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### **Mobility at risk: Sustaining the Mongolian steppe ecosystem – developing a vision**

**Stakeholder involvement and identification of drivers  
and pathways towards sustainable development**



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# Mobility at risk: Sustaining the Mongolian steppe ecosystem – developing a vision

**Stakeholder involvement and identification of drivers  
and pathways towards sustainable development**

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## Executive summary

“MORE STEP – Mobility at risk: Sustaining the Mongolian Steppe Ecosystem” is a collaborative and transdisciplinary research project conducted by Mongolian and German partners and funded by the German Federal Ministry of Education and Research (BMBF 01LC1820E). The main aim is to bring social and ecological sciences together to identify societal drivers that can lead to an ecological tipping point in the Mongolian steppe ecosystem.

In 2017, an initial stakeholder meeting was conducted in Ulaanbaatar as part of MORE STEP’S pre-phase to identify the project’s stakeholders (Mehring et al. 2018). The results of this initial stakeholder meeting helped shaping the stakeholders’ engagement for the main phase of MORE STEP for which three stakeholder workshops are planned throughout the project period 2019–2022. In August 2019, the first stakeholder workshop as part of the main phase was held in Ulaanbaatar, Mongolia to develop a vision of sustainable development trajectories and to identify drivers for scenario building. The 52 participants represented diverse stakeholder groups such as the national government, national government agencies, local government (*aimag* and *soum*), foreign government agencies, interest groups and unions, international organizations and institutes, national and bilateral organisations, and academia. The workshop was about gathering insights on policy instruments and their impacts as well as main on trajectories of societal transformation.

In the session on policy instruments, the three thematic working groups “Herders’ Mobility”, “Sustainable Livelihoods”, and “Conservation of Wildlife” dealt with the effectiveness of international, national and regional policies and policy instruments. All groups were actively engaged in open and critical discussions. The groups “Herders’ Mobility” and “Sustainable Livelihoods” noted that policies do not reach herders or are not implemented in practice often due to the lack of policy implementation mechanisms, poor monitoring of their implementation and lack of funding. Both groups critically discussed the need to ensure the herders’ access to pasture and water, increased livestock productivity, improved pasture use planning at the community level, as well as to traditional knowledge preservation, and knowledge transfer to herders. The “Conservation of Wildlife” group acknowledged the strong impact of policies on wildlife conservation in protected areas under the National Biodiversity Conservation Program (2015–2025) and noted a successful implementation of the United Nations Convention to Combat Desertification (UNCCD) in Sukhbaatar *aimag*. However, the group also highlighted key challenges and policy gaps related to abundance of wildlife, land degradation, and tensions between wildlife conservation and land use.

In the session on main pathways of societal transformation, participants identified drivers of a desirable (positive) future and of an unfavourable (negative) future. The main drivers for a positive future are comprehensive legislation and good governance, increased capacity building, and reformed national education. In addition, improved economic opportunities, effective regulation on mining, and improved air quality and

public health were also identified as drivers of a positive future. The main drivers of a negative future are global pressures and local misuse of natural resources. Other drivers of a negative future are political crises such as loss of justice and democracy, societal change such as deterioration of the health system and increasing poverty and inequality, as well as economic crises due to high import dependency and low competitiveness caused by declining quality of agricultural products.

The results of both sessions underlined the importance of effective policy and accessible capacity building and education as major contributors to sustainable development in Mongolia. A prerequisite for these is adequate funding for implementation. These outcomes provide a basis for developing a vision of sustainable transformation pathways for Mongolia. The next stakeholder workshop will consider these results by conducting an assessment and valuation of scenarios of sustainable livelihoods in the Mongolian Steppe Ecosystem.

## Хураангуй

ХБНГУ-ын Боловсрол, судалгааны яамны дэмжлэгтэйгээр хэрэгжүүлж буй “Нүүдэл, шилжилт хөдөлгөөний эрсдэлд: Монгол орны тал хээрийн экосистемийн тогтвортой байдлыг хангах-МОРСТЭП” төсөл нь Монгол болон Герман судлаачдын хамтын ажиллагааны үр дүнд бий болсон судалгааны төсөл юм (дугаар: BMBF 01LC1820E). Судалгааны үндсэн зорилго нь нийгэм, экологийн шинжлэх ухааны уулзварт Монгол орны тал хээрийн экосистем дэх экологийн шилжилтийн утгад хүргэж буй нийгмийн хүчин зүйлсийг тодорхойлоход оршино.

