

**Support for Locally Led Climate and Disaster Risk Resilience in Mongolia Global Facility for
Disaster Risk Resilience**

Policy Brief

Center for Policy Research

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ACRONYMS

ADB	Asian development bank
CPR	Center for Policy Research
DRR	<i>Disaster risk reduction</i>
EBRD	European Bank for Reconstruction and Development
GHG	Greenhouse gas emissions
GCF	Green Climate Fund
MED	Ministry of Economy and Development
MET	Ministry of Environment and Tourism
MNT	Mongolian national tugrik /currency/
MOF	Ministry of Finance
MOFALI	Ministry of Food, Agriculture and Light Industry
MRCS	Mongolian Red Cross Society
NAMEM	National Agency for Meteorology and Environmental Monitoring
NEMA	National Emergency Management Agency
NSO	National Statistics Office

1. Introduction

With an area of 1.565 million km and a population of 3.2 million, Mongolia is the most sparsely populated country in the world. It is surrounded by mountains and hills with severe continental climate with average monthly temperature dropping to minus 25 °C in winter months.

In 2022 the agricultural sector, overwhelmingly engaged in pastoral livestock production, accounted for 12.8 percent of GDP and 30 percent of total employment¹.

Mongolia is one of the countries most affected by climate change. The average annual temperature increased by 2.07C° between 1940 and 2013, 3 times higher than the world average². About 77 per cent of the country's area is affected by desertification and land degradation and 23 per cent is considered highly and very highly degraded.³ Drought is the strongest driver of risk in Mongolia which ranks as the 27th most exposed country in the world⁴. The last two decades have also been characterized by heavy snowfall and longer-lasting extreme winter weather (*dzud*) with a significant impact on agriculture and livestock herding. In a single year, such as 2010, a *dzud* has reportedly caused 30 per cent of loss of livestock.

These changes are especially palpable for local communities, whose livelihoods are dependent on sustainable pasturelands and livestock health. Livestock herding has long been a social safety net, for poorer Mongolians practice it as a kind of default livelihood, economically, at times when they cannot find other opportunities. Without concerted disaster risk reduction efforts and support for communities to adapt, Mongolia's poorest communities will continue experiencing significant damage and loss.⁵

The World Bank has supported the LDF and its system of performance-based local financing through the Sustainable Livelihoods Project (SLP) series. The project has supported a number of community-based initiatives and local development solutions aimed at promoting climate and disaster resilience and adaptation. The project has supported multiple local initiatives that contribute to local climate adaptation, yet to date, there is no mainstream mechanism for climate or disaster risk screening, performance rewards, or evaluation based on climate/disaster resilience impact in the SLP or the broader LDF operations.

The government has made commitments on both climate change mitigation and adaptation fronts to ensure a greener and more resilient development path. In 2020 Mongolia submitted its updated Nationally Determined Contributions (NDCs) to the Paris Climate Agreement, in which it committed to reduce GHG emissions by 22.7 percent by 2030.

This assignment aims to assess the experience of the current LDF and its potential to integrate local participatory climate and disaster risk assessments as part of local project prioritization. Moreover, it assesses key climate priorities requiring local government action, and how these could be supported via additional criteria and capacity building integrated into the LDF.

¹ NSO, 2023

² National Program to Mitigate Disaster Risks in the Participation of Communities", Government Resolution #303 dated 20 July 2015

³ The Government of Mongolia. 2018. The Third national communication of Mongolia.

⁴ World Bank, ADB. 2021. Mongolia: Climate Risk Country Profile.

⁵ World Bank, ADB. 2021. Mongolia: Climate Risk Country Risk Profile.

2. Government priorities, key policies, and legal environment

Mongolia's long-term development policy 'Vision-2050' has set the objectives to strengthen adaptation and resilience to climate change, reduce potential risks and support and develop a national green financing mechanism based on public-private partnership⁶. Its agricultural sector objective prioritized environmentally friendly, adaptable to climate change, resilient, highly productive and sustainable development and aimed at transforming the sector from quantity to productivity and quality by 2030.

