacher, helping to further improve and refine the work.

Institution strengthening

Institutions have been strengthened / established

- no
- yes, a little
- yes, moderately
- ✓ yes, greatly

at the following level

- ✓ local
- regional
- national

Type of support

- ✓ financial
- ✓ capacity building/ training
- equipment

Describe institution, roles and responsibilities, members, etc.

The students of the "Green Island" Eco-Club in Dadal soum, Khentii Province, initiated and implemented this campaign, and students from the Eco-clubs in Batshireet, Binder, Bayan-Adarga, Norovlin, Dornod Province's Bayan-Uul and Dadal soums have started to carry out this activity.

Further details

The school administration supported the initiative through policy, and the WWF Mongolia provided financial support.

Monitoring and evaluation

The students of the eco-clubs have been measuring and keeping records of the seedlings they have been growing since 2019. They are monitoring such criteria as number of seedlings, survival rate, height, number of germinated seeds.

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- ☐ < 2 000
- ☒ 2 000 – 10 000
- ☐ 10 000 – 100 000
- ☐ 100 000 – 1 000 000
- ☐ > 1 000 000

The finances were provided by WWF Mongolia. The material costs covered were below 2000 USD. Additionally, trainings were provided by the project as well as the organisation of trips and conferences.

The following services or incentives have been provided to land users

- ☒ Financial/material support provided to land users
- ☒ Subsidies for specific inputs (including labour)
- ☐ Credit
- ☒ Other incentives or instruments

Financial/material support provided to land users

The financial support for tasks such as preparing the seedling plots, building greenhouses, setting up irrigation equipment and organizing experience-sharing meetings has been provided by the WWF Mongolia.

Subsidies for specific inputs

equipment : tools
shovels, watering buckets

partly financed
fully financed



agricultural : greenhouse
small greenhouse, water tanks, etc.



Labour by land users was

- ☒ voluntary
- ☐ food-for-work
- ☐ paid in cash
- ☐ rewarded with other material support

Other incentives or instruments

WWF covered the costs for trips and participation in conferences to share the technical know-how and introduce it to general education schools in other soums.

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

No
Yes, little
Yes, moderately
Yes, greatly

Did the Approach empower local land users, improve stakeholder participation?



The student-led initiative of the Eco-Club at Dadal General Education School has been successfully implemented in Dadal soum, Khentii Province. The approach has since expanded to other areas, with eco-club students from Batshireet, Binder, Bayan-Adarga, Norovlin, and Bayan-Uul (Dornod Province) joining the initiative. A study visit was organized in June 2022. The initiative was promoted to the public; 210 children participated directly, and approximately 650 students were reached with information about the activity.

Did the Approach enable evidence-based decision-making?



Since 2020, the eco-club students have been measuring and keeping records of the seedlings they have been growing. Based on their experience, they have developed their own method for preparing the seedlings.

Did the Approach help land users to implement and maintain SLM Technologies?



Households received seedlings to plant in their yards.

Did the Approach improve coordination and cost-effective implementation of SLM?



The approach improved coordination by linking students, teachers, the school administration, and local households around one shared activity: collecting discarded bird cherry seeds, raising seedlings, and planting them in school and household spaces.

Did the Approach mobilize/ improve access to financial resources for SLM implementation?



They distributed the seedlings they had raised not only to green the school grounds, but also for planting in local households' yards. By carrying out this kind of activity regularly, they are also creating opportunities to sell their seedlings.

Did the Approach improve knowledge and capacities of land users to implement SLM?



Since 2020, the Eco-club students have developed a method for propagating wild bird cherry seedlings based on their accumulated experience and have shared this knowledge with the public.

Did the Approach improve knowledge and capacities of other stakeholders?



In 2019, students from the "Green Island" Eco-Club in Dadal soum, Khentii aimag initiated a tree-planting effort by collecting bird cherry seeds. The initiative later expanded, and eco-club students from Batshireet, Binder, Bayan-Adarga, and Norovlin soums in Khentii aimag, as well as Bayan-Uul soum in Dornod aimag, learned from the experience and began raising seedlings on their own school grounds.

Did the Approach encourage young people/ the next generation of land users to engage in SLM?



The initiative led by the students of the "Green Island" Eco-club in Dadal, Khentii has expanded and is now being implemented by eco-club students in Batshireet, Binder, Bayan-Adarga, Norovlin and Bayan-Uul, Dadal soum in Khentii and Dornod provinces. As a result, students' environmental knowledge has improved and their experience in tree seedling cultivation and care has grown stronger.

Did the Approach improve issues of land tenure/ user rights that hindered implementation of SLM Technologies?



The land around the school may legally be used for activities, events, and equipment aimed at supporting children's development and helping them spend their free time in a proper and meaningful way. Therefore, since there is no specific clause in the law that directly addresses this situation, the school administration made a decision within its authority and carried out the necessary steps to formalize and officially approve it.

Main motivation of land users to implement SLM

- ☐ increased production
- ☐ increased profit(ability), improved cost-benefit-ratio
- ☐ reduced land degradation
- ☐ reduced risk of disasters
- ☐ reduced workload
- ☐ payments/ subsidies
- ☐ rules and regulations (fines)/ enforcement
- ☐ prestige, social pressure/ social cohesion
- ☐ affiliation to movement/ project/ group/ networks
- ☒ environmental consciousness
- ☐ customs and beliefs, morals
- ☒ enhanced SLM knowledge and skills
- ☒ aesthetic improvement
- ☐ conflict mitigation

Sustainability of Approach activities

Can the land users sustain what has been implemented through the Approach (without external support)?

- ☐ no
- ☐ yes
- ☒ uncertain

The long-term sustainability and expansion of the initiative are constrained by limited financial resources for fencing, irrigation, maintenance, and broader community outreach. In other words, the approach is institutionally and socially sustainable at a modest scale, but stronger financial support would be needed to sustain and expand it over the long term.

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- The initiative to collect and propagate bird cherry seeds and establish the "Thank you, Moilhon" grove. This demonstrates responsible and productive use of local natural resources. One important opportunity created by opening the grove is that it serves as a visible demonstration and learning site where students, teachers, residents, and visitors can observe the results of the initiative and learn from it directly. It also creates opportunities for environmental education, community participation, local pride, and the replication of similar activities in other schools and households. The seedlings and held the opening ceremony for the grove.
- The initiative started by the students of the "Green Island" Eco-Club in Dadal, Khentii Province, has expanded, and now students from Eco-Clubs in Batshireet, Binder, Bayan-Adarga, Norovlin, as well as Bayan-Uul and Dadal soums in Dornod Province, are also implementing the project.
- The campaign has been effective, and as of May 2024, approximately 3,000 bird cherry seedlings aged 1-4 years have been cultivated. In May 2024, on National Tree planting day, 600 seedlings were distributed to 120 households in Dadal soum, with each household receiving 5 seedlings. Care and watering recommendations were developed and provided. In September 2024, a grove named "Thank you, Moilhon" was established with 1,000 seedlings, in collaboration with the entire student body, teachers, and staff of the General Education School, and the opening ceremony of the grove was held.

Strengths: compiler's or other key resource person's view

- The environmentally-friendly initiative, initiated by the students of the "Green Island" Eco-club in 2019, demonstrates how the involvement of children and youth can effectively contribute to climate change adaptation and promote sustainable land use. By collecting discarded bird cherry seeds and establishing a bird cherry tree grove, this project showcases the positive impact of youth participation in environmental conservation efforts.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- The financial conditions are inadequate to ensure long-term sustainability. — Local support for this initiative and the inclusion of specific funding in the local budget.
- There is a lack of a system to support the participation of eco-club students. — Focus on improving student participation and support their involvement through encouragement and motivation.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- There is a lack of a system to encourage student participation in the eco-club. — Encouraging student participation through rewards, training and scholarships can support their involvement.
- There is a possibility that a clear plan for financing maintenance and irrigation costs in the long term has not been established. — Secure local budget support and develop a simple long-term maintenance plan with shared responsibilities.
- There is a possibility that local residents' involvement may be lacking. — Intensify efforts to spread knowledge and ensure involvement of local residents.

- The distribution of the seedlings grown by the students to local residents, along with providing guidance on planting, care and irrigation, has played a crucial role in raising awareness among the local community about environmental protection and the importance of tree planting. This collaboration has not only helped revitalize the community's engagement but also contributed significantly to improving their living environment.
- The implementation of the "Green Island" eco-club initiative and its practices by students from schools in other provinces and districts through their own eco-club activities is a crucial step for the sustainable continuation and successful execution of this initiative. This collaborative effort ensures the spread of the project's positive impact and fosters environmental awareness among a broader group of young people.

REFERENCES

Compiler

Tserendulam Tseren-Ochir

Editors

Mandakh Nyamtseren

Reviewers

Jonas Chastonay
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William Critchley

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Last updated 2026-06-08

Resource persons

Dorjkhand Tumurbaatar - SLM specialist

Full description in the WOCAT database

<https://wocat.net/en/database/approaches/7813/>

Linked SLM data

Technologies: Producing wild cherry seedlings in a schoolyard nursery <https://wocat.net/en/database/technologies/7824/>

Documentation was facilitated by

Institution

- World Wide Fund for Nature Mongolia Foundation (WWF Mongolia) - Mongolia

Project

- Global coordination project for the SFM Dryland Sustainable Landscapes Impact Program (GEF-FAO / DSL-IP)

Links to relevant information which is available online

- "Thank you, Moilhon" campaign information. — <https://mongolia.panda.org/news/?388176/------>
- "Thank you, Moilhon" campaign information. — <https://mongolia.panda.org/news/?375875/->
- "Thank you, Moilhon" campaign information. — <https://mongolia.panda.org/news/?371877/--->
- "Thank you, Moilhon" campaign information - Video — <https://www.youtube.com/watch?v=IIAPZk9gQk&pp=ygUMd3dmIG1vbmdvbGh>

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Preparing for silage (ABat-Erdene)

Household silage making in winter shelters (Mongolia)

Өвөлжөө түшиглэн өрхийн мал аж ахуйд шаардлагатай тэжээлийн дарш бэлтгэх

DESCRIPTION

Silage is a type of preserved, fermented fodder that is fed to livestock when grass is scarce or unavailable. Household-level silage production involves growing oats within winter/spring livestock shelters, chopping the harvested crop, and then compacting it in plastic tanks where it forms silage through an anaerobic process.

Household-level silage production combines fodder cultivation inside winter/spring livestock shelters with silage making in sealed plastic tanks. Silage is preserved, fermented fodder that is fed when grass is scarce or unavailable. A typical area of 0.2 hectares of oats produces 500 kg of silage. The main elements are:

(i) The establishment of a fodder plot within or adjacent to a winter/ spring shelter. These shelters are used for keeping livestock during winter and spring. A key resource is the large amount of dung (manure) accumulated in the shelter. Before cultivation, compacted dung layers are removed or broken up, then the soil is cultivated using small machines or hand tools. The dung improves both soil fertility and moisture retention.

(ii) After seedbed preparation, farmers sow oats (*Avina sativa*) as a reliable, fast-growing fodder cereal suited to the local steppe and short growing season. During summer, the plot is managed through watering and weeding typically 2–3 times. Management aims to maximize biomass while keeping the crop clean and harvestable. Projects (see section 2.7) supported land users with practical training and demonstrations on all aspects of production.