Төсөл боловсруулах бэлтгэл үе шатанд буюу 2017 онд Улаанбаатар хотноо МОРСТЭП төслийн оролцогч талуудын анхны уулзалтыг зохион байгуулсан. Тус уулзалтын үр дүнд МОРСТЭП төсөл хэрэгжих хугацаанд талуудын оролцоог хэрхэн хангах асуудлыг тодорхойлсон бөгөөд 2019-2022 онд нийт 3 удаагийн талуудын уулзалтыг зохион байгуулахаар төлөвлөв. Төслийн хэрэгжилтийн эхний үе шатанд, 2019 оны 8 дугаар сард талуудын анхны уулзалтыг зохион байгуулсан бөгөөд тус уулзалтаар тогтвортой хөгжлийн цаашдын хандлага, үзэл баримтлалыг тодорхойлох, загварт ашиглах хувилбарууд, тэдгээрт нөлөөлөх хүчин зүйлсийг тодорхойлох асуудлыг авч хэлэлцсэн болно. Тус хэлэлцүүлэгт засгийн газар, агентлаг, орон нутгийн (аймаг, сумын) засаг даргын тамгын газар, зарим улсын төрийн байгууллага, сонирхлын бүлгүүд, мэргэжлийн холбоод, олон улсын байгууллагууд, их, дээд сургуулийн төлөөлөл бүхий 52 хүн оролцсон юм. Мөн бодлогын арга хэрэгсэл, түүний үзүүлэх нөлөө, нийгмийн өөрчлөлтийн гол арга замыг тодорхойлох зэрэг асуудлыг тус хэлэлцүүлгээр мөн авч үзсэн.

Бодлогын арга хэрэгслийн талаарх хэлэлцүүлгийн үеэр оролцогчдыг “Малчдын нүүдэл”, “Тогтвортой амьжиргаа”, “Зэрлэг амьтан хамгаалал” гэсэн гурван бүлэгт хувааж олон улсын, үндэсний болон бүс нутгийн түвшний бодлого, бодлогын арга хэрэгслийн үр дүнгийн талаар авч хэлэлцсэн болно. Бүлэг тус бүр тус хэлэлцүүлэгт идэвх, санаачлага гарган оролцсоныг энд онцлох нь зүйтэй. “Малчдын нүүдэл” болон “Тогтвортой амьжиргаа” бүлгүүд дараах зүйлстэй санал

нэг байв. Тухайлбал, төрийн бодлого нь нэг бол малчдад хүрдэггүй буюу үр дүн бий болгодоггүй, эсвэл хэрэгждэггүй, учир нь бодлого хэрэгжүүлэх механизм дутагдалтай, хэрэгжүүлэлтийн хяналт-шинжилгээ хангалтгүй, цаашлаад санхүүжилт дутмаг зэрэг асуудалтай холбоотой. Цаашилбал, малчдын бэлчээр, усны хүрэлцээг өсгөх, нэг малаас авах ашиг шимийг нэмэгдүүлэх, малчид хамтран бэлчээр ашиглалтын төлөвлөгөө гарган хэрэгжүүлэх, малчдын уламжлалт мэдлэгийг хадгалан шинэ үедээ дамжуулах зэрэг саналыг гаргасан. “Зэрлэг амьтан хамгаалал” бүлэг “Биологийн олон янз байдлын үндэсний хөтөлбөр (2015-2025)”-ийн хүрээнд зэрлэг амьтдыг тусгай хамгаалалттай газар нутагт хамгаалах тал дээр явуулж буй бодлогуудын үр нөлөөг сайн байгааг онцлон, НҮБ-ын цөлжилттэй тэмцэх конвенцыг Сүхбаатар аймагт маш амжилттай хэрэгжиж байгаа талаар жишээ татсан. Гэвч зэрлэг амьтдын тоо толгойн өсөлт, газрын доройтол, амьтан хамгаалах уу? эсвэл ба газар ашиглалтыг эрчимжүүлэх үү? гэсэн асуудал зөрчилдөөнтэй хэвээр байгаа бөгөөд эдгээр асуудлыг шийдвэрлэх сорилт нь болж, улмаар эдгээрийг зохицуулах эрх зүйн орчин дутмаг байгаа талаар саналаа хэлж байв.

Нийгмийн өөрчлөлтийг бий болгогч хүчин зүйлсийг тодорхойлох хэсэгт, хэлэлцүүлэгт оролцогчид тааламжтай (эерэг) ирээдүй, мөн тааламжгүй (сөрөг) ирээдүйг бий болгоход нөлөөлөх хүчин зүйлсийг тодорхойлсон. Эерэг ирээдүйд хүргэх гол хүчин зүйлс нь олон талыг тусгасан цогц эрх зүйн орчин, сайн засаглал, чадавхыг сайжруулах, боловсролын түвшинг өсгөх зэрэг багтана гэж авч үзжээ. Мөн түүнчлэн эдийн засгийн боломжийг нэмэгдүүлэх, уул уурхайн салбарт үр дүнтэй бодлого хэрэгжүүлэх, агаарын чанар, нийгмийн эрүүл мэндийг сайжруулснаар эерэг ирээдүй бий болгоно гэж үзжээ. Харин сөрөг ирээдүй бий болгоход нөлөөлөх гол хүчин зүйлс нь бусад улс, орноос үзүүлэх нөлөөллүүд, байгалийн баялгийг үр ашиггүй ашиглах зэрэг багтана гэж үзэв. Цаашилбал, шударга шүүхийн тогтолцоо алдагдах, ардчилал, эрх чөлөө боогдох зэрэг улс төрийн хямрал нүүрлэх, эрүүл мэндийн тогтолцоо нурах, ядуурал, тэгш бус байдал нэмэгдэх зэрэг нийгмийн өөрчлөлтүүд гарах, мөн импортоос хамаарах хамаарал ихсэх зэрэг шалтгаанаар эдийн засгийн хямрал нүүрлэх, хөдөө аж ахуйн гаралтай бүтээгдэхүүний чанар буурснаар өрсөлдөх чадвар сулрах зэрэг шалтгаанаар сөрөг ирээдүй бий болж болно гэж үзжээ.

