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PILOTING THE CLIMATE-SMART APPROACH IN THE LIVESTOCK PRODUCTION SYSTEMS

March 2022

SDGs:



Country:

Mongolia

Project Code:

TCP/MON/3703

FAO Contribution:

USD 250 000

Duration:

1 March 2019 – 30 November 2021

Contact Info:

FAO Representation in Mongolia
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Implementing Partner

Ministry of Food, Agriculture and Light Industry (MoFALI).

Beneficiaries

Seven herder households from Dundgovi province, eight herder households from Khentii province and eight small-scale dairy farmers from Tuv province.

Country Programming Framework (CPF) Outputs

CPF Priority Area 3. Output 3.5: Promotion of sustainable natural resources management as techniques for adaptation, mitigation and management for the impacts of climate change.



BACKGROUND

In Mongolia, the agriculture sector contributed 13.3 percent of gross domestic product (GDP) in 2017, the second largest sector following the mining sector. The contribution of the livestock sector to the agriculture GDP was 88 percent. Approximately 40 percent of the work force directly depends on the livestock sector and the sector is dominated by an extensive livestock production system dependent on access to grasslands and thus inherently vulnerable to climatic and natural resource management risks and climate change.

It has been estimated that average annual temperature in Mongolia increased two-fold between 1940 and 2013, around three times the global average. Climate change has a negative impact on animal productivity, animal health, biodiversity, the quality and amount of feed supply, and the carrying capacity of pastures. It has also led to the outbreak of new and re-emerging livestock diseases, and a change in disease patterns.

The absence of policy or market-based mechanisms to control livestock numbers and a lack of awareness regarding rangeland degradation has led to increasing herd sizes, producing acute limitations of forage and increasing desertification. In 2020, 76.9 percent of Mongolia's territory was affected by desertification. Permanent pastures and meadows occupy about 110.5 million ha (71.8 percent of the total territory of Mongolia); 65 percent of this pastureland is already degraded to some extent.

The livestock sector has seen a reduction in productivity and in economic efficiency. The fall in productivity is partly caused by the unsatisfactory functioning of animal breeding services in recent years. Livestock herders are also affected by such socio-economic issues as poverty, human health issues, social security and urban migration. A policy coherence review revealed that there was currently no policy document elaborating potential Climate Smart Livestock (CSL) solutions. The aim of the project was thus to assist in the creation of a favourable environment for an economically viable and competitive climate-resilient livestock sector, capable of providing safe and healthy food for the population and of increasing exports.

IMPACT

The project has had a significant impact on the promotion of a climate-smart approach in the livestock production systems of Mongolia and has made a significant contribution to the first three action points of Climate Smart Agriculture (CSA): i) expanding the evidence base for CSA; ii) supporting enabling policy frameworks; and iii) strengthening national and local institutions. Although the concept of CSA was introduced by FAO in 2010 and has since been reflected in the Nationally Determined Contributions (NDCs) of more than 30 countries around the world, it is still a new concept for Mongolia.

ACHIEVEMENT OF RESULTS

The expected outputs were successfully delivered. In addition to analysing policy coherence and the changing landscape of the livestock sector, the project successfully demonstrated CSL approaches in three different livestock production systems and strengthened the capacity to expand the evidence base. In close consultation with the Livestock Policy Implementation and Coordination Department of MoFALI, the project selected as beneficiaries two groups of herder households representing a small ruminant pastoral production system in a semi-arid ecological zone and an extensive cattle production system in the forest-steppe ecological zone, respectively, and a group of small-scale dairy farmers representing a semi-intensified cattle production system in the forest-steppe ecological zone. The Research Institute of Animal Husbandry (RIAH) provided technical support to establish forage plots in the three different sites, and to carry out training in CSL approaches for herders by developing a training manual, "Climate Smart Ruminant Production", consisting of nine modules.

At each experimental site, after detailed studies, wells 70 m deep were drilled with the installation of a solar-assisted pumping system, and fenced low-emission forage plots with an area of 2 ha were created. On the two pilot sites in the forest-steppe zone, alfalfa and oats were sown on 1 ha in each of the created plots. On the site in the semi-arid zone, taking into account the fragility of the soil and the significant vegetation cover, a pasture of 2 ha was fenced and cold- and drought-resistant local varieties of five types of annual and perennial fodder crops were manually planted on a small area (45 m²). Quarterly monitoring was carried out at all three pilot sites and records kept of measurements of body condition, live weight and milk yield of animals, and laboratory analyses of plant samples of the forage plots, as well as of animal faeces. Changes in greenhouse gas (GHG) emissions were estimated. The pilot project provided an opportunity for each of the sixteen beneficiary households on the two pilot sites with cultivated forage crops to harvest from five to six tonnes of green mass for the production of low-emission silage to increase the productivity of their cows while maintaining body condition in winter. The seven beneficiary households with a small ruminant production system have access to reserved pastures for grazing their new-born animals and the core reproductive herd in the spring, when access to productive pastures is usually very limited.