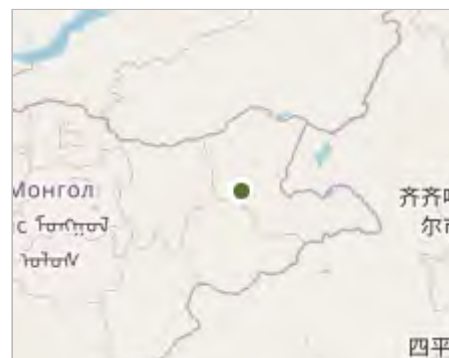
(iii) The whole oat plant is harvested and conserved as silage. Harvest is timed to ensure a balance between yield and quality; the crop is cut, chopped and packed in layers to remove air. The plastic tank is filled quickly, compacted firmly, and sealed immediately to initiate anaerobic fermentation. During feeding, the tank is opened carefully, and silage is removed in portions, keeping the remainder covered to reduce spoilage.

Silage making increases household self-reliance by producing and storing nutritious livestock fodder for winter and early spring, reducing the risk of feed shortages and the need for expensive emergency purchases. By resting parts of the shelter and nearby area from grazing during the growing season, it also supports better winter grazing and can reduce pressure on surrounding rangelands.

“Zud” is a severe winter disaster in Mongolia, often preceded by a summer drought, that leads to high livestock mortality due to a critical lack of forage. Silage-making is a key strategy used by herders to overcome this deficiency.

Key inputs include fencing (where needed), labour for dung removal, soil preparation, manure management and weeding; oat seed, basic hand tools or small machines for tillage and furrowing, and water for 2–3 irrigation events. Silage requires a chaff cutter

LOCATION



Location: Bulgan soum, Dornod aimag, Mongolia

No. of Technology sites analysed: 2 – 10 sites

Geo-reference of selected sites:

- 113.833885, 47.926849
- 113.691953, 47.826246
- 113.804901, 47.890210
- 113.851335, 47.894066

Spread of the Technology: applied at specific points/ concentrated on a small area

In a permanently protected area?: No

Date of implementation: 2022 ; less than 10 years ago (recently)

Type of introduction

- ☐ through land users' innovation
- ☐ as part of a traditional system (> 50 years)
- ☒ during experiments/ research
- ☒ through projects/ external interventions

tillage and furrowing, and water for 2–3 irrigation events. Silage requires a chaff cutter (owned or shared), plastic tanks/drums, and plastic sheets/rope for sealing. Skills in silage making and handling during storage and feeding are also essential. Land users benefit from more reliable winter feed reserves, improved livestock condition and survival in difficult seasons, and better use of shelter manure as fertilizer. They like the clear link between effort and results. However, there are constraints: these include labour peaks for dung removal, weeding, and harvest; the need for water and a chopper; and the cost/availability of plastic tanks and sealing materials, with spoilage risk if compaction or airtightness is inadequate.



Sowing seed (A. Bat-Erdene)



Forage oats grown in shelter for silage production (A. Bat-Erdene)

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- ☒ improve production
- ☐ prevent, reduce land degradation; restore/rehabilitate land
- ☐ conserve ecosystem
- ☐ protect a watershed/ downstream areas – in combination with other Technologies
- ☐ preserve/ improve biodiversity
- ☒ reduce risk of disasters
- ☒ adapt to climate change/ extremes and its impacts
- ☐ mitigate climate change and its impacts
- ☒ create beneficial economic impact
- ☐ create beneficial social impact

Purpose related to land degradation

- ☒ prevent land degradation
- ☒ reduce land degradation
- ☐ restore/ rehabilitate severely degraded land
- ☐ adapt to land degradation
- ☐ not applicable

SLM group

- rotational systems (crop rotation, fallows, shifting cultivation)
- integrated crop-livestock management

Land use

Land use mixed within the same land unit: Yes - Agro-pastoralism



Cropland

- Annual cropping : cereals - oats
- Cropping system: Maize or similar rotation with hay/pasture
- Is intercropping practiced? No
- Is crop rotation practiced? No



Grazing land

- Nomadism
- Animal type: cattle - dairy and beef (e.g. zebu), goats, horses, sheep
- Is integrated crop-livestock management practiced? No
- Products and services: manure as fertilizer/ energy production, meat, milk

Water supply

- ☐ rainfed
- ☒ mixed rainfed-irrigated
- ☐ full irrigation

Degradation addressed



soil erosion by water Wt: loss of topsoil/ surface erosion



soil erosion by wind Et: loss of topsoil



biological degradation Bc: reduction of vegetation cover

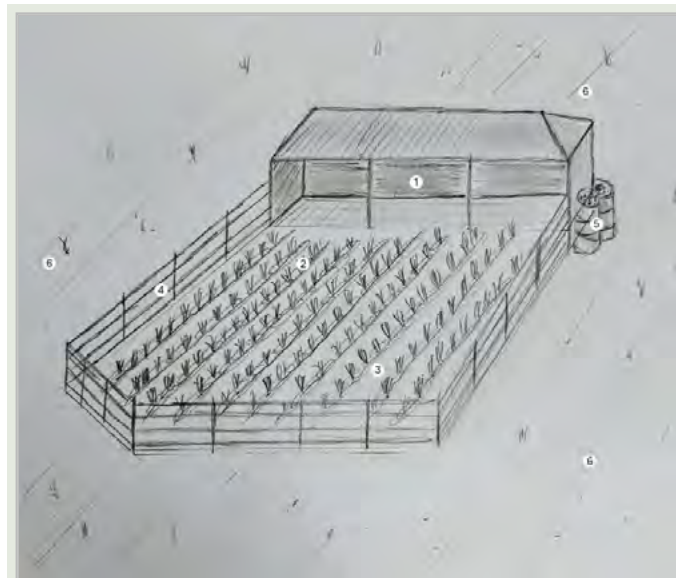
SLM measures



agronomic measures A1: Vegetation/ soil cover, A2: Organic matter/ soil fertility

Technical specifications

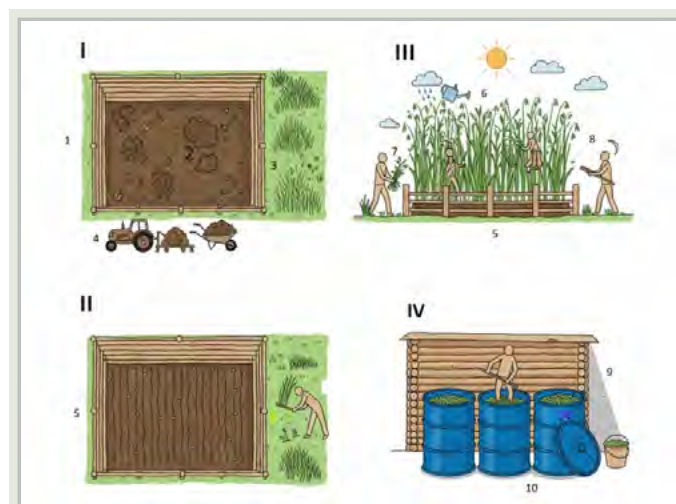
1. Shelter
2. Fodder crop strips (15-20 cm apart)
3. Manure (5kg dung per 200 l water)
4. Fenced fodder plot (2 ha)
5. Silage storage containers / plastic tanks
6. Surrounding pasture



Author: M. Nyamtseren / J. Chastonay

Technical specifications

1. Shelter walls
2. Fenced fodder plot
3. Resting pasture
4. Manure
5. Crop
6. Watering
7. Weeding
8. Harvesting
9. Chopping, packing, pressing
10. Silage



Author: A. Bat-Erdene

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated: per Technology area (size and area unit: **0.2 ha**)
- Currency used for cost calculation: **tugrug**
- Exchange rate (to USD): 1 USD = 3550 tugrug

Most important factors affecting the costs

The technology is deliberately designed to minimise financial costs, relying almost entirely on family labour, free on-site manure, and reused/shared equipment. The most important cost drivers are external market factors (oat seed price/availability), climate variability (rainfall affecting irrigation/weeding), and household labour capacity during seasonal peaks.

Establishment activities

1. Selection and cleaning of the fodder plot inside or adjacent to the winter/spring shelter (Timing/ frequency: Early spring (March – early April))
2. Procurement of tools such as basic hand tools and harrows (Timing/ frequency: Early spring (March – early April))
3. Procurement of silage storage tanks (Timing/ frequency: Early spring (March – early April))
4. Procurement of seeds (Timing/ frequency: Early spring (March – early April))
5. Dung recovery and initial manure preparation (Timing/ frequency: Late spring (May/ June))
6. Initial soil preparation (incl. application of dry manure) (Timing/ frequency: Late spring (May/ June))
7. Final seedbed preparation (Timing/ frequency: Late spring (May/ June))
8. Sowing of oats (Timing/ frequency: Late spring (May/ June))

Establishment inputs and costs (per 0.2 ha)

Specify input	Unit	Quantity	Costs per Unit (tugrug)	Total costs per input (tugrug)	% of costs borne by land users
Labour					
Total costs for establishment of the Technology (tugrug)				1 750 000.00	
<i>Total costs for establishment of the Technology in USD</i>				<i>492.96</i>	
Specify input	Unit	Quantity	Costs per Unit (tugrug)	Total costs per input (tugrug)	% of costs borne by land users
Plot cleaning	person-days	5	50 000.00	250 000.00	100
Dung recovery/preparation	person-days	3	50 000.00	150 000.00	100
Soil loosening/furrowing, manure spreading, sowing	person-days	2	50 000.00	100 000.00	100
Equipment					
Basic hand tools (shovels, forks, spades)	set	1	150 000.00	150 000.00	100
Harrows for dung breaking, soil loosening, furrowing	piece	1	200 000.00	200 000.00	
Plastic tank	piece	2	150 000.00	300 000.00	
Plant material					
Oat seeds	kg	50	12 000.00	600 000.00	
Total costs for establishment of the Technology (tugrug)				1 750 000.00	
<i>Total costs for establishment of the Technology in USD</i>				<i>492.96</i>	

Maintenance activities

1. Weed control (Timing/ frequency: Summer (June–July), 2–3 times)
2. Supplementary watering (Timing/ frequency: Summer (June–July), 2–3 times during dry spells)
3. Harvesting of oat biomass (Timing/ frequency: Late summer (August–September))
4. Chopping the harvested biomass (Timing/ frequency: Immediately after harvest)
5. Filling, compacting and sealing the plastic tanks for silage (Timing/ frequency: Immediately after chopping)
6. Storage monitoring and tank maintenance (Timing/ frequency: Autumn to early spring (September–April))
7. Careful feed-out and resealing during winter/early spring use (Timing/ frequency: Winter and early spring (November–April), daily or as needed)
8. Soil preparation (incl. dry manure application) (Timing/ frequency: Early spring)
9. Seeding (Timing/ frequency: Late spring)
10. Applying wet manure during fodder growth (Timing/ frequency: Summer (June–July))

Maintenance inputs and costs (per 0.2 ha)

Specify input	Unit	Quantity	Costs per Unit (tugrug)	Total costs per input (tugrug)	% of costs borne by land users
Labour					
weeding and watering (2–3 times)	person-days	6	50 000.00	300 000.00	100
harvest	person-days	1	50 000.00	50 000.00	100
chopping	person-days	1	50 000.00	50 000.00	100
Equipment					
Plastic tank (if damaged over winter)	piece	2	150 000.00	300 000.00	100
Other					
Transportation for checking, watering if necessary	km	100	3 600.00	360 000.00	100
Total costs for maintenance of the Technology (tugrug)				1 060 000.00	
<i>Total costs for maintenance of the Technology in USD</i>				<i>298.59</i>	

NATURAL ENVIRONMENT

Average annual rainfall

- ☐ < 250 mm
- ☒ 251 – 500 mm
- ☐ 501 – 750 mm
- ☐ 751 – 1 000 mm
- ☐ 1 001 – 1 500 mm
- ☐ 1 501 – 2 000 mm
- ☐ 2 001 – 3 000 mm
- ☐ 3 001 – 4 000 mm
- ☐ > 4 000 mm

Agro-climatic zone

- ☐ humid
- ☐ sub-humid
- ☒ semi-arid
- ☐ arid

Specifications on climate

Slope

- ☐ flat (0–2%)
- ☐ gentle (3–5%)
- ☒ moderate (6–10%)
- ☐ rolling (11–15%)
- ☐ hilly (16–30%)
- ☐ steep (31–60%)
- ☐ very steep (>60%)

Landforms

- ☒ plateau/plains
- ☐ ridges
- ☐ mountain slopes
- ☐ hill slopes
- ☐ footslopes
- ☐ valley floors

Altitude

- ☐ 0 – 100 m a.s.l.
- ☐ 101 – 500 m a.s.l.
- ☐ 501 – 1 000 m a.s.l.
- ☒ 1 001 – 1 500 m a.s.l.
- ☐ 1 501 – 2 000 m a.s.l.
- ☐ 2 001 – 2 500 m a.s.l.
- ☐ 2 501 – 3 000 m a.s.l.
- ☐ 3 001 – 4 000 m a.s.l.
- ☐ > 4 000 m a.s.l.