Монгол улсыг хөгжлийг тогтвортой хөгжилд хүргэх гол арга зам нь үр дүнтэй бодлого хэрэгжүүлэх, чадавхыг нэмэгдүүлэх, боловсролын чанар, хүрэлцээг нэмэгдүүлэх гэдэгтэй хэлэлцүүлэгт оролцогчид санал нэг байв. Эдгээр асуудлыг шийдвэрлэхийн тулд дээрх үйл ажиллагааг санхүүжүүлэх эх үүсвэр шаардлагатай. Монгол орныг тогтвортой хөгжүүлэх алсын харааг боловсруулахад дээрх асуудлыг шийдвэрлэх шаардлагатай болно. Дараагийн хэлэлцүүлгээр Монгол орны тал хээрийн экосистемд тогтвортой амьжиргааг дэмжих хувилбарыг үнэлэх, үнэ цэнийг тодорхойлоход анхны хэлэлцүүлгийн дээр дурдсан үр дүнг уялдуулан авч үзэх болно.



## Background

The research project “MORE STEP – Mobility at risk: Sustaining the Mongolian Steppe Ecosystem”<sup>1</sup> investigates social-ecological dynamics in the Mongolian steppe ecosystem. The objective is an early identification of a potential tipping point and its possible consequences for nature and society. In this context, land degradation and the reduced productivity of ecosystems caused by societal change processes such as urbanization or changes to the nomadic life are closely examined. MORE STEP pays special attention to wild and domesticated herbivores whose mobility is being increasingly limited. This research project seeks to contribute to the sustainable development of the Mongolian steppe ecosystem aiming in particular to:

- bring social and natural sciences together in order to identify societal drivers that lead to ecological tipping points;
- identify possible consequences for nature and society, including, for example, land degradation, the reduced productivity of ecosystems, changes to the nomadic life, mobility of wildlife and livestock in the context of societal change; and
- contribute to the sustainable development of the Mongolian steppe ecosystem.

As a collaborative project, MORE STEP pursues a transdisciplinary approach. Consequently, the project aims to integrate not only different scientific disciplines but also practitioners and other stakeholders. We, therefore, invited relevant stakeholders to the second stakeholder workshop in 2019 to provide insights on policy instruments and scenarios.



*Figure 1: Participants of the second MORE STEP stakeholder workshop 2019  
(Photo: D. Matias)*

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<sup>1</sup> To know more about MORE STEP, please visit the following website: <https://www.morestep.org>

## **Aims of the workshop**

Building upon the results of a stakeholder workshop conducted in 2017 as part of the project's preliminary phase (Mehring et al. 2018), this stakeholder workshop aimed to

- i) bring together the relevant stakeholders and inform them about expected outcomes of the project and its progress that had taken place since the preliminary phase,
- ii) identify and evaluate existing key policy instruments for wildlife conservation, pastoral mobility, and sustainable livelihoods,
- iii) classify the main drivers of future scenarios of sustainable development in Mongolia and pathways of transformation, and
- iv) develop a vision of these pathways towards transformation.



## Methods

The stakeholder workshop in 2017 identified relevant stakeholders to the MORE STEP project (Mehring et al. 2018). Thus, in the second stakeholder workshop, stakeholders such as local community representatives, *aimag*<sup>2</sup> and *soum* officials, and experts from national and international organisations, etc. were invited to participate (see Appendix for full list). A total of 52 participants attended. The agenda developed for this stakeholder workshop included input and interactive sessions (Table 1). The input sessions included an introduction to the main phase of the project and a summary of the outcomes from the stakeholder workshop that was conducted in 2017. During the interactive session, the participants from the study sites (see Figure 2) were asked to share their knowledge and experiences with respect to two topics: (1) policies and policy instruments and (2) main pathways towards societal change.