The new economic recovery policy also aims to implement green projects that are environmentally friendly, emit less greenhouse gas, save energy and clean water, and provide soft loans and incentives for the purchase of goods. In addition, the policy focuses on introducing a financing system, loans, and incentives to promote green development.⁷

Last updated in 2019, Mongolia's Nationally Determined Contribution (NDC) has set the target to reduce GHG by 16.89 million tons of CO₂e (22.7%)⁸. The agriculture sector's GHG reduction target was set to reduce GHG emissions by 5.28 million tons of CO₂e, entirely by reducing the herd size from 66.5 million in 2018 to 53.7 million in 2030⁹.

In 2019 Mongolia launched the preparation of its National Adaptation Plan (NAP). The plan is being still finalized and the draft version (2023) highlights, among others pastureland use agreements to address overgrazing, an early warning system for multi-hazards, improving supplementary feed supply, livestock commercialization through increased sales of young animals and compartment zones, optimizing agricultural subsidies considering sustainable development criteria, frost and heat resistant crop varieties and building a sustainable agricultural extension system.

The Mongol Livestock Program's target was to reduce the herd size from 43.3 m in 2008 to 36.5 m in 2021. Likewise, the MOFALI's Action plan for the Mongolian Agenda for Sustainable Livestock set targets to reduce the livestock number by 5 million sheep units from 2017 to 2020¹⁰

However, the implementation of these targets proved to be not easy. The livestock number has increased from 32.7 million in 2010 to 71.1 million in 2022 making the sector #1 source GHG emissions.

The harmful effects of the herders' behaviour for pursuing the herd size increase are not limited to GHG, it makes all potential climate change adaptation strategies ineffective – ruined *otor* reserve pastures used in emergencies, drastically reduced supplementary feed supply, severe feed deficiency made animals vulnerable to climate change and disaster risks. In addition, severe overgrazing poses a key threat to sustainable livestock development, food security and rural poverty alleviation. The situation is aggravated by the current organization of livestock herding fragmented into small household economies. A low-density of population coupled with high transaction costs due to fragmentation is a major barrier for both input/service delivery and product collection/marketing and the poor are hit hardest.

The current herders' behavior is dictated by the existing incentive structures. Herders use pastures free of charge without any accountability for overgrazing and degradation. As herders' products are not graded

⁶ Vision 2050, Mongolia's long-term development policy, 2020

⁷ New economic recovery policy, Action Plan, 2021

⁸ NDC Mongolia, Government resolution #407 dated 19 November 2019

⁹ GGGI, 2019. Final Report, Development of sector analysis and INDC revision of Mongolia – Agriculture Sector, A.Enkh-Amgalan

¹⁰ MOFALI, 2018. Sustainable Livestock Development Action Plan

at farmgate there are no quality differentiated prices which serves as a key incentive for herders not to invest in quality improvements but to keep increasing the herd size. Herders are not interested in joining cooperatives making a major barrier for them to improve bargaining power in marketing their products and gain scale economies in aggregation, grading, transportation, and storage.

The effective Land Law provisions for soum Governors to establish pastureland use agreements (PUA) on winter-spring pastures only based on herder groups' applications fall short of ensuring sustainable use of pastureland. As a result, the introduction of pastureland use agreements is limited to only pilots by donor projects. At the same time, non-sustainable pastureland management practices are commonplace making herders vulnerable to increased land degradation and climate change. Moreover, it was difficult to enforce PUAs established under donor-supported programs for herders who see their neighbours keep increasing the herd size, which strongly suggests that PUAs are not effective until they cover all herders.

2019 amendment to the VAT attempted to stimulate the supply of agricultural raw materials to national processors by exempting VAT for raw materials purchased from producers like herders and vegetable growers. However, the regulation was not conducive for cooperatives as the VAT exemption of raw materials from individuals was a strong stimulus for them not to join cooperatives.

In May 2021, the Parliament approved a new law on cooperatives. To reconcile with the cooperative law principles the VAT law was amended to include cooperatives in the same exemption introduced in the 2019 amendment. This reform put individuals and cooperatives on an equal footing and selling through cooperatives no longer puts a herder at a disadvantage. However, the reform fell short of making cooperatives competitive against informal traders of agricultural raw materials called 'changers' and encouraging herders to join cooperatives as equal footing gives no advantage to cooperatives.