Technology is applied in

- ☐ convex situations
- ☐ concave situations
- ☒ not relevant

Soil depth ☐ very shallow (0-20 cm) ☐ shallow (21-50 cm) ☒ moderately deep (51-80 cm) ☐ deep (81-120 cm) ☐ very deep (> 120 cm)	Soil texture (topsoil) ☐ coarse/ light (sandy) ☒ medium (loamy, silty) ☐ fine/ heavy (clay)	Soil texture (> 20 cm below surface) ☐ coarse/ light (sandy) ☒ medium (loamy, silty) ☐ fine/ heavy (clay)	Topsoil organic matter content ☐ high (>3%) ☒ medium (1-3%) ☐ low (<1%)
Groundwater table ☐ on surface ☐ < 5 m ☒ 5 – 50 m ☐ > 50 m	Availability of surface water ☐ excess ☐ good ☐ medium ☒ poor/ none	Water quality (untreated) ☒ good drinking water ☐ poor drinking water (treatment required) ☐ for agricultural use only (irrigation) ☐ unusable <i>Water quality refers to: both ground and surface water</i>	Is salinity a problem? ☐ Yes ☒ No Occurrence of flooding ☐ Yes ☒ No
Species diversity ☐ high ☒ medium ☐ low	Habitat diversity ☐ high ☐ medium ☒ low		

Market orientation  subsistence (self-supply)  mixed (subsistence/ commercial  commercial/ market	Off-farm income  less than 10% of all income  10-50% of all income  > 50% of all income	Relative level of wealth  very poor  poor  average  rich  very rich	Level of mechanization  manual work  animal traction  mechanized/ motorized
Sedentary or nomadic  Sedentary  Semi-nomadic  Nomadic	Individuals or groups  individual/ household  groups/ community  cooperative  employee (company, government)	Gender  women  men	Age  children  youth  middle-aged  elderly
Area used per household  < 0.5 ha  0.5 – 1 ha  1 – 2 ha  2 – 5 ha  5 – 15 ha  15 – 50 ha  50 – 100 ha  100 – 500 ha  500 – 1 000 ha  1 000 – 10 000 ha  > 10 000 ha	Scale  small-scale  medium-scale  large-scale	Land ownership  state  company  communal/ village  group  individual, not titled  individual, titled	Land use rights  open access (unorganized)  communal (organized)  leased  individual Water use rights  open access (unorganized)  communal (organized)  leased  individual

IMPACTS

Indicator	Direction of Change	Quantity before SLM: 0	Quantity after SLM: 500 kg	Additional Information
fodder production	increased	0	500 kg	0.2 hectares for the 500 kg produced. Estimated from the lump sum forage production reported by the project.
fodder quality	increased	-	-	Previously, the technology herders purchased forage from the market. It might have been outdated and of poor quality. No measurements or monitoring were conducted, but it is clear that freshly grown and prepared silage would be of the highest quality.

animal production	decreased 	increased	With higher forage production, no livestock loss was seen. The improved quality of forage suggested better quality of livestock products, e.g. meat, milk.
water availability for livestock	decreased 	increased	Fresh silage is an excellent source of intrinsic moisture for livestock, typically containing 60% to 70% water, which acts as a direct source of hydration in addition to providing forage nutrients.
expenses on agricultural inputs	increased 	reduced	No inputs were made earlier; this time, herders needed to purchase seeds, a few small hand tools, and cover transportation costs to water forage, etc. However, on the flip side, this is seen as an investment during winter, particularly during zud events.
farm income	decreased 	increased	No loss of livestock would positively impact farm income.
workload	increased 	decreased	Besides herding and household works the herders have to do planting, watering which is unusual for their usual life style.

Off-site impacts

impact of greenhouse gases	increased 	reduced	There no measurements. winter shelters traditionally release high levels of methane and nitrous oxide due to the accumulation of barren manure and urine, the introduction of vegetation during the growing period can mitigate these emissions.
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COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns	very negative 	very positive
Long-term returns	very negative 	very positive

Benefits compared with maintenance costs

Short-term returns	very negative 	very positive
Long-term returns	very negative 	very positive

The benefits of the technology become most obvious during drought and dzud years, when stored fodder and silage can protect livestock and household livelihoods. In relatively good years, some herders may find the labour and costs of growing forage and making silage less attractive because natural pasture is sufficient. However, with stronger market mechanisms (e.g., reliable buyers, fair pricing, and local feed value chains), the technology can shift from a "risk-buffer" option to a high-benefit enterprise.

CLIMATE CHANGE

Gradual climate change

annual temperature increase	not well at all 	very well
annual rainfall decrease	not well at all 	very well
seasonal rainfall decrease	not well at all 	very well

Season: summer

Climate-related extremes (disasters)

extreme winter conditions	not well at all 	very well
drought	not well at all 	very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

-  single cases/ experimental
-  1 – 10 %
-  11 – 50 %
-  > 50 %

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

-  0 – 10 %
-  11 – 50 %
-  51 – 90 %
-  91 – 100 %

Number of households and/or area covered

15

Has the Technology been modified recently to adapt to changing conditions?

-  Yes
-  No

Because of the volume limits of the plastic tanks some herders modified it by preparing silage in a large underground pits.

To which changing conditions?

-  climatic change/ extremes
-  changing markets
-  labour availability (e.g. due to migration)
-  other volume of product

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- Provides reliable, high-quality winter and early-spring feed (≈500 kg from a 0.2 ha plot) that eliminates livestock losses even in bad years and removes the need for expensive emergency fodder purchases.
- Makes excellent use of the large amounts of dung already accumulated in the shelter as free, effective organic fertiliser, improving soil fertility and moisture retention without extra cost.
- Giving herders full control over their own feed supply and a strong sense of achievement

Strengths: compiler's or other key resource person's view

- Adapts well to climate change extremes by producing and conserving nutritious fodder exactly when natural pastures are unavailable.
- Creates strong potential for further economic and social benefits through equipment sharing, group learning, and development of local fodder value chains
- Actively reduces land degradation and prevents soil erosion (wind and water) by resting the shelter area and adjacent rangeland from grazing during the growing season

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- Workload clearly increases compared to traditional herding — Organising family or neighbour work groups during peak periods; sharing one chaff cutter among 3–5 households; using small hand tractors or animal-drawn tools where available
- Dependence on water access for 2–3 irrigation events during dry spells in the short growing season. — Switching to more drought-tolerant oat varieties if available; rain/snow water harvest in tanks
- Risk of spoilage if compaction, moisture content or airtight sealing is not perfect; plus limited storage volume of standard tanks — Repeated hands-on training (project method proved effective); practising on one tank first; covering tanks with earth or shade nets to protect from sun and animals; and adopting the local innovation of digging larger underground pits lined with plastic sheeting for extra volume.
- Purchasing oat seeds — Support establishment of locally sourcing oat seed storage.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- Poor sealing or wrong harvest timing can lead to total loss of a tank; adoption without follow-up support may fail. — Embedding refresher training and peer-to-peer farmer field schools; linking with local veterinary or extension services for annual checks.
- Dependence on purchased plastic materials in remote steppe areas where supply is irregular and long-term environmental footprint of plastic needs consideration. — Promoting durable, reusable tanks and encouraging repair/re-use; exploring locally produced alternatives; and including plastic recycling/collection in future project phases.
- Limited scale per household (0.2 ha average) and lack of developed fodder markets — Facilitating herder cooperatives for collective marketing of silage or hay; linking with livestock product buyers who value “dzud-resilient” herds

REFERENCES

Compiler

Mandakh Nyamtseren

Editors

Tserendulam Tseren-Ochir

Reviewers

Jonas Chastonay
Rima Mekdaschi Studer
William Critchley

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Last updated 2026-06-11

Resource persons

Tserendulam Tseren-Ochir - co-compiler
Mandakh Nyamtseren - Editor
Bat-Erdene Amarbat - SLM specialist

Full description in the WOCAT database

<https://wocat.net/en/database/technologies/7792/>

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Aerial view of Khoovriin Spring after protection, showing the fenced springhead and recovering vegetation within the protected enclosure. (UNDP Mongolia (ADAPT Project))

Protection and Sustainable Management of Khoovor Spring (Mongolia)

Хөөврийн булаг

DESCRIPTION

Khoovor Spring protection is a sustainable land management technology implemented in Dariganga Soum, Sukhbaatar Province, Mongolia. It uses a standardized livestock-exclusion fence, a controlled-access gate, and community-based inspection and maintenance to protect the natural spring source from livestock trampling and contamination. The protected area supports natural vegetation recovery and provides livestock with safer and more reliable access to water.

Protection and sustainable management of Khoovriin Spring is a site-specific sustainable land management technology implemented in 2022 at Khoovriin Spring in Dariganga Soum, Sukhbaatar Province, Mongolia. Before implementation, livestock had direct access to the springhead. Repeated trampling disturbed the wet soil and vegetation, increased soil compaction and sediment disturbance, and created a risk of water contamination. The spring is an important livestock water source for approximately 30 local herder households.

The technology protects the point where the spring emerges by installing a standardized livestock-exclusion fence. The structure consists of a galvanized steel frame, welded wire mesh, a lockable access gate, and an information sign. Preventing livestock from entering the springhead creates a protected buffer area within the enclosure, reduces physical disturbance and allows vegetation to regenerate naturally. Water remains accessible to livestock outside the protected springhead.

Implementation included assessment of the spring site, positioning of the enclosure, preparation of the technical design, fabrication and installation of the fence, installation of the gate and information sign, and final inspection. The same standardized engineering design and bill of quantities were used at ADAPT project sites in different provinces. At Khoovriin Spring, the enclosure was positioned according to the location and shape of the spring source while the standard technical specifications were retained.

Following construction, local land users participate in routine observation of the protected area and report damage requiring repair. Controlled access through the gate is retained for inspection and maintenance. Continued community participation is important for preventing unauthorized access and ensuring the long-term protection of the spring.