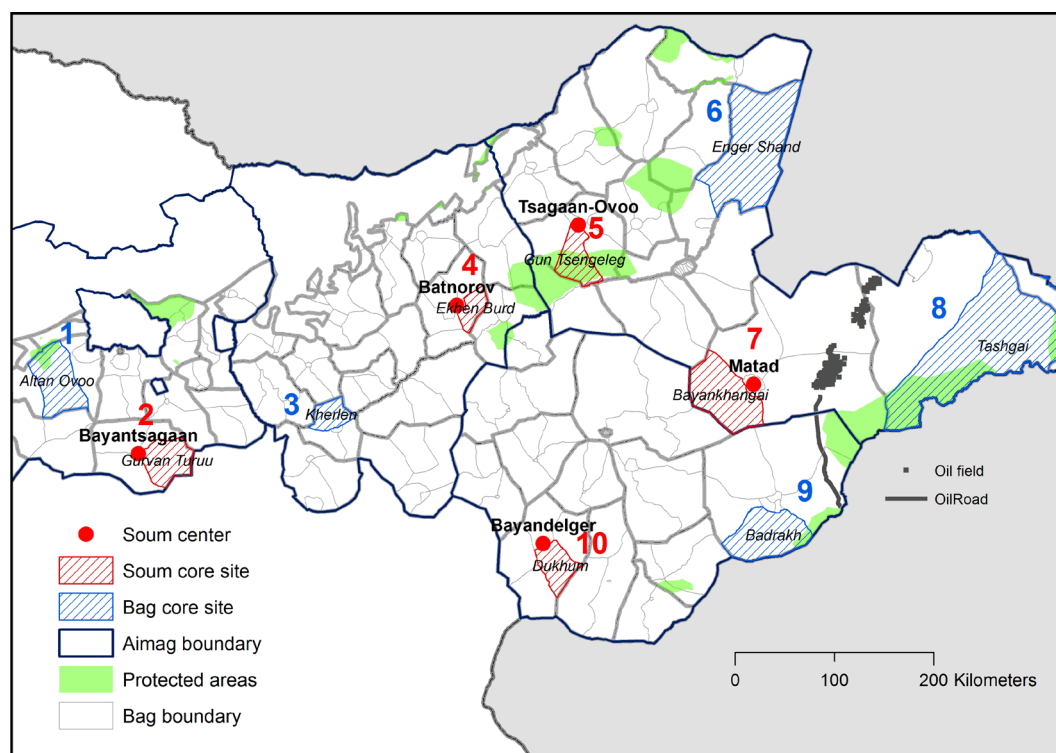


Figure 2: MORE STEP Study sites (Source: MORE STEP Consortium, n.d.)

<sup>2</sup> An aimag is a first-level administrative subdivision, which is equivalent to provinces in other countries. A soum is a second-level administrative subdivision, which is equivalent to counties or cities in other countries. A soum can be further subdivided into bags, which is equivalent to towns in other countries.

## Workshop implementation

The workshop consisted of input and interactive sessions (Table 1) and were held in the following order

- 1) opening a dialogue,
- 2) evaluating and analyzing existing problems, and
- 3) deciding upon suitable action.

*Table 1. Summary of the workshop agenda*

Session	Topic	Aim	Questions to the participants
INPUT SESSION	MORE STEP project	Presentation of the overall aim of the project	
INPUT SESSION	Outcomes of the stakeholder workshop 2017	Presentation of the results of the 2017 stakeholder workshop	
INTERACTIVE SESSION 1	Policies and policy instruments	Identifying and evaluating the effectiveness of policies and policy instruments	1) What are the existing key policies, their objectives, and instruments?  2) How effective are these instruments?
INTERACTIVE SESSION 2	Future scenarios	Identification of pathways of desirable and unfavourable development	1) Where do we want to go and how do we get there?  2) Where do we fear we might go? What will bring us there?
REFLECTION SESSION		Feedback from participants	

After the group sessions, a plenary discussion was convened. A simultaneous Mongolian and English translation of was provided for the whole duration of the workshop.

### Interactive session on policies and policy instruments

In the first interactive session focusing on the identification of existing key policy instruments and their impacts in Mongolia, participants were organised into three thematic working groups of Pastoral Mobility, Sustainable Livelihoods, and Conservation of Wildlife. The session aimed to identify and evaluate the most important policies on pasture management based on the participants' experience and knowledge by discussing the following questions:

- 1) What are the existing key policies, their objectives, and instruments?
- 2) How effective are these instruments?

In this interactive session on policies, the focus group discussion method was used to stimulate and facilitate discussion among the participants. The method is widely used in qualitative organisational research to open up access to a collective experience in a community living space, and to also gain an implicit everyday knowledge that guides actions of key actors (Kühl/Strodtholz/Taffertshofer 2009). The participants discussed and evaluated key policies and their implementation in pasture management and identified policy gaps. Furthermore, the participants also suggested ideas for research topics and questions.

### **Interactive session on main pathways towards societal transformation**

The second interactive session focused on future scenarios and aimed to identify the factors that will be most important for Mongolia's future within the next 30 years. These factors will be used as drivers of future scenarios that will be jointly developed and subsequently integrated in computer simulations. The participants were split into two groups per scenario (desirable versus unfavourable scenarios) and were assigned one of the two questions:

- 1) Where do we want to go and how do we get there?
- 2) Where do we fear we might go? What will bring us there?

Participants were invited to participate in a modified focus group discussion during which initial discussions were done in pairs, who subsequently shared their insights to the larger group. The second interactive session focused on developing a vision that can be used for scenario development and analyses. Scenario analyses provide a useful means to understand the dynamics underpinning different potential pathways towards future development (Sitas et al. 2019). Mongolia is rapidly developing and there is a need to define the direction this development could take. In this stakeholder workshop, the participants identified the best- and worst-case trajectories of sustainable and unsustainable development in Mongolia and the main drivers of scenarios or plausible futures. By assessing different interventions and their future trajectories, this interactive session set the scene for the third stakeholder workshop, which will focus on an assessment and valuation of different development options and on formulating recommendations on how to sustain the Mongolian steppe ecosystem while enabling social developments.