Mongolia introduced the Livestock Head Tax in 2020. The livestock head tax can be an effective tool to provide an incentive to balance inventories with carrying capacity.¹¹ Given the decentralization of decision-making in the Livestock Head Tax Law, there is a need for guidance in setting taxation rates and allocating revenues from the Ministry of Finance and the Ministry of Agriculture and Light Industry.

Key challenges faced with the implementation of the government climate change and disaster risk policies include lack of finances, technical expertise and weak institutional settings especially at the local government levels. As a result, most government policy priorities remain on paper and are not translated into actions at localities.

The government-funded support and subsidies also play an important role in shaping the mentality to prefer total production over product quality at the expense of environmental degradation. The skewed nature of budgetary spending toward direct producer support shows a focus on short-run outcomes and is not linked to any sustainability metrics and thus does not promote any of the Government's environmental or sustainability objectives.

¹¹ Article 60.2.8 of the integrated budget law indicates that livestock head tax revenues are to be spent on "improving pasture management, water supply to pasture and crop land, protecting animal health, preventing animal contagious diseases, improving animal productivity, protecting against animal criminal acts (theft) and disasters, increasing precipitation, cropping animal fodder, establishing fodder reserve, protecting environment, fighting against insects and rodents, training and promotional activities for herders."

3. Lessons learned from pilot projects and programs

Despite difficulties the Government faces in implementing its ambitious tasks to address climate change and disaster risk challenges, there are piloted best practices undertaken by donor projects in Mongolia.

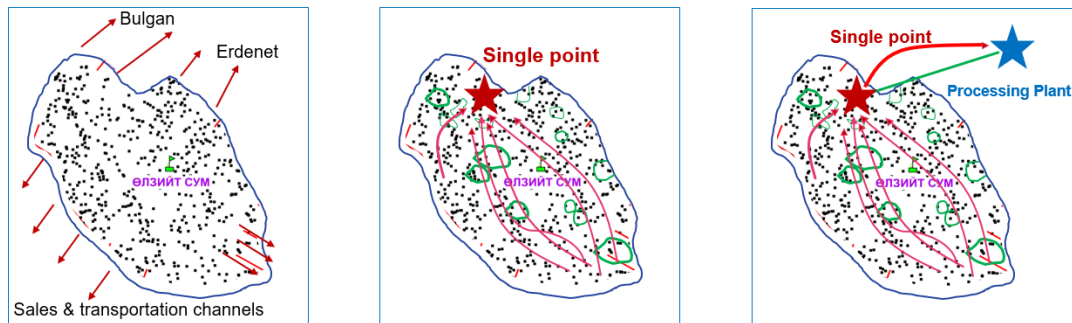
In 2019-2020, the UNDP ENSURE project piloted activities to change the herders' behaviour through a package of awareness-building and incentive mechanisms. In 13 soums of Arkhangai, Bayankhongor, Khovd, Zavkhan aimags in 2019-2021, the project piloted (i) a training package showing benefits and ways to improve livestock incomes through increased livestock productivity and commercialization of animal sales; (ii) pastureland use agreements (PUA) between herder groups and district governors to build herders' formal commitment to reduce the herd size to optimum levels; (iii) payment for ecosystem services (PES) in the form of cash bonuses for livestock sold/consumed for meat. The model covered 225 herder groups covering around 1300 herder households. The pilot resulted in the herd size decrease for two consecutive years in 2020-2021 by 23.4% in total among project herders against 13.3% among non-project herders in the same soums. As project and non-project herders experienced the same weather and socio-economic conditions in 2020-2021, the huge 10.1 percentage point difference can be safely attributed to the project. The herd size reduction led to a reduction of GHG from livestock by 29.2 thousand tons of CO₂ equivalents estimated as a difference between project and non-project herders.

In 2019-2022, EBRD and ADB projects piloted similar incentive packages with added support to animal sales through a single-point model (See **Figure 1**). The activities in single-point model stages mutually support each other. The establishment of PUAs builds formal commitment on the herders' side to reconcile livestock numbers with pasture carrying capacity, thus increasing livestock sales. In other words, improved livestock sales will assist herders in fulfilling their PUA obligations to reduce the herd size to optimum levels. The improved quality of livestock product examination and certification of raw materials allows processors to save processing costs as well as to increase the prices of end products. This in turn creates an opportunity for processors to offer better prices to herders for quality raw materials.