Field observations indicate that the fence has substantially reduced direct livestock access and trampling at the springhead. Vegetation is recovering within the protected area, and the spring source is visibly less disturbed and contaminated. Local users report safer and more reliable water access for livestock. However, systematic before-and-after measurements of spring discharge, water quality, soil conditions, and vegetation cover

LOCATION



Location: Khoovriin Spring, Dariganga Soum, Sukhbaatar province, Mongolia

No. of Technology sites analysed: single site

Geo-reference of selected sites:

- 114.367000, 45.950000

Spread of the Technology: applied at specific points/ concentrated on a small area

In a permanently protected area?: Yes

Date of implementation: 2022 ; less than 10 years ago (recently)

Type of introduction

- ☐ through land users' innovation
- ☐ as part of a traditional system (> 50 years)
- ☐ during experiments/ research
- ☒ through projects/ external interventions

were not available at the time of documentation. The reported benefits are therefore based mainly on field observations and information provided by the key resource person. The main limitations are the relatively high initial construction cost, possible damage to the fence from livestock or severe weather, and the need for regular inspection and timely repair. The technology can be replicated at other spring sources where livestock trampling and contamination are major problems, provided that local users agree on protection and maintenance responsibilities.



Khoovriin Spring before installation of the protection fence. Livestock had direct access to the springhead and drank directly from the source, causing trampling, sediment disturbance, and a risk of water contamination. (UNDP Mongolia (ADAPT Project))



Khoovriin Spring after installation of the livestock-exclusion fence. The enclosure protects the springhead from direct livestock access while allowing livestock to drink outside the protected source area. (UNDP Mongolia (ADAPT Project))

CLASSIFICATION OF THE TECHNOLOGY

Main purpose

- ☐ improve production
- ☒ prevent, reduce land degradation; restore/rehabilitate land
- ☒ conserve ecosystem
- ☐ protect a watershed/ downstream areas – in combination with other Technologies
- ☐ preserve/ improve biodiversity
- ☐ reduce risk of disasters
- ☒ adapt to climate change/ extremes and its impacts
- ☐ mitigate climate change and its impacts
- ☒ create beneficial economic impact
- ☒ create beneficial social impact

Purpose related to land degradation

- ☐ prevent land degradation
- ☒ reduce land degradation
- ☒ restore/ rehabilitate severely degraded land
- ☐ adapt to land degradation
- ☐ not applicable

SLM group

- area closure (stop use, support restoration)
- pastoralism and grazing land management
- surface water management (spring, river, lakes, sea)

Land use

Land use mixed within the same land unit: No



Grazing land

- Nomadism

Animal type: camels, cattle - dairy, goats, horses, sheep
Is integrated crop-livestock management practiced? No

Products and services: meat, milk, skins/ hides, wool, livestock grazing, livestock drinking-water supply, cashmere

Water supply

- ☒ rainfed
- ☐ mixed rainfed-irrigated
- ☐ full irrigation

Degradation addressed



chemical soil deterioration Cp: soil pollution



physical soil deterioration Pc: compaction



biological degradation Bc: reduction of vegetation cover



water degradation Hp: decline of surface water quality

SLM measures



structural measures S6: Walls, barriers, palisades, fences



management measures M2: Change of management/ intensity level

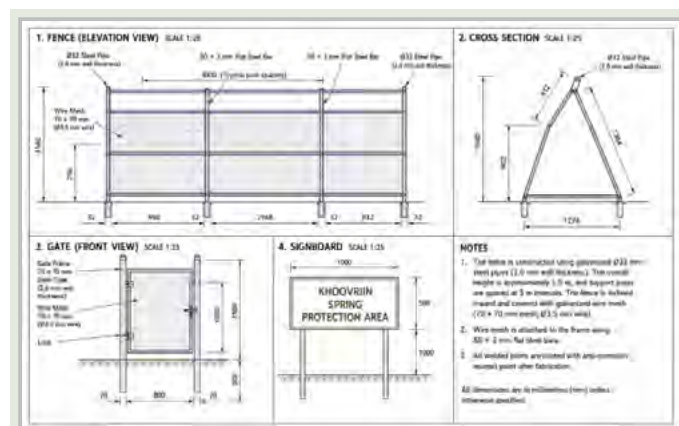
TECHNICAL DRAWING

Technical specifications

The standardized livestock-exclusion fence is constructed from galvanized Ø32 mm steel pipes with a wall thickness of 2.0 mm. Each fence module is 3.0 m wide. The fence is approximately 1.5 m high (1.56 m in the technical drawing) and has an inward-inclined A-frame cross-section with a base width of approximately 1.28 m. Support-post spacing: 3.0 m. The posts are connected using 50 × 3 mm flat steel bars. Galvanized welded wire mesh with a mesh size of 70 × 70 mm and a wire diameter of 3.5 mm is attached to the lower section of the fence.

A lockable steel gate approximately 0.8 m wide and 1.0 m high provides controlled access for inspection and maintenance. An information sign is installed at the entrance. All welded joints are coated with anti-corrosion enamel paint after fabrication.

The same standardized engineering design, technical specifications, input quantities, and approved unit budget were used at all ADAPT project sites. Only the positioning of the enclosure around each springhead was adapted to the local site. The cost estimate specifies 108 m² of wire mesh; this figure does not represent the total fence length. The total perimeter of the fence at Khoovriin Spring was not documented in the available design.



Author: IG LLC / UNDP Mongolia ADAPT Project

ESTABLISHMENT AND MAINTENANCE: ACTIVITIES, INPUTS AND COSTS

Calculation of inputs and costs

- Costs are calculated: per Technology unit (unit: **one standardized protected spring** volume, length:)
- Currency used for cost calculation: **MNT - Mongolian Tugrug**
- Exchange rate (to USD): 1 USD = 3450 MNT - Mongolian Tugrug
- Average wage cost of hired labour per day:

Most important factors affecting the costs

The main cost factors at Khoovriin Spring were the galvanized steel pipes, welded wire mesh, flat steel bars, gate and signboard, fabrication and welding, transportation to the site, and installation. Construction materials represented the largest direct cost component. There are no regular operating costs; any future repair costs would depend on the extent of damage and the cost of transporting replacement materials to the site.

Establishment activities

- Site verification and setting out of the fence alignment (Timing/ frequency: Spring; approximately 1–2 days)
- Transport of construction materials and equipment to Khoovriin Spring (Timing/ frequency: Spring; once before construction)
- Fabrication and welding of the standardized steel fence modules and access gate (Timing/ frequency: Spring; approximately 1–2 weeks)
- Installation and anchoring of the fence around the springhead (Timing/ frequency: Spring to early summer; approximately 1–2 weeks)
- Attachment of wire mesh, installation of the lockable gate and information sign, and application of anti-corrosion paint (Timing/ frequency: Immediately after frame installation; approximately 3–5 days)
- Final inspection and commissioning of the spring-protection fence (Timing/ frequency: Immediately after completion; approximately 1 day)

Establishment inputs and costs (per one standardized protected spring)

Specify input	Unit	Quantity	Costs per Unit (MNT - Mongolian Tugrug)	Total costs per input (MNT - Mongolian Tugrug)	% of costs borne by land users
Labour					
Fabrication and installation of the spring-protection fence at Khoovriin Spring	lumb sum	1	1 819 931.00	1 819 931.00	0
Equipment					
Construction machinery and equipment	lumb sum	1	396 962.00	396 962.00	0
Plant material					0
Fertilizers and biocides					0
Construction material					
Galvanized steel pipes, flat steel bars, welded wire mesh, gate components, paint, welding materials, and information sign	lumb sum	1	9 101 738.00	9 101 738.00	10
Other					
Transport, overhead, contractor's profit, VAT, construction supervision, and contingency	lumb sum	1	7 417 565.00	7 417 565.00	0
Total costs for establishment of the Technology (MNT - Mongolian Tugrug)				18 736 196.00	
<i>Total costs for establishment of the Technology in USD</i>				<i>5 430.78</i>	

Maintenance activities

- Informal observation of the fence, wire mesh, gate, and lock during normal use of the spring (Timing/ frequency: Ongoing throughout the year, during regular visits to the spring)
- Minor repair of damaged fence components, if required (Timing/ frequency: Only when damage occurs; no repairs had been required at the time of documentation)

NATURAL ENVIRONMENT

Average annual rainfall

- ☒ < 250 mm
- ☐ 251 – 500 mm
- ☐ 501 – 750 mm
- ☐ 751 – 1 000 mm
- ☐ 1 001 – 1 500 mm
- ☐ 1 501 – 2 000 mm
- ☐ 2 001 – 3 000 mm
- ☐ 3 001 – 4 000 mm
- ☐ > 4 000 mm

Agro-climatic zone

- ☐ humid
- ☐ sub-humid
- ☒ semi-arid
- ☐ arid

Specifications on climate

Average annual rainfall in mm: 237

Site-specific long-term average annual rainfall data were not available at the time of documentation. Rainfall is low, highly variable, and concentrated mainly during summer.

Slope

- ☒ flat (0-2%)
- ☒ gentle (3-5%)
- ☐ moderate (6-10%)
- ☐ rolling (11-15%)
- ☐ hilly (16-30%)
- ☐ steep (31-60%)
- ☐ very steep (>60%)

Landforms

- ☒ plateau/plains
- ☐ ridges
- ☐ mountain slopes
- ☐ hill slopes
- ☐ footslopes
- ☒ valley floors

Altitude

- ☐ 0 – 100 m a.s.l.
- ☐ 101 – 500 m a.s.l.
- ☐ 501 – 1 000 m a.s.l.
- ☒ 1 001 – 1 500 m a.s.l.
- ☐ 1 501 – 2 000 m a.s.l.
- ☐ 2 001 – 2 500 m a.s.l.
- ☐ 2 501 – 3 000 m a.s.l.
- ☐ 3 001 – 4 000 m a.s.l.
- ☐ > 4 000 m a.s.l.

Technology is applied in

- ☐ convex situations
- ☒ concave situations
- ☐ not relevant

Soil depth

- ☐ very shallow (0-20 cm)
- ☐ shallow (21-50 cm)
- ☒ moderately deep (51-80 cm)
- ☐ deep (81-120 cm)
- ☐ very deep (> 120 cm)

Soil texture (topsoil)

- ☐ coarse/ light (sandy)
- ☒ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Soil texture (> 20 cm below surface)

- ☐ coarse/ light (sandy)
- ☒ medium (loamy, silty)
- ☐ fine/ heavy (clay)

Topsoil organic matter content

- ☐ high (>3%)
- ☐ medium (1-3%)
- ☒ low (<1%)

Groundwater table

- ☒ on surface
- ☐ < 5 m
- ☐ 5 – 50 m
- ☐ > 50 m

Availability of surface water

- ☐ excess
- ☐ good
- ☐ medium
- ☒ poor/ none

Water quality (untreated)

- ☐ good drinking water
 - ☒ poor drinking water (treatment required)
 - ☐ for agricultural use only (irrigation)
 - ☐ unusable
- Water quality refers to: surface water*

Is salinity a problem?