# Results

## 1. Interactive session on policies and policy instruments

In this session, participants identified key agricultural and rural developments, conservation policies, their objectives and policy instruments and they discussed their effectiveness for sustainable pasture use and conservation. The three thematic working groups were labelled as follows: (A) Pastoral Mobility, (B) Sustainable Livelihoods, and (C) Conservation of Wildlife. At the end of the session the participants formulated several research topics and questions that require further investigation. The summaries of the group discussions, research topics, the open questions that had been identified, and key statements of participants were as follows:

### (A) Pastoral Mobility Group

The group identified the key policies and policy instruments relevant for pastoral mobility and critically evaluated their implementation. The participants mentioned that, “policies often do not reach herders” and that “they are rather of a symbolic nature and that have not been implemented in practice”. Poor monitoring of policy implementation and inadequate financing are main reasons for this. In addition, the contradictory situation of private ownership of livestock and public ownership of land makes pasture management very difficult. Participants highlighted the following key topics that need political responses: access to pasture and water, livestock productivity, and pasture use planning at the *soum* and *bag* level.

#### *Access to pasture and water*

Participants stated that access to resources, such as water and pasture, requires attention on the part of the responsible organisations (e.g., the Ministry of Environment and Tourism of Mongolia, Ministry of Food, Agriculture and Light Industry of Mongolia, Ministry of Construction and Urban Development of Mongolia). An important regulation relevant for this issue is the Land Law (Government of Mongolia 1994). Based on this, herders obtain land certificates (up to one hectare) for winter and spring camps. During the group discussion, participants mentioned that these certificates offer protection of pasture access to the individual herders. A new pasture legislation is expected to address this issue, but a draft of the new Pasture Law has yet to be approved by parliament. If approved, the new law will institutionalize a Community-Based Rangeland Management (CBRM)<sup>3</sup> approach incorporating the organisation of Pasture User Groups (PUGs), transfer of pasture use rights to these groups, and the establishment of pasture fees to support herders and protect their livestock and pastures. A number of participants voiced their support for this approach.

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<sup>3</sup> CBRM refers to formally-organized groups.

Access to water is another crucial factor that hinders pastoral mobility. Participants expressed the need for more accurate and verified information about water sources in order to improve access to water.

#### *Livestock abundance and productivity*

The National Livestock Program (2010) is one of the key policy instruments that was discussed by the participants. The program has several objectives, including improving productivity of livestock and developing intensive farming. Participants, however, stated that the program had been poorly implemented and had been largely ineffective due to a lack of funding. In a more recent development, the Prime Minister's office approved a national program to develop intensive animal husbandry (2019-2023)<sup>4</sup>. Some participants were also critical about rewards for “the best herdsman who has a thousand livestock head” and “the owner of golden offspring” that motivate herders to increase their livestock, but do not provide incentives for sustainable pasture use. Stakeholders recommended changing the reward system by setting a limit on livestock numbers, while improving livestock quality and increasing herders' responsibility. Cultivation of crops for fodder production need further attention from policymakers as herders have been experiencing fodder shortages, which increase livestock vulnerability to droughts and *dzuds*.

#### *Pasture use planning at the local level*

The participants acknowledged that the capacity to improve pasture management has been increased at the community (*soum*) level. For instance, three new job positions were created in the agriculture department of *soums*, including one for a pasture management expert. However, as participants observed in many cases, the person selected for such positions does not always have the necessary competency nor a clear job description on pasture management. It was suggested that data sharing among responsible governmental organisations and a more precise pasture use planning will improve the effectiveness of this policy instrument.

### **(B) Sustainable livelihoods**

The participants highlighted core elements of the grassland ecosystem, such as humans, pastures and livestock and brought up sustainable livelihood issues that are also outlined in Chapter 5: “Sustainable Livelihoods, Poverty Eradication and Reducing Inequalities” of the Intergovernmental Panel on Climate Change (IPCC) Special Report on the Impacts of Global Warming (Intergovernmental Panel on Climate Change 2014).

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<sup>4</sup> The program has a substantial budget and will support capacity building of managers and professional associations of intensive animal husbandry, development of cluster systems, import of high productive livestock, food safety measures, introduction of new technologies, as well as support for processing and export of meat (International Monetary Fund 2019).

These issues are also included in the Sustainable Development Goals (SDGs). In Mongolia, the Sustainable Development Vision 2030 and the Green Development Action Plan (2016-2030) are major policy instruments.

The participants critically discussed relevant governmental programs, including the National Mongolian Livestock Program of 2010 and other governmental initiatives that support cashmere production and regulate pasture use. According to the participants, the main question is how to implement the declared policies, as the implementation mechanisms are unclear. These mechanisms include assessment and monitoring methods and market-driven approaches, which have been lacking so far. Therefore, the current governmental four-year policy is difficult to carry out. Furthermore, a long-term comprehensive master plan that addresses existing sectoral gaps and needs of the agriculture sector is required. The participants also highlighted the importance of knowledge transfer for improving herders' livelihoods.