The project results include the herd size reduction among project herder households was 13.1% in 2019 and 16.2% in 2020, direct sales of livestock and cashmere between herders and processors with price premium for quality and cost savings from bulk transportation of marketed products.

In 2022, the ENSURE project has also piloted lamb fattening to test the feasibility of Mongolian lamb reaching slaughter weight. Implemented in the Bayantasgaan soum, Bayankhongor aimag and the Ulziit soum, Arkhangai aimag ewes were fed for 45 days to improve milk supply for lamb and reduce walking on spring poor pastures that exhausted both ewes and accompanying lamb. The pilot resulted in lamb reaching up to 50 kg of live weight, the live weight of 3-4 year-old sheep. This provided a potentially feasible way to sell lamb, thus significantly reducing the herd size.

Given the very high demand from herders for soft loans, herders' green loans with conditions to reduce the herd size proved to be a powerful incentive mechanism. In 2021 the KfW-funded project has piloted such loans in 5 soums of Arkhangai, Zavkhan, Uvurkhngai, and Khuvsgul aimags. 3-year soft loans with an annual interest rate of 7.5% were issued to 166 herder households resulting in a herd size decrease of 8.8-17.1% against a 5% task, while for the total of soums, the herd size increased by 2.1-7.2%.



Current situation :

- With no PUAs, uncontrolled herd size growth decreases pasture & livestock productivity
- No grading causes no price differentiation, no interest in investing in quality
- No way to enjoy bargaining power and scale economies in product sales and transportation
- Weak credibility and traceability of quality and origin certification

PUA and single point arrangement

- Under PUA herders use pastures responsibly in compatibility with carrying capacity
- Herders join marketing cooperatives
- Livestock & raw materials are collected at single point, graded and certified for origin and quality
- Single point is jointly organized by soum government, cooperative and processor through PPCP

Direct sales to processor:

- Promote 'green' and traceable products to buyers/processors (perhaps through ACE)
- Sell directly to processor at a price with quality premium
- Support the entire model by local development policies and green finance

PUA- pastureland use agreement
ACE- Agricultural commodity exchange
PPCP-public-private-community partnership

Figure 1 Package of incentive mechanisms to shift from quantity to quality

In 2017 the Mongolian Red Cross Society piloted ways to reduce the risks of highly vulnerable herder households from dzud using the NAMEM-produced dzud risk map. The project selected 2,000 of the most vulnerable herder households in high risk aimags and given them cash grants of 100 US dollars and animal care kits comprising essential medical and feed supplies before the winter conditions reached their peak. The results showed that a majority of herders used the cash support to buy animal feed; a 50% reduction in the mortality of horses; survival rates of goats and sheep also improved significantly; there was a reduction in existing indebtedness among targeted households.

The SDC-supported Green Gold project was one of the longest and most comprehensive interventions in the area of livestock development in Mongolia (From the mid-2000s to 2022). Since 2006, a network of over 1,300 pasture user groups (PUG) representing more than 35,000 herder households has grown up over large areas of the country. Some 840 pastureland use agreements have been signed. This has brought the problem of overgrazing to the attention of the herders and authorities, and the jointly agreed rules mean there are also far fewer conflicts among the nomads. The quality of the livestock products and their marketing has also improved. Many herders started combing their yak and camel wool using new tools thanks to the training provided by the project staff. The project has also introduced a science-based rangeland assessment and monitoring system.

Since 2021 the Sustainable Resilient Ecosystem and Agriculture Management in Mongolia (STREAM) project has been implemented in three soums of Selenge aimag and three soums of Khentii aimag (2021-2024). STREAM aims to increase the capacity of Mongolian communities to implement innovative and sustainable long-term landscape management to address food system challenges and climate stresses.

Piloted PUAs, a single point sales model and herder green loans can be scaled up in Mongolia with funding sources and intense capacity building for local stakeholders. However, a change in the legal environment, namely, the LDF rules is required to scale up a PES scheme.