- ☐ Yes
- ☐ No

Occurrence of flooding

- ☒ Yes
- ☐ No

Species diversity

- ☐ high
- ☒ medium
- ☐ low

Habitat diversity

- ☐ high
- ☒ medium
- ☐ low

CHARACTERISTICS OF LAND USERS APPLYING THE TECHNOLOGY

Market orientation

- ☐ subsistence (self-supply)
- ☒ mixed (subsistence/ commercial)
- ☐ commercial/ market

Off-farm income

- ☐ less than 10% of all income
- ☐ 10-50% of all income
- ☒ > 50% of all income

Relative level of wealth

- ☐ very poor
- ☒ poor
- ☒ average
- ☐ rich
- ☐ very rich

Level of mechanization

- ☒ manual work
- ☐ animal traction
- ☐ mechanized/ motorized

Sedentary or nomadic

- ☐ Sedentary
- ☐ Semi-nomadic
- ☒ Nomadic

Individuals or groups

- ☒ individual/ household
- ☒ groups/ community
- ☐ cooperative
- ☐ employee (company, government)

Gender

- ☒ women
- ☒ men

Age

- ☐ children
- ☒ youth
- ☒ middle-aged
- ☐ elderly

Area used per household

- ☐ < 0.5 ha
- ☐ 0.5 – 1 ha
- ☐ 1 – 2 ha
- ☐ 2 – 5 ha
- ☐ 5 – 15 ha
- ☐ 15 – 50 ha
- ☐ 50 – 100 ha
- ☐ 100 – 500 ha
- ☐ 500 – 1 000 ha
- ☐ 1 000 – 10 000 ha
- ☐ > 10 000 ha

Scale

- ☐ small-scale
- ☐ medium-scale
- ☐ large-scale

Land ownership

- ☒ state
- ☐ company
- ☐ communal/ village
- ☐ group
- ☐ individual, not titled
- ☐ individual, titled

Land use rights

- ☐ open access (unorganized)
- ☒ communal (organized)
- ☐ leased
- ☐ individual

Water use rights

- ☐ open access (unorganized)
- ☒ communal (organized)
- ☐ leased
- ☐ individual

Access to services and infrastructure

health	poor			good
education	poor			good
technical assistance	poor			good
employment (e.g. off-farm)	poor			good
markets	poor			good
energy	poor			good
roads and transport	poor			good
drinking water and sanitation	poor			good
financial services	poor			good

IMPACTS

Ecological impacts

vegetation cover decreased increased

Livestock exclusion has supported natural vegetation recovery within the fenced springhead area.

COST-BENEFIT ANALYSIS

Benefits compared with establishment costs

Short-term returns very negative very positive

Long-term returns very negative very positive

Benefits compared with maintenance costs

Short-term returns very negative very positive

Long-term returns very negative very positive

From the land users' perspective, the benefits are positive because the establishment costs were covered by the UNDP Mongolia ADAPT Project rather than by individual land users. The fence protects the springhead from direct livestock access, while no regular operating or scheduled maintenance costs are incurred. Long-term benefits depend on the fence remaining functional. Any future repair costs would be occasional and have not yet been quantified.

CLIMATE CHANGE

Gradual climate change

annual temperature increase not well at all very well

Climate-related extremes (disasters)

local sandstorm/ duststorm not well at all very well

local windstorm not well at all very well

extreme winter conditions not well at all very well

drought not well at all very well

ADOPTION AND ADAPTATION

Percentage of land users in the area who have adopted the Technology

- single cases/ experimental
- 1 – 10 %
- 11 – 50 %
- > 50 %

Of all those who have adopted the Technology, how many have done so without receiving material incentives?

- 0 – 10 %
- 11 – 50 %
- 51 – 90 %
- 91 – 100 %

Has the Technology been modified recently to adapt to changing conditions?

- Yes
- No

To which changing conditions?

- climatic change/ extremes
- changing markets
- labour availability (e.g. due to migration)

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- The fence prevents livestock from entering and trampling the springhead.
- Local herders reported more reliable access to water for livestock after the springhead was fenced.
- The protected enclosure supports natural vegetation recovery around the springhead.
- The Technology does not require regular operating expenditure after construction.

Strengths: compiler's or other key resource person's view

- The standardized fence provides a simple physical barrier that excludes livestock from the natural springhead.
- The Technology combines a durable structural measure with informal observation by local users.
- Livestock exclusion supports natural recovery of vegetation within the fenced area.
- The design can be replicated at other natural springs after adapting its layout and dimensions to site-specific conditions.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- No specific weakness or disadvantage was reported by the interviewed land users at the time of documentation. — Not applicable.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- The relatively high initial construction cost may limit replication without external financial support. — Prepare a site-specific design and budget and seek funding through local government programmes or development partners.
- The fence, gate, or wire mesh may be damaged by livestock or severe weather. — Local users should report damage when observed, and repairs should be arranged only when necessary by the responsible local authority or supporting organization.
- The Technology protects only the springhead and cannot address degradation across the wider rangeland. — Combine spring protection with appropriate grazing management and other rangeland restoration measures.

REFERENCES

Compiler

Undarmaa Dagvasuren

Editors

Jonas Chastonay
Mandakh Nyamtseren

Reviewers

Rima Mekdaschi Studer

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Resource persons

Bayarkhuu Gairan - SLM specialist

Full description in the WOCAT database

<https://wocat.net/en/database/technologies/7837/>

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Institution

- United Nations Development Programme Mongolia (UNDP Mongolia) - Mongolia

Project

- Improving Adaptive Capacity and Risk Management of Rural Communities in Mongolia (ADAPT)

Key references

- UNDP Mongolia. "Нутгийн олны 'далай' болсон Хөөврийн булаг." — <https://www.undp.org/mn/mongolia/stories/hutgiyn-olny-dalay-bolson-khoovriyn-bulag>
- IG LLC / UNDP Mongolia ADAPT Project. — Standardized technical design and cost estimate for spring-source protection fencing, 2023.

Links to relevant information which is available online

- UNDP Mongolia – Khoovriin Spring case study — <https://www.undp.org/mn/mongolia/stories/hutgiyn-olny-dalay-bolson-khoovriyn-bulag>
- UNDP Climate Change Adaptation – Khoovriin Spring video — <https://www.adaptation-undp.org/resources/videos/khouvri-spring-ocean-local-people-nutgiyn-olny-dalay-bolson-khoovriyn-bulag>

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Gender responsive capacity building training for women and young herders. (ADAPT Project)

Gender responsive capacity building and mentoring for climate-resilient rural livelihoods (Mongolia)

Эмэгтэйчүүд, залуу малчдад зориулсан жөндөрийн мэдрэмжтэй чадавх бэхжүүлэх сургалт

DESCRIPTION

This project based approach strengthens climate-resilient rural livelihoods among women and young herders in Khovd and Zavkhan provinces through gender-responsive online and face-to-face training, practical demonstrations, and post-training mentoring. It builds skills in low-waste cutting and sewing of Mongolian ger covers and insulation, and in the use of leather and rawhide for value-added products, supporting household use, income generation, and more efficient use of local livestock resources.

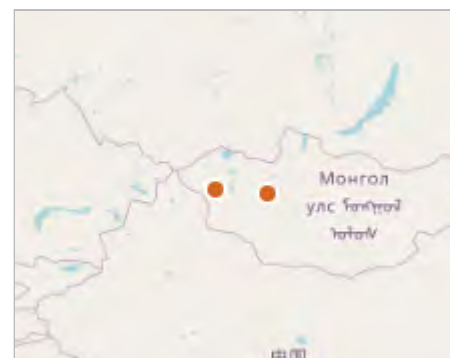
This Approach was implemented from January to May 2026 in 14 soums of Khovd and Zavkhan provinces as part of the ADAPT Project, financed by the Green Climate Fund and implemented by the Government of Mongolia, through the ministry responsible for environment and climate change, in partnership with UNDP. The provinces were predefined ADAPT target areas rather than locations selected specifically for this activity.

The Approach aimed to strengthen the adaptive capacity and livelihood opportunities of rural women and young herders through practical, locally relevant skills, diversified household production, better use of livestock-derived materials, and preservation of traditional knowledge. Its distinctive feature was a gender-responsive learning pathway combining online instruction, two-day face-to-face courses, practical demonstrations, supervised practice, printed and video materials, and post-training mentoring. A gender-awareness session addressed gender roles and stereotypes.

Training covered two areas: standardized, low-waste cutting and sewing of Mongolian ger covers and insulated components; and traditional processing and braiding of leather and rawhide into household and marketable products. Contributions to climate resilience and sustainable land management included reduced cutting waste, improved ger insulation, efficient material use, and productive use of leather and rawhide that might otherwise be discarded.

Implementation had five main stages: identifying participants and training needs; preparing learning materials and schedules; providing online theoretical instruction; conducting face-to-face demonstrations and supervised practice; and providing post-training mentoring and follow-up. The ADAPT Project provided the overall framework, financing, and technical guidance. The Mongolian Centre for Culture, Arts and Humanitarian Education NGO coordinated training, mentoring, and follow-up. Local authorities and community organizations supported outreach, participant selection, coordination, and logistics. Organizations supporting persons with disabilities facilitated inclusive participation. Trainers and master craftspeople delivered instruction and technical advice, while participants practised the skills, exchanged knowledge, and provided feedback.

LOCATION



Location: 14 soums across Khovd and Zavkhan provinces selected within the ADAPT Project's predefined target areas., Khovd and Zavkhan provinces (aimags), Mongolia

Geo-reference of selected sites:

- 91.641900, 48.005400
- 96.846700, 47.741700

Initiation date: 2026

Year of termination: 2026

Type of Approach

- traditional/ indigenous
- recent local initiative/ innovative
- ✓ project/ programme based

Stakeholders coordinated through the ADAPT Project's existing implementation arrangements, including direct communication and activity-based meetings. No separate committee or permanent coordination structure was established for this Approach.

The courses involved 57 participants in ger-cover cutting and sewing and 39 in leather and rawhide work. Follow-up conducted two to three months later showed that participants had begun applying their skills, making products, completing orders, and, in a few cases, earning income. These were early, self-reported results; longer-term impacts require further monitoring.

Participants valued hands-on learning, direct interaction with trainers, locally relevant skills, learning materials, and post-training advice. Their main concerns were the short training period and limited access to raw materials, equipment, finance, markets, and time during seasonal livestock activities. They requested longer and advanced courses, continued mentoring, business and marketing support, and better access to equipment and finance.



Participants practicing traditional leather and rawhide braiding techniques during a practical training session. (ADAPT project)



Women participants during a hands on training session on standard sewing of Mongolian ger covers. (ADAPT project)

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims/ objectives of the Approach

The main objective of the Approach is to strengthen the adaptive capacity and livelihood opportunities of rural women and young herders through gender-responsive capacity building and post-training mentoring. Specifically, it aims to develop practical skills in low-waste cutting and sewing of Mongolian ger covers and insulated components and in producing value-added leather and rawhide products; support household production, livelihood diversification, and income generation; promote the efficient use of locally available livestock resources and reduce material waste; preserve and share traditional knowledge; and increase participants' confidence and ability to apply their acquired skills. These objectives support climate resilience through improved ger insulation, more efficient use of materials, and diversified livelihood options.

Conditions enabling the implementation of the Technology/ ies applied under the Approach

- **Social/ Cultural/ Religious Norms And Values:** Traditional livestock-based livelihoods, existing sewing and craft skills, and strong interest in preserving and sharing traditional knowledge encouraged participation and peer learning.
- **Availability/ Access To Financial Resources And Services:** ADAPT Project funding supported training delivery, learning materials, practical demonstrations, mentoring, and follow-up activities.
- **Institutional Setting:** The ADAPT Project, the implementing NGO, local authorities, and training institutions provided organizational, technical, and logistical support.
- **Collaboration/ Coordination Of Actors:** Coordination among the project, implementing NGO, local authorities, community organizations, trainers, and participants supported participant selection, training delivery, mentoring, and follow-up.
- **Knowledge About SLM, Access To Technical Support:** Online and face-to-face training, practical demonstrations, manuals, videos, and post-training advice improved participants' practical knowledge and access to technical support.
- **Markets (To Purchase Inputs, Sell Products) And Prices:** Local demand, initial orders, and early sales encouraged some participants to continue production.

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Availability/ Access To Financial Resources And Services:** Limited access to finance restricted participants' ability to purchase raw materials, tools, and equipment or expand production.
- **Knowledge About SLM, Access To Technical Support:** Participants entered the training with different levels of experience, and some required longer training and continued guidance to apply the techniques independently and improve product quality.
- **Markets (To Purchase Inputs, Sell Products) And Prices:** Limited market linkages, marketing skills, and access to sales channels constrained regular commercialization and income generation.
- **Workload, Availability Of Manpower:** Lambing, cashmere combing, and other seasonal livestock and household responsibilities limited the time available for practice and production.