#### *Policy implementation mechanisms*

The participants argued that the policy instruments should be measurable and supportive of both supply and demand sides of the agribusiness value chain. Up to now, the current policy instruments have only focused on the supply side, showing that the policy instruments are non-systematic and non-comprehensive. For example, there are incentives to develop leather products, but there is no policy to support the demand or buyer side. All participants agreed that a new policy instrument is needed to support the creation of new markets and to integrate local and international demand.

#### *Knowledge transfer*

The participants stated that herders need traditional and new knowledge to sustain their livelihoods. However, the mechanisms that support transfer of new technologies and provide education to herders are missing. Furthermore, herders need to be better informed about policies and policy instruments to increase policy recognition and compliance.

### **(C) Wildlife conservation**

The group identified several key policies and policy instruments of wildlife conservation and discussed their effectiveness. For instance, the group noted that Mongolia signed 14 international conventions and agreements, and five protocols. These include the United Nations Framework Convention on Climate Change (UNFCCC), the United Nations Convention to Combat Desertification (UNCCD), the Convention on Biological Diversity (CBD), and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). Mongolia also implements species-specific national programs to protect the Przewalski's horse (*Equus ferus przewalskii*) and the Gobi bear (*Ursus arctos gobiensis*). Within these programs, several educational and awareness building activities have been organised. Stakeholders discussed the key challenges and



policy gaps related to wildlife decline, land degradation, and tensions between wildlife conservation and land use.

#### *Abundance of wildlife*

The participants acknowledged the effectiveness of protected areas for wildlife protection that the National Biodiversity Conservation Program (2015-2025) implements. However, the group also agreed that wildlife conservation is limited to protected areas and such protection is not sufficient for highly mobile animals such as the Mongolian gazelle. Moreover, participants argued that in Mongolia there is a lack of conservation policy instruments to protect wildlife from diseases. In 2017, around 4000 Mongolian saiga (*Saiga tatarica mongolica*) died from the outbreak of goat plague (*peste des petits ruminants* or PPR), but there was no political response. While there is the national plan and relevant policies in place to protect wildlife in Mongolia, some important species are not included in these policies<sup>5</sup>. Furthermore, implementation of CITES is not possible for animals that inhabit transboundary areas such as areas that share a border with China, which has not ratified the convention.

#### *Land degradation*

Participants disagreed about the impact of policies on land degradation. Some stakeholders assessed the implementation of the UNCCD program in the country positively. In their view, successful experiences were made in Sukhbaatar *aimag*, where the program was designed and implemented. Others pointed out that its implementation was rather weak in the eastern region due to a lack of financing and poor land-use planning. All stakeholders, however, agreed that a new policy or regulation should always be followed by an implementation program.

#### *Tension between wildlife conservation and land use*

Participants stated that policies on environmental assessment and monitoring of mining activities are directly and/or indirectly related to wildlife conservation. For example, mining activities strongly contribute to land degradation and limit wildlife mobility. The group argued that the relevant policies and policy instruments were difficult to implement as standards for policy implementation are not satisfactory. Another reason for poor implementation are contradictions among legislations<sup>6</sup>, namely the Law of Environmental Impact Assessment (Government of Mongolia 2011), the Law on Environmental Protection (Government of Mongolia 1995) and the Mining Law (Government of Mongolia 2006). Apart from that, the group discussed the tension between wildlife protection and pasture use by herders. In some cases, rights to protect wildlife limit herder rights to use pastures and vice versa.

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<sup>5</sup> For instance, Baillie et al. (2006) present a list of species whose presence is occurring within Mongolia.

<sup>6</sup> Some examples of such contradiction are documented by John D. Farrington (2005): “licensed and unlicensed mineral activities in protected areas, buffer zone disturbance, and prevention of the establishment of proposed protected areas.”

## Research topics and questions that require investigation from the participants' perspective

- Who is responsible for absentee herding and *otor* livestock?
- How can the use of pastureland be regulated for different use purposes, such as agriculture, hay production, mining areas, and road infrastructure?
- How can herders be provided with opportunities to choose pastureland and practice *otor*?
- How can the conflicting view between pasture as public property and livestock as private property be resolved?
- How can incentives for responsible and intelligent livestock husbandry, pasture improvement and increase of livestock productivity be promoted?
- As attaining better pasture management is the aim of MORE STEP, the research should consider including studies across the value chain, starting from the soil to the end-products (e.g., potential high quality and healthy products) up to the end-users of these products.
- What is the socio-economic and environmental impact of pastoral mobility (e.g., movement to pastures close to settlement areas and movements to remote pastures)?