IMPLEMENTATION OF WORK PLAN AND BUDGET

The government took timely measures to prevent the influx of COVID 19, with the application of strict travel restrictions from February to May 2020. As a result, the project's planned field activities to generate evidence from the pilot sites on a seasonal basis could not be implemented. A one-year no-cost extension to complete activities was requested and approved. By the end of the project, 99.8 percent of project activities had been implemented within the planned budget. In terms of project performance, the risks caused by restrictive measures related to the COVID-19 pandemic were mitigated by the support and team spirit of the FAO Mongolia country office.

In addition to risks associated with COVID-19, herder households of Mongolia were affected in the winter of 2020-2021 by an extremely harsh winter that killed 1.6 million livestock, 98 percent of which was reported in six provinces of the country. At the official request of the government, FAO mobilized an emergency Technical Cooperation Programme fund to provide emergency fodder assistance to 1 000 vulnerable herder households in the six affected provinces.

After the approval of the emergency fund, however, livestock fodder prices increased by between 80 and 85 percent, and the mobilized fund for emergency feed interventions proved to be insufficient. In consultation with MoFALI, 55 tonnes of the total requirement of 455 tonnes of concentrate was purchased from the budget of this project in order to safeguard the livelihoods of 120 vulnerable herder households in Dundgovi province, where one of the pilot sites of the project was located.

FOLLOW-UP FOR GOVERNMENT ATTENTION

The five action points of CSA approaches are still not fully recognized by stakeholders, in particular policy-makers. In order to create a favourable policy framework that integrates policy objectives and investments, the site-specific findings of the piloted interventions for adopting CSL solutions in the three different livestock production systems need to be shared with diverse partners working in different sites and contexts of livestock production, climate change and food systems in Mongolia. In this context, it is recommended that funding and technical assistance be sought to improve the capacity of national and local institutions, funding and investment options, and to implement CSL practices at field level.

SUSTAINABILITY

1. Capacity development

Mongolia is still in transition to a climate-smart enabling environment for the livestock sector. To achieve the NDCs in line with the Paris Agreement and to increase the resilience of herder communities in line with the Sendai Framework for Disaster Risk Reduction, the government has begun to develop a national climate change adaptation programme for the agricultural sector, scheduled to commence in 2022. The findings of the policy coherence analysis carried out under this project can provide the basis for the development of the national programme, especially for the livestock sector section.

For the first time in Mongolia, the project trained ten researchers from the Mongolian University of Life Sciences (MULS) and RIAH in the use of the GLEAM-i model for the calculation and estimation of GHG emissions. The Agrometeorological Research Division of the Information and Research Institute of Meteorology, Hydrology and Environment (IRIME) under the National Agency of Meteorology and Environmental Monitoring is also committed to using GLEAM from 2022 for an additional indicator of GHG emissions by livestock population in the assessment of pasture carrying capacity, carried out annually in 1 500 monitoring sites located throughout the country.

Project sustainability will be enhanced by the strengthened alliances between MoFALI, MULS, RIAH, IRIME and non-governmental organizations during project implementation.

2. Gender equality

Women were a particular target group in this project. One third of the 23 households in the pilot sites that directly benefited from the project were female-headed and 13 of the 19 participants of the training of trainers on “Climate Smart Ruminant Production” were women, as were 60 percent of the engaged research teams from the Service Providers (MULS, RIAH and IRIME).

As the adopted CSL solutions were targeted at herder households, men and women in the three pilot sites benefited equitably from the project.

3. Environmental sustainability

The adopted CSL solutions in the pilot sites, as well as the evidence base generated under the project, were fully mainstreamed in terms of environmental sustainability.

4. Human Rights-based Approach (HRBA) – in particular Right to Food and Decent Work

Thanks to the installation of solar-powered wells, the beneficiary households now have a reliable source of water, enabling them not only to produce a regular supply of fodder for their livestock by irrigating forage plots, but also to satisfy the water requirements of people and livestock while ensuring food security, in particular for the herder community in the semi-desert zone.

5. Technological sustainability

The introduction of a solar-powered pumping system in the three pilot communities has increased energy efficiency and replaced diesel as the main energy source for pumping. The use of deep wells with renewable energy has reduced GHG emissions by 95 percent when compared to diesel pumps, using Life Cycle Assessment. The three beneficiary communities of the project can pursue the project activities without further technical assistance.