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?

local land users/ local communities

Specify stakeholders

Women and young herders from Khovd and Zavkhan provinces, including persons with disabilities and other interested rural residents.

Describe roles of stakeholders

Participated in online and face-to-face training and supervised practice, applied new skills in their households and small businesses, provided feedback through

What stakeholders / implementing bodies were involved in the Approach?

Specify stakeholders

Describe roles of stakeholders

follow-up surveys, and shared knowledge with family, peers, and community members. Some participants produced ger covers or leather and rawhide products for household use, orders, or sale.

community-based organizations

Local cooperatives, herder groups, and organizations supporting persons with disabilities in Khovd and Zavkhan provinces.

Supported outreach and participant mobilization, facilitated local coordination, and encouraged peer learning and knowledge sharing.

NGO

Mongolian Centre for Culture, Arts and Humanitarian Education NGO.

Acted as the lead implementing agency; planned and coordinated activities; prepared manuals and learning materials; engaged trainers; organized online and face-to-face training; provided post-training mentoring; and conducted follow-up monitoring and evaluation.

local government

Provincial and soum-level local government authorities in Khovd and Zavkhan provinces.

Supported participant identification and mobilization, local communication and coordination, logistical arrangements, and the organization of face-to-face training.

international organization

United Nations Development Programme (UNDP) Mongolia, through the ADAPT Project.

Provided project oversight, financing, technical guidance, and the overall framework for strengthening climate-resilient rural livelihoods.

other

Experienced trainers and craftspeople specializing in ger-cover sewing and traditional leather and rawhide work.

Delivered theoretical and hands-on instruction; demonstrated standardized, low-waste ger-cover cutting and sewing and traditional leather and rawhide braiding techniques; supervised practical work; and provided post-training technical advice.

Lead agency

Mongolian Centre for Culture, Arts and Humanitarian Education NGO

Involvement of local land users/ local communities in the different phases of the Approach

	none	passive	external support	interactive	self-mobilization	
initiation/ motivation		✓				Women, young herders, and other rural residents were informed about the planned training and invited to participate through local authorities and community networks. The activity itself was initiated by the ADAPT Project and the implementing NGO.
planning		✓				Prospective participants and community representatives were consulted about their training needs, previous experience, availability, and logistical requirements. The project team and implementing NGO used this information to finalize the training content and schedule.
implementation			✓			Women, young herders, and other rural residents participated in project-funded online and face-to-face courses, practical demonstrations, and supervised hands-on activities. The project provided trainers, learning materials, manuals, and resources for practical training.
monitoring/ evaluation		✓				Participants responded to follow-up surveys and interviews two to three months after the training. They reported how they had applied their skills, the products they had made or sold, the constraints they faced, the advice they had received, and their plans for further training and production.
Post-training mentoring and peer learning				✓		Participants contacted trainers by telephone and online channels to discuss challenges related to materials, cutting, braiding techniques, and product quality. Experienced participants also exchanged advice with peers, helping to identify practical solutions and additional support needs.

Flow chart

The flow chart illustrates the seven main stages of the Approach, from needs assessment and participant identification to follow-up monitoring and evaluation. It identifies the lead and supporting stakeholders at each stage and shows their roles and interactions throughout implementation. Stakeholders coordinated through the ADAPT Project's existing implementation arrangements, including direct communication and activity-based meetings. No separate committee or permanent coordination structure was established. Follow-up monitoring and evaluation was led by the Mongolian Centre for Culture, Arts and Humanitarian Education NGO, with support from trainers, local stakeholders, and participants.

Author

Undarmaa Dagvasuren

IMPLEMENTATION PROCESS AND STAKEHOLDER ROLES

Gender-responsive capacity building and post-training mentoring under the ADAPT Project



Decision-making on the selection of SLM Technology

Decisions were taken by

- ☐ land users alone (self-initiative)
- ☐ mainly land users, supported by SLM specialists
- ☒ all relevant actors, as part of a participatory approach
- ☐ mainly SLM specialists, following consultation with land users
- ☐ SLM specialists alone
- ☐ politicians/ leaders

Decisions were made based on

- ☐ evaluation of well-documented SLM knowledge (evidence-based decision-making)
- ☐ research findings
- ☐ personal experience and opinions (undocumented)
- ☒ other participatory needs assessment and stakeholder consultations, supported by technical expertise, traditional knowledge, and existing project documentation

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ☒ Capacity building/ training
- ☒ Advisory service
- ☒ Institution strengthening (organizational development)
- ☒ Monitoring and evaluation
- ☐ Research

Capacity building/ training

Training was provided to the following stakeholders

- ☒ land users
- ☐ field staff/ advisers

Form of training

- ☐ on-the-job
- ☐ farmer-to-farmer
- ☒ demonstration areas
- ☐ public meetings
- ☒ courses
- ☒ other Online theoretical instruction and post-training mentoring provided through telephone and online communication.

Subjects covered

Climate-change adaptation and climate-resilient livelihoods; standardized, low-waste cutting and sewing of Mongolian ger covers and insulated components; traditional leather and rawhide processing and braiding techniques; efficient and value-added use of livestock-derived materials; product-quality improvement; gender awareness; and basic business and income-generation skills.

Advisory service

Advisory service was provided

- ☐ on land users' fields
- ☐ at permanent centres
- ☒ other During training sessions, through post-training mentoring, follow-up visits, telephone consultations and online communication.

Project-based technical advice was provided by trainers and technical specialists during practical training and the post-training follow-up period. Participants received guidance on applying the production techniques, improving product quality, resolving technical problems, and using locally available materials. Additional support was provided through follow-up visits, telephone consultations, and online communication.

Institution strengthening

Institutions have been strengthened / established

- ☐ no
- ☒ yes, a little
- ☐ yes, moderately
- ☐ yes, greatly

at the following level

- ☒ local
- ☒ regional
- ☐ national

Describe institution, roles and responsibilities, members, etc.

The Approach strengthened working relationships and coordination among provincial and soum authorities, the Mongolian Centre for Culture, Arts and Humanitarian Education NGO, community organizations, organizations supporting persons with disabilities, trainers and master craftspeople, and participating land users. Local authorities supported participant identification, mobilization, local communication, coordination, and logistical arrangements. The implementing NGO coordinated training, mentoring, stakeholder communication, and follow-up monitoring. Trainers and master craftspeople provided technical instruction and post-training advice, while community organizations supported outreach, inclusion, and peer learning.

Type of support

- ☒ financial
- ☒ capacity building/ training
- ☐ equipment
- ☒ other Technical assistance, mentoring, stakeholder coordination, and follow-up monitoring.

Further details

The ADAPT Project provided financial and technical support for implementation. Institution strengthening focused on improving practical coordination and collaboration among provincial and soum authorities, the implementing NGO, community organizations, organizations supporting persons with disabilities, trainers, and participating land users. Joint participant identification, training preparation, local coordination, mentoring, and follow-up activities strengthened the stakeholders' experience and capacity to organize similar livelihood training activities.

However, this institutional strengthening occurred through temporary, activity-based working arrangements under the existing ADAPT Project structure. The Approach did not establish a new formal institution, permanent committee, coordination unit, legal mandate, staffing arrangement, or dedicated long-term budget. Stakeholders communicated directly and met as required for specific activities. Continued collaboration after project completion therefore depends on the existing mandates, resources, and commitment of the participating organizations.

Monitoring and evaluation

Monitoring and evaluation formed part of the Approach. Follow-up surveys and participant feedback were collected approximately two to three months after the training to document the application of acquired skills, challenges encountered, perceived changes, and recommendations for improving future activities. The available information mainly reflects short-term, self-reported results; no long-term impact assessment was conducted.

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- ☐ < 2 000
- ☐ 2 000 – 10 000
- ☒ 10 000 – 100 000
- ☐ 100 000 – 1 000 000
- ☐ > 1 000 000

Funding was provided by UNDP Mongolia through the ADAPT Project, and the Approach was implemented by the Mongolian Centre for Culture, Arts and Humanitarian Education NGO. The budget covered training preparation, online and face-to-face practical training, training materials, post-training mentoring, and monitoring and evaluation. The reported budget refers only to the activities described under this Approach and excludes other ADAPT Project components.

The following services or incentives have been provided to land users

- ☐ Financial/material support provided to land users
- ☒ Subsidies for specific inputs (including labour)
- ☐ Credit
- ☐ Other incentives or instruments

Impacts of the Approach

No
Yes, little
Yes, moderately
Yes, greatly

Did the Approach empower local land users, improve stakeholder participation?

Women, young herders, and other local participants contributed to identifying training needs, participated in practical activities, and provided follow-up feedback.

☐ ☒ ☐ ☐

Did the Approach enable evidence-based decision-making?

Follow up surveys and participant feedback informed improvements to subsequent activities. However, no baseline or long-term impact assessment was available.

☐ ☒ ☐ ☐

Did the Approach help land users to implement and maintain SLM Technologies?

Some participants reported applying the acquired production skills after the training. However, long-term adoption and continued use were not systematically measured.

☐ ☒ ☐ ☐

Did the Approach improve coordination and cost-effective implementation of SLM?

Coordination improved through collaboration among the ADAPT Project, the implementing NGO, trainers, and local governments. Cost-effectiveness was not formally assessed.

☐ ☒ ☐ ☐

Did the Approach improve knowledge and capacities of land users to implement SLM?

Practical training, demonstrations, and mentoring improved participants' technical knowledge and production skills, based on training observations and follow-up feedback.

☐ ☐ ☒ ☐

Did the Approach improve knowledge and capacities of other stakeholders?

Joint implementation improved the experience of the NGO, trainers, and local authorities in coordinating capacity-building and follow-up activities. No formal capacity assessment was conducted.

☐ ☒ ☐ ☐

Did the Approach build/ strengthen institutions, collaboration between stakeholders?

The Approach strengthened working relationships among local governments, the implementing NGO, trainers, and communities. However, no new institution or permanent coordination mechanism was established.

☐ ☒ ☐ ☐

Did the Approach empower socially and economically disadvantaged groups?

Women, young herders, and persons with disabilities were specifically targeted and included in the activities. Broader social and economic empowerment outcomes were not measured.

☐ ☒ ☐ ☐

Did the Approach improve gender equality and empower women and girls?

Women were a priority target group and gained access to practical training and mentoring. Changes in decision-making power, income, or gender equality were not quantitatively assessed.

☐ ☒ ☐ ☐

Did the Approach encourage young people/ the next generation of land users to engage in SLM?

Young herders participated in the training and were encouraged to apply value-added livelihood skills. Their long-term engagement was not assessed.

☐ ☒ ☐ ☐

Did the Approach improve the capacity of the land users to adapt to climate changes/ extremes and mitigate climate related disasters?

The Approach promoted livelihood diversification and improved use of locally available livestock-derived materials. Direct changes in climate resilience were not measured.

☐ ☒ ☐ ☐

Did the Approach lead to employment, income opportunities?

Participants gained skills that may support household production and income generation. Verified data on employment, sales, or increased income were unavailable.