4. LDF experience (findings from portfolio review and qualitative research)

The Mongolia Local Development Fund (LDF) was established with the purpose of channelling funds directly to local governments to support local development, ensuring balanced regional development and improving local living conditions and services for rural populations. Alongside the LDF, a performance-based grant is annually awarded to soums depending on their performance on a set of criteria measured by an annual performance assessment.

The World Bank has supported the LDF and its system of performance-based local financing through the Sustainable Livelihoods Project (SLP) series. The project has supported a number of community-based initiatives and local development solutions aimed at promoting climate and disaster resilience and adaptation.

The LDF portfolio review was carried out based on the data from the LDF MIS system as well as qualitative research in 8 selected soums from 4 aimags. LDF-funded projects in 2019-2022 were categorized into the total and those areas related to the agricultural climate and disaster resilience including those specified in article 60.2.8 of the Budget Law.

The Local Development Fund (LDF) operates according to the approved LDF rules and (i) fulfils well its purpose to channel funds directly to local governments to support local development, ensure balanced regional development and improve local living conditions and services for rural populations' (ii) provides a performance-based mechanism to ensure that local level investments contribute to a longer-term vision of resilience and climate adaptation efforts.

The total number of LDF-funded projects ranged from 54 to 103 per year and those related to the agricultural climate and disaster resilience ranged 4-21 or 7.4-20.4% in the total. In terms of the project value, the LDF investment ranged around MNT 86.4-268 million per year per soum, while the value of the agricultural climate and disaster resilience investments ranged around MNT 9.4-40.1 or 8.8-15% of the total investments.

Building animal dipping baths for parasite treatment, improving pasture water supply, protecting hayfields and springs by fencing, establishing soum fodder reserves and improving animal breeds were the most common investments in the soums directed at disaster and climate resilience building. While these investments make significant contributions to building soum climate and disaster resilience, many important activities are underfunded and not funded. As a result, the implementation of The Livestock Head Tax (LHT) introduced in 2021 to provide investments, as a part of LDF, specifically for supporting disaster and climate resilience activities in 12 directions as specified by article 60.2.8 of the Budget Law is insufficient.

The key problem with the policy and regulations is that both the Budget Law article and LDF rules approved by the Ministry of Finance have not specified eligible activities that can be financed under 12 directions. This causes serious uncertainties around the planning, implementation and monitoring of LHT spending in general and prevents LHT spending from focusing on addressing key problems such as overgrazing and declining livestock productivity. The investments in these priority areas of disaster and climate resilience building are non-existent or very little all over Mongolia except for small pilot initiatives by donor projects.

People especially complain about the government's failure to address overgrazing and regulate stocking densities including transboundary migrations. "The main factor affecting the degradation of pastures is the large number of horses coming from outside. Due to the increase in the number of horses, local people have

no place to graze their livestock. A lot of pastures are affected. Severe overgrazing makes livestock not get sufficient body condition to be sold. There is no place to build new winter and spring camps”¹².

The key problem with the funding is that the proposals herders want in disaster and climate resilience building are mostly private or club goods but not public goods. As a result, they have no chance of being supported by other people or ranked high to get sufficient votes for LDF funding. In other words, the current regulations are insufficient for LHT funding to translate into desired climate and disaster resilience investments.

“Herders of the rural baghs do not vote for the work to be done in soum center because they do not much care about the development that is being done in soum, and the residents of the soum center also do not support the proposals from herders because they do not care about the work related to the rural herders”¹³

Most herders perceive that LDF investments focus on soum center activities like schools and kindergartens. Herders feel that they don't get what they need to address challenges in livestock herding. Although proposals are collected, they are not implemented after ranking, so they lose interest in LDF operations.

The proposed potential activities eligible for LDF funding for building climate and disaster resilience and performance indicators to evaluate their implementation were supported by key stakeholders.

Local officials who understand well the overgrazing problem showed especially high interest and support for the proposed activities and performance indicators.

Most herders view that it is a very right thing to spend the tax money back to them. The proposal was supported in the sense that it makes sure that every taxpayer equally benefits from the projects based on taxpayers' real needs and is accessible to them. The proposal was also believed to improve herders' participation in LDF activities as it becomes certain that their proposals will be funded and implemented.