## Statements by stakeholders

*"The migration to soum centres has dramatically increased and otor mobility has been significantly reduced in recent years. Pasture degradation occurs due to increased air pollution [dust storms], soil and water pollution, late rains and hot summers. Furthermore, the herders' lifestyle is shifting to urban settlements. In other words, they are staying close to their winter pastures around the year due to a lack of water, transportation infrastructure, and reserved pasture areas. Pastures have been destroyed due to land degradation, droughts, and rodents. There is no policy that regulates mobility."* - A bag leader, Altanbulag soum, Tuv province

*"Livestock industry is one of the sectors well-known to every Mongolian. Many national as well as international projects and programs on livestock were implemented and many new programs and plans have been created. However, these projects and programs are tailor-made for their own goals and each consider livestock husbandry issues from their own angle. For example, the areas of pasture, herder livelihood, wool and cashmere, wells, remote-indexed insurance etc. exist rather separately from each other"* - A representative of the National Agency for Meteorology and Environment Monitoring (NAMEM)

*"It seems that overgrazing is widespread as well as the destruction of plant and wildlife due to a lack of water and drought of microclimate. If there are policies, they seem to be either not effective or not implemented. Marginal (sheep slope) areas should be protected from grazing. More value added [agricultural products can be] produced on adequate areas. Restrictions on livestock number while improving income through quality. Policy changes must be done in consultation with herders, they can't just be imposed."* - A researcher and representative of the Kreditanstalt für Wiederaufbau (KfW)

## II. Interactive session on main pathways towards societal transformation

During the second interactive session on future scenarios two images of the future were discussed: A desirable (positive) future and an unfavourable (negative) future with their respective drivers, prospects, and measures as decisive factors for these futures. During the workshop, a clear distinction between the types of decisive factors could not always be maintained. Therefore, the decisive factors were re-classified afterwards and assigned to superior frames that address overarching societal fields of action. The subsequent order of the drivers in the respective summary is based on the weighting given by the stakeholders during the workshop. The drivers that were most frequently identified as important are listed first and are printed in bold in Table 2 below.

### (A) Main drivers of a positive future

**A1: Legislation and governance:** Comprehensive legislation, good and transparent governance, and law enforcement (partly including decentralisation)

**A2: Education:** Capacity building and national education reform

**A3: Economic opportunities:** Improved market access, production and (national or global) marketing of high quality (animal) products

**A4: Legislation on mining:** Effective regulation of mining that considers public welfare

**Main driver #A5: Healthy environment and people:** Development of renewable energies and public transport to improve air quality and public health.

### (B) Main drivers of a of negative future

**B1: Global pressures and misuse of natural resources:** Environmental, pasture, and soil degradation; desertification; climate change; more frequent disasters, water shortage; overpopulation of livestock; and lack of public control over extraction of fossil resources

**B2: Political crisis:** Loss of justice and democracy, missing transparency, weak political participation, and lack of law implementation

**B3: Societal change:** Deterioration of the health system, increasing poverty and inequality, loss of food safety, loss of language and culture, and change of herders' lifestyle

**B4: Economic crisis:** Declining quality of agricultural products, low competitiveness, and high import dependency

Table 2. Results of the visioning for desirable and unfavourable developments in Mongolia

<b>(A) Positive future</b>			
<b>Frame</b>	<b>Factors</b>		
	<b>Prospects</b>	<b>Drivers</b>	<b>Measures</b>
<b>Education</b>	A good educational level of the general public	<b>Capacity building in different sectors</b>  <b>Educational reform</b>	Establishing universities at province level  Increase staffing capacity in education
<b>Legislation and governance</b>	Stable state and government  <b>Corruption-free state</b>	<b>Comprehensive legislation</b>  <b>Good and transparent governance</b>  <b>Law enforcement</b>  <b>Decentralisation</b>	Establishment of (social) services and infrastructures on a local level
<b>Economic possibilities</b>	Modern and stable herding will develop sustainably  Environment, natural and cultural heritage are protected  Being competitive on (global) markets	Improved access for herders to international markets  Animal products: less quantity, more quality  Production and marketing of high-quality products (nationally or globally)	Breeding for branding  Taxation and incentives
<b>Legislation on mining</b>	Effective environmental protection  Revenues of mining are beneficial for the Mongolian people	Regulation of the mining sector	Termination of the Dubai agreement <sup>7</sup>  Public ownership of mining facilities (e.g. <i>Oyu Tolgoi</i> )
<b>Healthy environment and people</b>	Use 100% renewable energy  Clean air in Ulaanbataar and throughout the country	State support and promotion of wind and solar energy  Improved public transport	

<sup>7</sup> The term 'Dubai agreement' refers to an agreement between the Mongolian government, the Oyu Tolgoi LLC company and some of its major shareholders with the official name "Oyu Tolgoi Underground Mine Development and Financing Plan" concluded in Dubai in May 2015. The agreement deals with the mining development and financing of the "Oyu Tolgoi", a copper-gold mine in the South Gobi region of Mongolia. ([https://www.ot.mn/media/ot/content/Agreements/2015-05-18\\_OTUMDAFP.pdf](https://www.ot.mn/media/ot/content/Agreements/2015-05-18_OTUMDAFP.pdf) - accessed online August 3<sup>rd</sup> 2020)