☐ ☒ ☐ ☐

Main motivation of land users to implement SLM

- ☐ increased production
- ☒ increased profit(ability), improved cost-benefit-ratio
- ☐ reduced land degradation
- ☐ reduced risk of disasters
- ☐ reduced workload
- ☐ payments/ subsidies
- ☐ rules and regulations (fines)/ enforcement
- ☐ prestige, social pressure/ social cohesion
- ☒ affiliation to movement/ project/ group/ networks
- ☐ environmental consciousness
- ☐ customs and beliefs, morals
- ☒ enhanced SLM knowledge and skills
- ☐ aesthetic improvement
- ☐ conflict mitigation

Sustainability of Approach activities

Can the land users sustain what has been implemented through the Approach (without external support)?

- ☐ no
- ☐ yes
- ☒ uncertain

Sustainability remains uncertain. Participants gained practical skills and can use locally available materials, but long-term continuation without external support has not been verified. Limited access to equipment, raw materials, finance, markets, and continued technical advice may constrain sustained adoption.

Strengths: land user's view

- Participants valued the practical, hands-on training, which strengthened their technical skills and confidence in producing value-added products.
- Participants saw opportunities to use locally available livestock-derived materials for household production and potential income generation.
- Post-training mentoring and technical advice helped participants address practical problems and improve their production techniques and product quality.
- The training provided opportunities for participants to exchange experiences, share knowledge, and learn from trainers and peers.
- The use of locally available livestock-derived materials made the promoted production techniques relevant to local livelihoods and traditional skills.

Strengths: compiler's or other key resource person's view

- The Approach combined online learning, face-to-face practical training, and post-training mentoring, providing participants with complementary forms of learning and technical support.
- The Approach created a framework for coordination among provincial and soum-level governments, the implementing NGO, trainers, community organizations, and participants.
- Gender-responsive targeting increased opportunities for women, young herders, and persons with disabilities to participate in practical skills development.
- The promoted production technologies have the potential to support livelihood diversification by adding value to locally available livestock-derived materials while preserving traditional sewing, leather, and rawhide skills.
- The combination of needs assessment, practical training, mentoring, and follow-up could be adapted to other rural areas, subject to local needs, available resources, market conditions, and institutional capacity.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- Limited access to suitable raw materials, tools, and production equipment constrained participants' ability to apply the acquired skills. — Improve access through cooperative purchasing, shared tools and equipment, and stronger links with local suppliers and appropriate support programmes.
- Limited market access and weak marketing channels reduced opportunities to sell value-added products. — Conduct basic market assessments and strengthen product quality, branding, buyer linkages, and participation in local exhibitions and online sales platforms where feasible.
- Seasonal livestock activities and household responsibilities limited the time available for training and practice. — Schedule training outside peak livestock periods, such as lambing, kidding, and cashmere combing, and provide flexible sessions and recorded learning materials.
- Some participants required additional technical support to improve product quality and confidence. — Provide refresher and advanced training, longer-term mentoring, practical manuals, and peer-learning opportunities.
- Limited financial resources constrained participants' ability to purchase equipment and expand small-scale production. — Strengthen business-planning and savings skills and connect interested participants with suitable existing grant, revolving-fund, or microfinance opportunities.

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- The training and mentoring period was relatively short, limiting the ability to support and assess long-term adoption of the promoted techniques. — Extend the mentoring and follow-up period and provide scheduled follow-up visits, remote technical advice, and refresher training.
- Limited market analysis and business-development support constrained participants' ability to identify buyers and commercialize their products. — Conduct market assessments and strengthen product quality, branding, buyer linkages, business-development services, and access to suitable marketing platforms.
- Dependence on project-based funding creates a risk that training, mentoring, and follow-up activities may not continue after project completion. — Integrate suitable activities into local government plans and budgets, develop local mentors, and strengthen partnerships with community organizations, cooperatives, and service providers.
- Participants' limited access to finance constrained investment in tools, equipment, and small-scale production. — Promote phased investment, savings groups, shared equipment, and referrals to appropriate existing grant or microfinance programmes, accompanied by business-planning support.
- Monitoring focused mainly on short-term, self-reported outcomes, providing limited evidence of long-term adoption and livelihood impacts. — Establish baseline information and conduct follow-up assessments after six and twelve months using clear indicators for skill application, technology adoption, production, sales, income, participation, and climate-resilience outcomes.

REFERENCES

Compiler

Undarmaa Dagvasuren

Editors

Mandakh Nyamtseren

Reviewers

Rima Mekdaschi Studer

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Resource persons

Bayarkhuu Gairan - SLM specialist

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Key references

- Online and Practical Training on Standard Sewing of Mongolian Ger Covers and Value-Added Leather and Rawhide Products. Mongolian Centre for Culture, Arts and Humanitarian Education NGO, 2026. ISBN not available. — Internal project report available upon request from the Mongolian Centre for Culture, Arts and Humanitarian Education NGO. Not publicly published; no cost indicated.

Links to relevant information which is available online

- Improving Adaptive Capacity and Risk Management of Rural Communities in Mongolia (ADAPT Project) — <https://www.undp.org/mongolia/projects/improving-adaptive-capacity-and-risk-management-rural-communities-mongolia>

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Herders transporting their ger and household belongings by camel during seasonal migration. (Bayar, D)

Traditional Seasonal Mobility of Zereg Pastoralists (Mongolia)

Zergiin Nuudel

DESCRIPTION

The Traditional Seasonal Mobility of Zereg herders is a community-based approach that promotes sustainable pasture management through seasonal livestock migration based on traditional knowledge, collective planning, and adaptive decision-making. It enhances rangeland conservation, livestock productivity, and climate change adaptation while preserving traditional nomadic culture and strengthening local cooperation.

The Traditional Seasonal Mobility Approach of Zereg is a traditional, community-based approach practised by pastoralist households in Zereg Soum, Khovd Province, Mongolia. It is based on the seasonal movement of livestock between spring, summer, autumn, and winter pastures. Grazing areas are used rotationally according to pasture conditions, water availability, weather patterns, and livestock needs.

The main objective of the approach is to sustain traditional seasonal livestock mobility while ensuring the sustainable use of pasture resources and maintaining rangeland health and carrying capacity. It also aims to preserve indigenous knowledge and Mongolia's nomadic cultural heritage, strengthen cooperation among herder households, improve the long-term sustainability of pastoral livelihoods, and create potential opportunities for livelihood diversification, including community-based tourism based on nomadic traditions.

Implementation relies primarily on the indigenous knowledge and long-term experience of elder herders and herder households. Before each seasonal migration, they assess pasture conditions, vegetation growth, water availability, weather conditions, and livestock health to determine the timing and destination of the movement. Herder households consult family members, elder knowledge holders, and neighbouring herders to coordinate migration routes, seasonal camps, and grazing areas.

Pasture conditions, livestock performance, water availability, and climatic conditions are continuously monitored throughout the year by the herders themselves, based on their local observations and accumulated experience. Local government authorities and researchers are not systematically involved in or providing support for this monitoring. The current lack of systematic government support reflects the institutional changes following livestock privatization in the 1990s, when the socialist collectives that had coordinated seasonal migration and provided logistical, veterinary, and pasture management services were dissolved. This contrasts with the socialist period (1954–1990s), when the soum collective provided coordinated support for seasonal migration, including planning, transport, pasture and water management, veterinary services and other logistical support while traditional seasonal mobility remained the basis of the system. This enables herder households to adapt their management flexibly to changing conditions.

LOCATION



Location: Zereg soum, Khovd province, Mongolia

Geo-reference of selected sites:

- 92.840000, 47.105800

Type of Approach

- ✓ traditional/ indigenous
- recent local initiative/ innovative
- project/ programme based

The main stakeholders are herder households, elder knowledge holders, family members, and neighbouring herders. Herders plan and carry out seasonal movements, coordinate pasture use, provide mutual assistance during migration, and pass traditional knowledge on to younger generations. Land users value the approach because seasonal rotational grazing helps maintain pasture productivity, supports livestock health and productivity, reduces vulnerability to droughts and dzuds, and preserves traditional knowledge, cultural identity, and community cooperation.

Herders also identify several challenges, including climate change, increasing pasture degradation, water scarcity, labour shortages, and the declining transmission of traditional knowledge to younger generations. These challenges could be addressed through stronger cooperation among herder households, improved herder-led pasture monitoring, better access to water, greater involvement of younger generations, support for quality-based livestock production, and the conservation and promotion of Mongolia's nomadic cultural heritage.



A herder household in Zereg Soum staying at its summer pasture until autumn. The household continues grazing its livestock at the summer campsite until the seasonal move to the autumn pasture. This illustrates the seasonal timing and flexible use of grazing areas within the traditional mobility system. (Buyanbal Damdin)



Neighbouring herders working together to erect a ger at a seasonal campsite. They cooperate in assembling the wooden wall frame and roof poles while establishing the new camp. (SEMOON STUDIO)

APPROACH AIMS AND ENABLING ENVIRONMENT

Main aims/ objectives of the Approach

The main objective of the approach is to sustain traditional seasonal livestock mobility as a means of achieving sustainable rangeland management. It promotes the sustainable use of pasture resources, maintains rangeland health and carrying capacity, prevents pasture degradation, and strengthens the resilience of pastoral communities to climate variability and change. The approach also aims to conserve traditional knowledge and Mongolia's nomadic cultural heritage, strengthen cooperation among herder households, support adaptive pasture management and collective decision-making, and improve the long-term sustainability of pastoral livelihoods.

Conditions enabling the implementation of the Technology/ ies applied under the Approach

- **Social/ Cultural/ Religious Norms And Values:** Traditional nomadic culture, customs, and indigenous knowledge support the implementation of the approach.
- **Institutional Setting:** The enabling environment is based on customary practices, traditional knowledge, informal cooperation among herder households, and seasonal migration planning carried out by the herders themselves.
- **Collaboration/ Coordination Of Actors:** Herder households, elder knowledge holders, family members, and neighbouring herders coordinate seasonal movements through informal consultation and mutual assistance. They jointly discuss the timing, routes, and seasonal grazing areas and help one another to dismantle, transport, and erect gers during migration.
- **Land Governance (Decision-Making, Implementation And Enforcement):** Seasonal pasture use is managed through customary practices, household decision-making, and informal consultation among neighbouring herders. There is no site-specific formal control mechanism within this approach.
- **Knowledge About SLM, Access To Technical Support:** Traditional knowledge and the experience of elder herders form the foundation of the approach.
- **Other:** Successful implementation of the approach depends on the appropriate consideration of climatic conditions, natural seasonal cycles, and pasture conditions.

Conditions hindering the implementation of the Technology/ ies applied under the Approach

- **Social/ Cultural/ Religious Norms And Values:** Changes in the lifestyle of younger generations and the weakening transmission of traditional knowledge hinder the continuity of the approach.
- **Availability/ Access To Financial Resources And Services:** Seasonal migration is financed and implemented primarily through the herders' own household resources. External financial and material support is limited or unavailable.
- **Legal Framework (Land Tenure, Land And Water Use Rights):** Uncertainty regarding pasture use and land-use rights may create challenges for maintaining traditional seasonal migration.
- **Markets (To Purchase Inputs, Sell Products) And Prices:** Market fluctuations affect the stability of herders' incomes.
- **Workload, Availability Of Manpower:** Seasonal migration is labour-intensive, and a shortage of household labour makes implementation more difficult.

PARTICIPATION AND ROLES OF STAKEHOLDERS INVOLVED

Stakeholders involved in the Approach and their roles

What stakeholders / implementing bodies were involved in the Approach?

local land users/ local communities

Specify stakeholders

Herder households and elder knowledge holders in Zereg soum

Describe roles of stakeholders

They plan and implement traditional seasonal migration, manage pasture

What stakeholders / implementing bodies were involved in the Approach?

community-based organizations

Specify stakeholders

Informal network of herder households and neighbouring herders in Zereg Soum (not formally registered).