The MOFALI has expressed clear support that the proposed activities and indicators need to be promoted. The MOFALI's official letter to the Minister of Finance requested that the LDF rules be updated to separate livestock head tax revenues from other revenues and that eligible activities for spending LHT revenues be clearly specified.

The LDF's initial purpose and design to fund public good nature works and services are well established and are contradictory to the proposed eligible activities that are club and private goods. This suggests that good training is required for local officials to introduce the proposed activities and performance indicators, which should also address concerns that the workload will increase with the introduction of proposed activities and performance indicators.

Thus, building locally-led climate and disaster risk resilience in Mongolia requires certain adjustments to the existing legal environment and intense awareness and capacity-building activities.

Although an increasing number of politicians and herders understand that the existing dominant economic behaviour of herders has to change in order to stop pastureland overgrazing and degradation as the key challenge for building climate change and disaster risk resilience in Mongolia, it may still persist for years if the Government does not take resolute actions to lead this change.

¹² FGD among herders, Bayantumen soum, Dornod aimag

¹³ FGD among soum officials, Bayantumen soum, Dornod aimag

5. Recommendations – specifying who needs to take action

These recommendations are designed to scale up feasible models piloted under donor projects for building climate change and disaster risk resilience in rural Mongolia.

It is highly recommended that the tested innovative solutions such as PUAs, PES, and single point model to address severe overgrazing be further promoted using the LDF platform to best contribute to local government's efforts to build climate and disaster resilience. The recommendation details are discussed in the next section.

The effective Land Law articles for soum Governors to establish pastureland use agreements on winter-spring pastures only based on herder groups' applications fall short in ensuring sustainable use of pastureland. As a result, the introduction of pastureland use agreements is limited to only pilots by donor projects. The lack of economic incentives preventing herders from overgrazing contributes to the low introduction and enforcement of pastureland use agreements.

Therefore it is recommended that (i) the Land Law be amended to make sure soum Governors establish PUAs on a mandatory basis for four seasonal pastures covering all herders; (ii) MOFALI takes a lead in cooperation with the newly established land agency under PM to implement the Land Law amendments mobilizing public and donor resources. The ongoing amendments to the Land Law that already incorporate the above recommendation provide a good opportunity for the desired change¹⁴.

The LHT opened opportunities for improving locally-led climate and disaster risk resilience. However, the current LDF rules fall short of providing clear guidance on channelling LHT revenues for climate and disaster risk resilience investments including economic incentives to enforce PUAs.

Therefore, it is recommended that MOFALI actively cooperate with MOF, MED, NEMA, MET, the Cabinet Secretariat and relevant donor agencies in:

- (i) changing the LDF rules to incorporate the proposed eligible activities under each of the 12 directions specified in the Budget Law article 60.2.8 and performance indicators to evaluate their implementation
- (ii) organizing capacity building activities for local stakeholders mobilizing public and donor resources on how the proposed activities and performance indicators can be introduced, the roles and benefits they can play and gain;
- (iii) piloting the updated LDF rules by a small-scale project in selected soums to test the feasibility of the proposed activities and performance indicators and gain lessons for improvement
- (iv) guiding the replication of the updated LDF rules nationwide

The proposed performance indicators in Appendix 1 are expected to leverage soum Governors to fill 'gaps' in investments urgently required for building climate and disaster risk resilience in rural Mongolia. The proposed eligible activities in Appendix 2 are expected to remove uncertainties around what should be funded from LHT revenue and channel its spending on what herders exactly need for building climate and disaster risk resilience.

Enhanced cooperation among herders as well as value chain participants is a clear direction for improving climate and disaster risk resilience. The tested single-point model for collection, grading, quality examination/certification and sales of livestock and livestock raw materials in Figure 1 provides a promising solution to promote such cooperation. However, the key legal barrier to introducing and scaling

¹⁴ The Parliament Resolution #76 dated 7 July 2023 approved the Parliament 2023 autumn session agenda. The agenda includes amendments to the Land Law and associated legislation as an item number 9

up this model is the existing VAT law, which exempted VAT for raw materials purchased from herders and vegetable growers, thus providing a strong stimulus for them not to join cooperatives.