Although the Mongolian pastoral system possesses many traditional climate-adapted solutions, traditional good practices have faded as a result of the transition to a sedentary lifestyle and market uncertainty. The project contributed to highlighting such local good practices as pasture management in line with the four golden rules (conserve, restore, rest and use), the biothermal treatment of livestock manure and the maintenance of an optimal herd structure.

6. Economic sustainability

From the second year of fodder cultivation, the local governments of the pilot communities have allocated financial support from district development funds to enable beneficiaries to purchase seed to produce oat silage.

Thanks to the adopted CSL solutions by the project, the production and income of the beneficiary households have both increased. As official herder communities formed, each group created a community fund of MNT 1 million to ensure the maintenance of fenced forage plots with deep wells.



DOCUMENTS AND OUTREACH PRODUCTS

- ❑ **FAO. Introduction to Climate Smart Livestock Approaches.** *Agriculture tomorrow.* Newspaper article. June 2020.
- ❑ **FAO. Climate Smart Livestock Solutions.** *Agriculture tomorrow.* Newspaper article. October 2020.
- ❑ **Climate Smart Ruminant Production.** Reference book with nine training modules. FAO Mongolia, November 2021. 180 pp.
- ❑ **Agro-ecology School, Mongolian University of Life Sciences.** 2021. *Report of comprehensive assessment of the current state of the climate, pastures, soil, water resources, vegetation, greenhouse gas emissions from livestock population, and other anthropogenic factors that exacerbate desertification in the Dundgovi province.* November 2021. 380 pp.
- ❑ Piloting Climate Smart Livestock Approaches, MNB. Video. www.mnb.mn/archive/2019-10-07-14-00-00.
- ❑ **FAO. Livestock and climate change.** Video. November 2021. <https://bit.ly/3M6l43Q>.
- ❑ **FAO. Understanding Climate-Smart Agriculture/Livestock.** Video. November 2021. <https://bit.ly/3N6cZw5>.
- ❑ **FAO. Climate Smart Solutions on Grazing and Pasture Management.** Video. November 2021. <https://bit.ly/3lhQhFz>.
- ❑ **FAO. Climate smart Solutions: On herd management (breeding, feeding, and disease control).** Video. November 2021. <https://bit.ly/39ae4Eg>.
- ❑ **FAO. Climate smart Solutions: Livestock housing and manure management.** Video. November 2021. <https://bit.ly/39SoB7D>.

ACHIEVEMENT OF RESULTS - LOGICAL FRAMEWORK

Expected Impact	Contribute to the achievement of national food security and development goals through adopting Climate-Smart approaches to increase the productivity of dual purpose cattle, sheep and goats sustainably with enhanced resilience (adaptation) and reduction of GHG emissions (mitigation)		
Outcome	A favourable environment for an economically viable and competitive climate resilient livestock sector that is capable of providing safe and healthy food for the population, increase exports.		
	Indicator	<ul style="list-style-type: none"> – Number of extensive pastoral herding communities to adopt CSL approaches. – Number of semi-intensive dairy farming villages to adopt CSL approaches. 	
	Baseline	<ul style="list-style-type: none"> – 0 – 0 	
	End Target	<ul style="list-style-type: none"> – 2 – 1 	
	Comments and follow-up action to be taken	<p>The proposed activities and outputs were mostly achieved. The conclusions of the comprehensive review of the changing landscape in the livestock sector and the analysis of policy coherence carried out within the framework of the project were discussed at workshops on climate change, disaster risk reduction and livestock, and presented to the Ministry of Economic Development to consider relevant recommendations in the Ten-year Targeted Development Programmes in particular, in National Programmes for Adaptation and Mitigation of Climate Change and Transformation of Agri-Food Systems to Achieve Development Goals. To create a favourable policy framework that integrates policy objectives and investments, site-specific findings of the piloted interventions for adopting CSL solutions in three different livestock production systems need to be shared with diverse partners working in different sites and contexts of livestock production, climate change and food systems of Mongolia.</p>	
Output 1	A favourable legal, economic and institutional environment that, integrated with climate smart approaches, is applied to district, province and national livestock sector development plans		
	Indicators	Target	Achieved
	CSL approaches are reflected in the sectoral development plans.	4	Yes
Baseline	0		
Comments	<p>Agriculture is the second pillar of the Mongolian economy, with the livestock sector providing about 90 percent of total agricultural production. Over 90 percent of livestock production comes from the pastoral production system, but currently 65 percent of pastures are degraded to some extent. Because of weak cross-sectoral policy coherence, there are a few specific livestock-related technical documents that do not refer to climate issues in detail, and several climate-specific documents that lack details on CSL solutions as revealed by the comprehensive review of the changing landscape in the livestock sector and the analysis of policy coherence conducted within the framework of the project.</p>		
Activity 1.1	A comprehensive overview of the changing landscape of livestock production systems		
	Achieved	Yes	
	Comments	The findings of the analysis were presented and consulted at a number of stakeholder meetings on climate change, disaster risk reduction and livestock sector.	
Activity 1.2	Evidence generated and communicated effectively to influence policies and public/private-sector investment		
	Achieved	Yes	
	Comments	<p>A comprehensive assessment of the current state of the climate, pastures, soil, water resources, vegetation, greenhouse gas emissions from livestock population, and other anthropogenic factors that exacerbate desertification in the Dundgovi province, where desertification is more intense than in other provinces of the country, has made a significant contribution to expanding the evidence base. As a result of the assessment, 39 detailed technical recommendations were provided to 15 soums (districts) of the Dundgovi province to update their short and medium term environmental management plans taking into account CSL approaches.</p>	