<b>(B) Negative future</b>			
<b>Frame</b>	<b>Factors</b>		
	<b>Prospects</b>	<b>Drivers</b>	<b>Measures/Omissions</b>
<b>Global pressures and misuse of natural resources</b>	<b>Pasture degradation</b> <b>Soil degradation</b> <b>Desertification</b> <b>Depletion of water resources</b> Loss of biodiversity More frequent animal diseases Loss of fossil resources	<b>Climate change</b> Overpopulation of livestock <b>Loss of state control over extraction of fossil resources</b>	Change of herders' lifestyle
<b>Political crisis</b>	Growth of corruption and bribery <b>Loss of justice and democracy</b> Unstable policy and planning	Lack of transparency Increased administrative burden as a result of state activities Lack of law implementation	Weak participation Missing public notification about laws and regulations
<b>Societal change</b>	Deterioration of the health system Corruption Loss of the Mongolian and other local language(s) and their culture Loss of food safety Loss of public security	Lack of progress in the education system Lack of hospitals and medical personnel Change of herders' lifestyle Poverty and inequality	Import of unregulated drugs Stalled development in rural sites
<b>Economic crisis</b>	Declining quality of agricultural products High dependency on imports	High number of livestock Unqualified workforces	No steps towards decentralisation No or ineffective educational reforms

## Conclusion and next steps

The results of this stakeholder workshop show how the Mongolian steppe ecosystem is a complex social-ecological system represented by the contextual factors of practices, knowledge, technologies, and institutions (consistent with the conceptual findings of Hummel et al. 2017). Prevailing herding practices and the local and traditional knowledge on the grasslands play a crucial role in herder decisions on livestock and pasture management. Mining technologies, motorized means of transport, mobile internet, and phone connection are important examples of decisive technologies within this system. Furthermore, it is becoming increasingly important to consider the role of institutions within ecosystem processes and functions since classical biophysical models do not directly consider institutional influences. An example is the government award given to the “the best herdsman who has a thousand livestock head,” which encourages herders to increase their livestock, without taking into consideration the carrying capacity of the pasture. A more drastic example is a direct administrative order in neighbouring Inner Mongolia to eliminate all livestock to facilitate the rapid grassland cover recovery in Duolun County (Chen et al. 2018). Apart from these factors that were identified during the session on policies and policy instruments, the factors identified in the session on main trajectories of societal transformation can contribute to evidence-based and context-sensitive policy making through the generation of transdisciplinary knowledge from multiple stakeholders who have different scales of decision making and knowledge (Oberlack et al. 2019). The results of this stakeholder workshop are, therefore, important for the further work of MORE STEP. The succeeding stakeholder workshops will incorporate these results and will focus on the discussion and assessment of different sustainability interventions for the Mongolian Steppe Ecosystem.

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# Appendix

## Stakeholders represented

Stakeholder group	Name of organisation
National government	Mineral Resources and Petroleum Authority
	National Focal Point of Mongolia for the United Nations Framework Convention on Climate Change (UNFCCC)
National government agencies	National Center for Public Health, Ministry of Health
	National Agency for Meteorology, and Environment Monitoring (NAMEM)
Local/ <i>aimag</i> /sum government	Altanbulag soum government, Tuv province
	Bayanmunkh soum government, Khentii province
	Batnorov soum government, Khentii province
	Bayandelger soum government, Sukhbaatar province
	Bayantsagaan soum government, Tuv province
	Erdenetsagaan soum government, Sukhbaatar province
	Matad soum government, Dornod province
	Dornod Governors' office
	Sukhbaatar Governors' office
	Khentii Governors' office
Foreign government agencies	Delegation of the European Union to Mongolia
	KfW Mongolia
	FAO Representative Office in Mongolia
Interest groups/unions	Herder representative from Bayantsagaan soum, Tuv province
	Herder representative from Altanbulag soum, Tuv province
	MNFPUG – Mongolian National Federation of Pasture User Groups of Herders
International organisations/institutes	People in Need
	Sustainable Fibre Alliance
	Mercy Corps
	WCS Mongolia
	Zoological Society of London
	The Nature Conservancy
	Senckenberg Frankfurt
	TU Dresden
National (and bilateral) organisations	ISOE Frankfurt
	Center for Nomadic Pastoralism Studies Mongolia (CNPS)
Academia	Hustai National Park (HNP)
	National University of Mongolia, School of Engineering and Applied Sciences (NUM)
	Mongolian Academy of Science (MAS), Institute of Geography and Geoecology (IGG)
	Mongolian University of Life Sciences, School of Economics and Business (MULS)
	Research Institute of Animal Husbandry (RIAH), Mongolian State University of Agriculture (MSUA)
	Mongolian Academy of Science (MAS), Institute of General and Experimental Botany

## Programme schedule

<b>Wednesday, August 28<sup>th</sup>, 09:30 – 16:30</b>	
<i>Time</i>	<i>Topic</i>
09:00	Arrival/welcome coffee
09:30	Welcome
5 Minutes	Opening Remarks
09:45–10:00	Aim of the workshop, agenda and introduction of participants
10:00–10:15	Keynote remark: Relevant national political frameworks (e.g. CBD, SDG, CMS)
10:15–11:00	INPUT SESSION: Aim of the overall research project Outcomes of the pre-phase project and Stakeholder Workshop in 2017
11:00–11:30	Coffee break
11:30–13:00	INTERACTIVE SESSION I: Policies and policy instruments
13:00–14:00	Joint lunch
14:00–16:00	INTERACTIVE SESSION II: Main trajectories of societal transformation
16:00–16:30	REFLECTION SESSION Next steps Analysis of results Outlook on next stakeholder workshop Evaluation
16:30	End of the workshop and joint coffee

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