Therefore, it is recommended that the VAT law article 14.1.4 that provides the above-mentioned exemption be cancelled while keeping the same exemption (14.2) for herder cooperatives. This will make the most drastic reform that will:

- (i) stop sales of livestock and livestock raw materials by individuals (changers and herders);
- (ii) directly connect herder cooperatives with processors and make the latter's preference for quality raw materials reach herders by price premiums instead of being eroded by informal changers who currently stay between them and profit from keeping herders' prices as low as possible ignoring their product quality;
- (iii) make informal changers either join/establish cooperatives or become agents of processors to stay in the business;
- (iv) sharply increase Herder Cooperative's business and finance, and improve its governance by attracting capable managers and accountants- the most desired change in strengthening herder cooperatives.

The government-funded support and subsidies also play an important role in shaping the mentality to prefer total production over product quality at the expense of environmental degradation. The skewed nature of budgetary spending toward direct producer support shows a focus on short-run outcomes and is not linked to any sustainability metrics and thus does not promote any of the Government's environmental or sustainability objectives.

The skewed nature of budgetary spending toward direct producer support shows that Government policies are focused on short-run outcomes. These transfers are a good mechanism to incentivize increased production by either lowering the cost of production or providing payments linked to the level of output. However, these subsidies are not linked to any sustainability metrics and do not promote any of the Government's environmental or sustainability objectives¹⁵.

Therefore, it is recommended that

- (i) inequitable and unhelpful subsidies be removed to improve the competitiveness and efficiency of the sector
- (ii) less distortive subsidy instruments linked to sustainability, productivity, and quality indicators such as PES be gradually introduced

The climate risks will increase in the future. Compared to the current situation, the share of low-risk areas will decrease significantly in 2030 and 2050, while the share of high-risk areas will increase. For example, in 2050, the area with the lowest risk will decrease from 27.3% to 18.5%, the area with low risk will decrease from 35.6% to 10.1%, while the share of high-risk areas will increase from 6.7% to 34.3%, and the share of very high-risk areas will increase from 0.05% to 11.5%¹⁶.

¹⁵ World Bank, 2022. Green Transformation of the Mongolian Agri-Food System

¹⁶ Climate risks were estimated for each soum for 2020, 2030, 2050 using climate risk indexes developed in 2023 by a team of researchers from NAMEM and CPR under the GCF-UNDP funded ADAPT project.

Therefore, it is recommended that climate risk indexes (CRI) be used by aimags and soums in optimizing resources used in their disaster prevention and risk reduction plans so that the most risky and vulnerable regions, aimags and soums are allocated fair share of public, private and international funding¹⁷.

¹⁷ Aimags and soums should develop disaster prevention and risk reduction plans according to the "Instructions for the Development of Disaster Protection Plans for Aimags, Capital City, Soums and Districts" approved by the Deputy Prime Minister's Resolution #120, 2018

Appendix 1 The proposed indicators to assess the performance of LDF projects in the climate and disaster resilience, by key activities:

1. Improve pasture management
 - 1.1. Share of pastures used under PUA in the total soum pasture
 - 1.2. Share of herders fulfilling the task to reconcile animal numbers with pasture carrying capacity
 - 1.3. Share of *otor* reserve pastures in the total soum pasture
2. Improve water supply for pastures and feed crops
 - 2.1. Share of pastures with water supplied in the total soum pasture
3. Protection of animal health
 - 3.1. Share of facilities, and areas disinfected in the total number
 - 3.2. Share of treated carcasses of dead animals in pastures in the total number of carcasses
 - 3.3. Rate of curing non-infectious diseases and various poisonings
4. Prevention of infectious diseases
 - 4.1. No indicator suggested/required
5. Improve the quality of livestock
 - 5.1. Share of breeding female and male animals that meet quality standards in the total number of breeding female and male animals
 - 5.2. Share of female animals engaged in breeding with an adequate ratio of male-female animals in the total number of breeding female animals
6. Disaster risk reduction
 - 6.1. Share of herder households covered by livestock insurance in the total number of herder households
 - 6.2. Share of herder households invested in small-scale forage seeding nearby winter-spring shelters and tree planting behind animal fences and sheds to protect against strong winds and dust storms
 - 6.3. Early warning -identify during the fieldwork if any quantitative and feasible are available
 - 6.4. Other actions and investments related to better communication and information systems
7. Increase the amount of precipitation
 - 7.1. No indicator suggested/required
8. Cultivation of fodder plants and creation of fodder reserves
 - 8.1. Supplementary feed supply-kg of feed unit per sheep unit
 - 8.2. Amount allocated to emergency fodder reserve and put in a separate transparent account to be used in emergencies /flexible funding principle/
9. Environmental protection
 - 9.1. Share of protected sources of springs and streams in the total number
 - 9.2. Volume of hay and fodder provided for the wild herbivores
 - 9.3. Number of recovered wildlife
10. Control of pasture insects and rodents
 - 10.1. No indicator suggested/required