Output 2	Economic return of livestock owned by small-scale herders and farmers is increased by using climate smart livestock production practices		
	Indicators	Target	Achieved
	Climate smart livestock production practices introduced in selected communities.	3	Yes
Baseline	0		
Comments	The project adopted CSL approaches in the three pilot livestock production systems. Apart from N ₂ O emissions, the project activities in the pilot sites led to a significant drop in GHG emissions (on average: -21 percent for CH ₄ , -21 percent for CO ₂ , and -15 percent for overall GHG emissions). Improved manure management is necessary to achieve sustainable agrifood systems, with better nutrient cycling and improved soil health, and a reduction in the need for expensive inputs, especially in the central (peri-urban) crop production zone with intensified and semi-intensified dairy and beef production systems.		
Activity 2.1	Community-based climate resilient livestock production practices promoted		
	Achieved	Yes	
	Comments	It is important to note that the project demonstrated the importance of engaging researchers to generate evidence-based data while promoting best practices in the field. The on-field research activities provided an opportunity for local researchers and service providers to conduct research in collaboration with farmers, and to demonstrate appropriate practices to the participant farmers to enable them to learn and adopt the technology introduced.	
Activity 2.2	Improved feeding pattern and nutrition practices of ruminants to reduce enteric fermentation		
	Achieved	Yes	
	Comments	Better animal husbandry techniques, improved feeding strategies, better dry season feeding, and improved pasture management with more productive herds have contributed to targeted reductions.	
Output 3	Enhanced employment opportunities for women and men in selected communities through capacity development for accessing markets for sustainably sourced livestock products		
	Indicators	Target	Achieved
	Number of herder communities whose capacity is strengthened through project activities.	3	Yes
Baseline	0		
Comments	The beneficiary small-scale farmers' group with a semi-intensive dairy farming system in a peri-urban area, on the basis of an agreement concluded with a dairy enterprise (Mon Fresh LLC), became eligible for a state subsidy for winter milk supplies, effective from 2020. The beneficiary herder group with a small ruminant production system in a semi-desert area sold 15 percent of its herd during the project to a meat processing company (Makh Market LLC), thereby improving economic turnover, while reducing pressure on pastures and GHG emissions. The selected herder group with pastoral cattle production system became able to supply milk to canteens along the main road to the eastern region in winter. This is because the group is located in the area alongside the road.		
Activity 3.1	Identify public-private-community partnerships for sustainably sourced, climate resilient livestock products		
	Achieved	Yes	
	Comments		
Activity 3.2	Establishment and training of Herder Producer Organizations		
	Achieved	Yes	
	Comments	Within the framework of the project, formal herder groups were established in all three pilot sites. Working closely with the Mongolian National Federation of Pasture User Groups, the group using the pastoral small ruminants production system was encouraged by the consultant to form a herder cooperative and provided with training in its establishment. In addition, based on the nine-module training manual on "Climate Smart Ruminant Production" developed as part of the project, herders of the three beneficiary communities were trained, while 19 local extension practitioners from five herder cooperatives of Zavkhan aimag's Provincial Association of Pasture Users' Group were trained as local catalysts for CSL practices.	
Activity 3.3	Generation and dissemination of knowledge products to support private-sector and herder engagement in climate-resilient and sustainable production in Mongolia		
	Achieved	Yes	
	Comments	In addition to the training manual on "Climate Smart Ruminant Production", in order to raise awareness among all stakeholders and, in particular, policy-makers, a mini-series of six educational videos was produced, with the following titles: i) Sustainable livestock for SDGs; ii) Livestock and Climate change; iii) Understanding Climate-Smart Agriculture/Livestock; iv) Climate smart Solutions on Grazing and Pasture management; v) Climate smart Solutions: On herd management (breeding, feeding and disease control) and vi) Climate smart Solutions: Livestock housing and Manure management.	

Partnerships and Outreach

For more information, please contact: Reporting@fao.org

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