Describe roles of stakeholders

sustainably, and pass indigenous knowledge on to younger generations.

They consult one another to coordinate the timing and routes of seasonal movements and the use of seasonal grazing areas. They provide mutual assistance in moving livestock and in dismantling, transporting, and erecting gers. Elder herders also pass practical knowledge on to younger household members.

Lead agency

Herder households of Zereg Soum

Involvement of local land users/ local communities in the different phases of the Approach

	none	passive	external support	interactive	self-mobilization	
initiation/ motivation	■	■	■	■	■	Herder households and elder traditional knowledge holders have practiced and maintained traditional seasonal livestock mobility for generations, drawing on their traditional knowledge and experience.
planning	■	■	■	■	■	Herder households consult elder knowledge holders, family members, and neighbouring herders to determine the timing and routes of seasonal movements and the use of seasonal grazing areas, based on pasture conditions, water availability, weather, and livestock needs.
implementation	■	■	■	■	■	Herder households and neighbouring herders implement seasonal mobility using their own labour and mutual assistance. They move livestock and help one another dismantle, transport, and erect gers at seasonal camps.
monitoring/ evaluation	■	■	■	■	■	Herders themselves continuously monitor pasture conditions, vegetation growth, water availability, weather, and livestock health. They adjust the timing and routes of seasonal movements based on local observations and accumulated experience. Local government authorities and researchers are not systematically involved.

Flow chart

The flow chart illustrates how traditional seasonal mobility is initiated, planned, coordinated, implemented, monitored, and adapted by herder households in Zereg Soum. Elder knowledge holders provide advice and pass traditional knowledge on to younger generations. Herder households consult family members and neighbouring herders informally to coordinate migration timing, routes, and seasonal grazing areas. Neighbouring households also provide mutual assistance when moving livestock and dismantling, transporting, and erecting gers. Herders themselves monitor pasture conditions, water availability, weather, and livestock health and adjust their movements accordingly. There is no formal hierarchy or fixed pasture allocation system, and local government authorities and researchers are not systematically involved. Monitoring, joint evaluation, and continuous learning inform the next planning cycle and support sustainable pasture use, community cooperation, climate resilience, and cultural continuity.

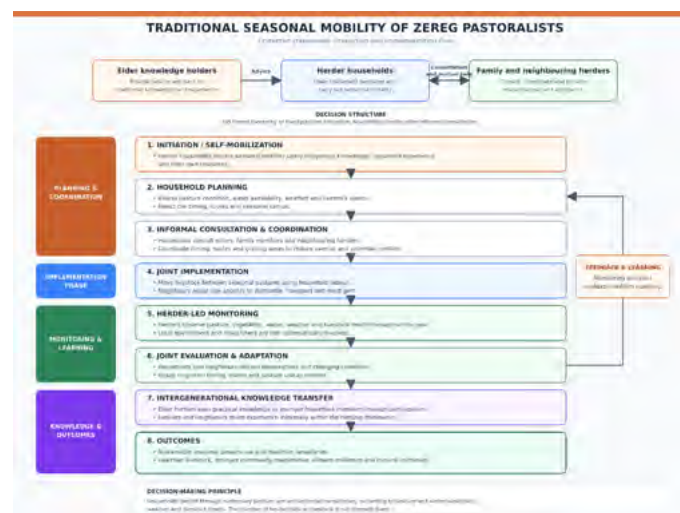
Author

Undarmaa Dagvasuren

Decision-making on the selection of SLM Technology

Decisions were taken by

- ✓ land users alone (self-initiative)
- mainly land users, supported by SLM specialists
- all relevant actors, as part of a participatory approach
- mainly SLM specialists, following consultation with land users
- SLM specialists alone
- politicians/ leaders



Decisions were made based on

- evaluation of well-documented SLM knowledge (evidence-based decision-making)
- research findings
- ✓ personal experience and opinions (undocumented)
- ✓ other Customary pasture-use practices and indigenous knowledge.

TECHNICAL SUPPORT, CAPACITY BUILDING, AND KNOWLEDGE MANAGEMENT

The following activities or services have been part of the approach

- ☐ Capacity building/ training
- ☐ Advisory service
- ☐ Institution strengthening (organizational development)
- ☒ Monitoring and evaluation
- ☐ Research

Monitoring and evaluation

Monitoring and evaluation are an integral part of the approach. Herders continuously observe pasture conditions, vegetation growth, water availability, weather conditions, and livestock health, and use this information to adjust the timing and routes of seasonal migration.

FINANCING AND EXTERNAL MATERIAL SUPPORT

Annual budget in USD for the SLM component

- ☒ < 2 000
- ☐ 2 000 – 10 000
- ☐ 10 000 – 100 000
- ☐ 100 000 – 1 000 000
- ☐ > 1 000 000

The approach is primarily implemented by herder households using their own resources and traditional knowledge. There is no dedicated annual budget or external donor funding for the implementation of the approach.

The following services or incentives have been provided to land users

- ☐ Financial/material support provided to land users
- ☐ Subsidies for specific inputs (including labour)
- ☐ Credit
- ☐ Other incentives or instruments

IMPACT ANALYSIS AND CONCLUDING STATEMENTS

Impacts of the Approach

No
Yes, little
Yes, moderately
Yes, greatly

Did the Approach empower local land users, improve stakeholder participation?

The approach strengthens the active participation of herder households in planning, implementing, and managing seasonal migration through indigenous knowledge and community cooperation.

☐ ☐ ☒ ☐

Did the Approach enable evidence-based decision-making?

Decisions are primarily based on indigenous knowledge and long-term experience rather than formal scientific evidence.

☒ ☐ ☐ ☐

Did the Approach help land users to implement and maintain SLM Technologies?

The approach enables the sustainable implementation and continuation of traditional seasonal migration.

☐ ☐ ☐ ☒

Did the Approach improve coordination and cost-effective implementation of SLM?

The approach relies on local resources, traditional practices, and cooperation among herder households.

☐ ☐ ☒ ☐

Did the Approach mobilize/ improve access to financial resources for SLM implementation?

The approach has not mobilized or improved access to additional financial resources. Seasonal migration is implemented by herder households using their own resources and voluntary labour, without external financial or material support.

☒ ☐ ☐ ☐

Did the Approach improve knowledge and capacities of land users to implement SLM?

Knowledge and practical skills are continuously exchanged between generations through traditional practice.

☐ ☐ ☐ ☒

Did the Approach improve knowledge and capacities of other stakeholders?

Researchers and local authorities are not directly involved in the approach; therefore, no measurable improvement in their knowledge or capacities has been observed.

☒ ☐ ☐ ☐

Did the Approach build/ strengthen institutions, collaboration between stakeholders?

Cooperation and mutual assistance among herder households and neighbouring herders are strengthened.

☐ ☐ ☐ ☒

Did the Approach mitigate conflicts?

Joint planning and traditional pasture-use practices help reduce conflicts over seasonal grazing areas.

☐ ☐ ☒ ☐

Did the Approach encourage young people/ the next generation of land users to engage in SLM?

Traditional knowledge is transferred from elder herders to younger generations through participation in seasonal migration.

☐ ☐ ☒ ☐

Did the Approach lead to improved food security/ improved nutrition?

Sustainable pasture management contributes to healthier livestock and more stable livestock production.

☐ ☐ ☒ ☐

Did the Approach improve access to markets?

The approach has not yet improved access to markets. Its current purpose is to sustain seasonal livestock mobility and the sustainable use of pastures. In the future, the preservation of traditional nomadic practices and landscapes could support community-based tourism and the marketing of local livestock products. However, this would require community organization, visitor services, transport, and stronger market linkages. This potential has not yet been realized.

☒ ☐ ☐ ☐

Did the Approach improve the capacity of the land users to adapt to climate changes/ extremes and mitigate climate related disasters? □ □ □ ☒

Seasonal migration is a key strategy for adapting to drought, dzud, and changing pasture conditions.

Did the Approach lead to employment, income opportunities? ✓ □ □ □

The approach has not yet created additional employment or income opportunities. Community-based tourism and value-added livestock products may provide future opportunities, but this potential has not yet been realized.

Main motivation of land users to implement SLM

- increased production
- increased profit(ability), improved cost-benefit-ratio
- ✓ reduced land degradation
- ✓ reduced risk of disasters
- reduced workload
- payments/ subsidies
- rules and regulations (fines)/ enforcement
- prestige, social pressure/ social cohesion
- affiliation to movement/ project/ group/ networks
- ✓ environmental consciousness
- ✓ customs and beliefs, morals
- ✓ enhanced SLM knowledge and skills
- aesthetic improvement
- conflict mitigation

Sustainability of Approach activities

Can the land users sustain what has been implemented through the Approach (without external support)?

- no
- ✓ yes
- uncertain

However, stronger cooperation among herder households and the continued transfer of traditional knowledge are important for addressing climate change, pasture degradation, and sustaining the approach for future generations.

CONCLUSIONS AND LESSONS LEARNT

Strengths: land user's view

- Seasonal rotational use of pastures helps to maintain rangeland carrying capacity and vegetation recovery. Hence, it improves livestock health and productivity, reduces the risks associated with drought and dzud.
- Strengthens cooperation among herder households and has the potential to diversify household income through tourism based on nomadic culture.
- Preserves traditional knowledge, customs, and nomadic cultural heritage.

Strengths: compiler's or other key resource person's view

- The approach represents an effective indigenous system for sustainable land management. It contributes to reducing pasture degradation, conserving biodiversity, and strengthening resilience to climate change.
- It supports the documentation and transmission of indigenous knowledge and promotes sustainable livestock production based on quality and productivity rather than increasing herd size.
- It offers opportunities to integrate nomadic cultural heritage with tourism, education, and research to support sustainable local development.

Weaknesses/ disadvantages/ risks: land user's view — how to overcome

- Climate change, including drought, dzud, water scarcity, and increasing pasture degradation, makes traditional seasonal migration more difficult. — Seasonal migration planning should be based on pasture conditions, water availability, and weather information while strengthening cooperation among herder households. Promoting livestock quality rather than herd size and developing tourism based on nomadic cultural heritage can further support the sustainability of traditional seasonal mobility.
- The declining transmission of indigenous knowledge to younger generations and shortages of household labour threaten the long-term sustainability of the approach. — Traditional knowledge should be transferred from elder herders to younger generations. Create incentives for the younger generation to continue practicing traditional seasonal mobility such as tourism and adding value to locally available livestock-derived materials

Weaknesses/ disadvantages/ risks: compiler's or other key resource person's view — how to overcome

- Climate change, pasture degradation, water scarcity, changing seasonal patterns, and increasing grazing pressure caused by growing livestock numbers present major risks to the traditional seasonal migration system. — Support traditional seasonal migration through local development policies and SLM strategies, strengthen pasture monitoring, improve livestock quality and productivity, encourage youth participation, and promote tourism and other livelihood opportunities based on nomadic cultural heritage.
- Gradual loss of indigenous knowledge and the influence of modern lifestyles threaten the continuity of nomadic culture and traditional migration practices. — Strengthen the documentation and transfer of indigenous knowledge by integrating it into education, training, and research, and by combining traditional knowledge with scientific information.

REFERENCES

Compiler

Undarmaa Dagvasuren

Editors

Mandakh Nyamtseren

Reviewers

Rima Mekdaschi Studer

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Resource persons

Buyanbal Damdin - land user

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Institution

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WOCAT Secretariat

Centre for Development and Environment
University of Bern
Mittelstrasse 43
3012 Bern, Switzerland
Tel.: +41 (0) 31 631 88 22
Email: wocat.cde@unibe.ch
Website: www.wocat.net