11. Training and awareness building for herders

Share of herder households covered by capacity building activities by professional training/extension service providers in the above 10 fields

Appendix 2 Potential activities eligible for LDF funding on the agricultural climate and disaster resilience

1. improve pasture management:
 - 1.1. Establish and enforce pastureland use agreement /PUA/ with herder groups to promote sustainable use of pastures with clear responsibilities, among others, for reconciling animal numbers with the carrying capacity of pastures (costs associated with training, identifying, registering and mapping of land use boundaries, consultations with neighbours)
 - 1.2. Estimate annually the grass yield and carrying capacity of pastures in order to evaluate the PUA implementation by herder groups
 - 1.3. Support members of herder groups in implementing PUA by facilitating/simulating livestock sales
 - 1.4. Establish and regulate the use of otor reserve pastures to be used in emergencies
 - 1.5. Promote pasture rotations and resting

2. Improve water supply for pastures and feed crops
 - 2.1. Building and repairing deep wells
 - 2.2. Building and repairing hand wells
 - 2.3. Building and repairing water reservoirs
 - 2.4. Protecting the sources of springs and streams
 - 2.5. Support for irrigated cultivation of fodder plants

3. Protection of animal health
 - 3.1. Simple infectious and parasitic diseases: service fees for the disinfection of fences, sheds, houses, vehicles, special work clothes, and water points in pastures where outbreaks have occurred, based on the contract with private veterinary service providers
 - 3.2. Disinfecting carcasses of dead animals in pastures- transportation/fuel costs associated with the participation in cleaning & disinfecting
 - 3.3. Diagnosis and treatment of non-infectious diseases and various poisonings - service fees based on the contract with private veterinary service providers

4. Prevention of infectious diseases
 - 4.1. Diagnosis and preventive measures for common contagious (excluding highly contagious diseases such as FMD, PPR, and smallpox which receive funding from the state budget) and zoonotic diseases (brucellosis, tuberculosis, anthrax) - service fees based on the contract with private veterinary service providers

12. Improve the quality of livestock
 - 12.1. Grading and classification of livestock for breeding—service fees based on the contract with private breeding service providers
 - 12.2. Organization of selection and breeding based on grading and classification- service fees based on the contract with private breeding service providers
 - 12.3. Purchase of good quality (pure, hybrid, crossbred) bulls, rams, and goats and their frozen semen
 - 12.4. Measuring and recording animal productivity indicators (live weight of cattle, sheep, goats, goat cashmere, sheep wool, camel and cow milk) from a representative sample of the soum livestock.

13. Disaster risk reduction
 - 13.1. Livestock risk insurance premium costs

- 13.2. Plant trees behind animal fences and sheds to protect against strong winds and dust storms
- 13.3. Repair of the winter and spring shelters to protect animals
- 14. Increase the amount of precipitation
 - 14.1. Payments for induced rains through influencing clouds
- 15. Cultivation of fodder plants and creation of fodder reserves
 - 15.1. Purchase of seeds for planting fodder on manure around winter/spring shelters
 - 15.2. Preparation of supplementary feed reserves (self-preparation and purchase from the market)
- 16. Environmental protection
 - 16.1. Protect the source springs and streams
 - 16.2. Provide fodder for wild animals
 - 16.3. Recovery of wildlife such as marmots
 - 16.4. Community volunteer rangers' expenses
- 17. Control of pasture insects and rodents
 - 17.1. Control of pasture rodents and insects in an environmentally friendly way
- 18. Training and awareness building for herders
 - 18.1. Service fees to professional training/extension service providers in all the above 10 fields