Ministry of Environment and Tourism of Mongolia

Sixth National Report to the Convention on Biological Diversity (2015-2018)

Ulaanbaatar

2019

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Contents

Abbreviations

CBD	Convention on Biological Diversity
CBO	Community Based Organizations
ESD	Education for Sustainable Development
FAO	UN Food and Agriculture Organization
GDP	Gross Domestic Production
GEF	Global Environmental Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
GRIIS	Global Register of Introduced and Invasive Species
IRBM/IWRM	Integrated River Basin Management/Integrated Water Resources Management
ITPD	Institute of Teacher's Professional Development
IUCN	International Union for Conservation of Nature
KfW	KfW Development Bank of Germany
LEC	Lifelong Education Centre
LPA	Locally Protected Area
MAS	Mongolian Academy of Science
MECS	Ministry of Education, Culture and Science
MET	Ministry of Environment and Tourism
MoFALI	Ministry of Food, Agriculture and Light Industry
MoH	Ministry of Health
MSUE	Mongolian State University of Education
NBSAP	National Biodiversity Strategic Action Plan
NDA	National Development Agency
NEMA	National Emergency Management Agency
NGO	Non-Governmental Organization
NPBD	National Program on Biodiversity
NSO	National Statistical Office
NUM	National University of Mongolia
PA	Protected Area
PAA	Protected Area Administration
PPP	Public Private Partnership
PPR	Peste des petits ruminants

SDG	Sustainable Development Goal
SPA	Special Protected Area
SPAA	Special Protected Areas Administration
TNC	The Nature Conservancy
UNDP	United Nations Development Programme
WWF	World Wide Fund for Nature
ZSL	Zoological Society of London
MECSS	Ministry of Education, Culture, Science and Sports
MSUE	Mongolian State University of Education
Aimag	Province
Soum	County
MNT	Mongolian Togrog (Currency)

I.   Information on the targets being pursued at the national level

☒ My country has adopted national biodiversity targets or equivalent commitments in line with the Strategic Plan for Biodiversity 2011-2020 and the Aichi Targets

or

☐ My country has not adopted national biodiversity targets and is reporting progress using the Aichi Biodiversity Targets for reference. (Move to section II. In section III, the Aichi Biodiversity Targets should be used for the purpose of this report as the national targets and progress should be assessed towards their achievement in the national context.)

National Program on Biodiversity (2015-2025)

Mongolia became a party to the CBD on the 30th September 1993 and obliged and committed to implementing the requirements of the Convention and the Decisions of the CBD COP. The Convention requires countries to prepare a National Biodiversity Strategy and Action Plan and to ensure that this strategy is mainstreamed into the planning and activities of all those sectors whose activities can have an impact on biodiversity. The very first National Strategic Plan for the Biodiversity Conservation was prepared during 1994-1995 with financial support from the GEF. The final evaluation of the first National Strategic Plan for the Biodiversity Conservation carried out in 2010 showed that the implementation of actions and interventions set under the strategy had achieved 96 percent.

In 2010 at the COP 10 the Parties have adopted a revised and updated global Strategic Plan for Biodiversity including the Aichi Biodiversity Targets, for the 2011-2020 period. Moreover, during the past two decades since the first NBSAP of Mongolia, the country has witnessed drastic changes in all aspects of its development.

Therefore during 2014-2015 through an extensive consultation process, Mongolia had developed the Second National Program on Biodiversity (NPBD) that aims Government of Mongolia to coordinate and carry out biodiversity conservation and sustainable management throughout the country during 2015 to 2025. The second NPBD has been aligned with the Aichi biodiversity target to ensure the national contribution to the global conventions and aimed to strengthen existing policies on biodiversity conservation and sustainable management through direct interventions and sound inter-linkages with productive sectors' policies and programs.

The Program consists of 14 goals, 29 objectives, and 74 outputs within the frame of 4 strategies to ensure the conservation and sustainable use of Mongolia's biological diversity and has been approved by the Resolution No.325 of the Government of Mongolia on August 4, 2015.

In 2018, the Ministry of Environment and Tourism of Mongolia had prepared the "Medium term plan for the implementation of the National Biodiversity Program". However, the assessment under this National Report, does cover only intervention carried out prior the Medium-term plan was put in place.

Detailed information on each of the national goals, indicators, its' rationales for developing and main related Aichi targets are all can be found in "Section Four: National Biodiversity Program Strategies, Goals, Objectives and Outputs" of the National Program on Biodiversity.

English: https://www.cbd.int/doc/world/mn/mn-nbsap-v2-en.pdf

Mongolian: https://www.cbd.int/doc/world/mn/mn-nbsap-v2-mn.pdf

II. Implementation measures taken, assessment of their effectiveness, associated obstacles and scientific and technical needs to achieve national targets

Using the template below, please report on the major measures your country has taken to implement its national biodiversity strategy and action plan. Please also provide an assessment of the effectiveness of these measures. The template should be replicated for each measure reported.

STRATEGY 1. INCREASE AWARENESS AND KNOWLEDGE ON BIODIVERSITY AND SUSTAINABLE USE AMONG BOTH DECISION MAKERS AND THE GENERAL PUBLIC

Goal 1. The education for sustainable development is integrated into all level education curricula and this information is disseminated by at least 5 per cents of mass media.

Objective 1. To cohere and improve cooperation among policy developers, decision makers and general public in implementing program on education for sustainable development.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

The National programme for "Education" approved in 2010 foresaw concept for education for sustainable development, respect to own and other history and culture and skills development for innovative and creative thinking be integrated in all level of education material.

The National programme for "Education for Sustainable Development" approved in 2018, set the goal for incorporating educational policies and curricula at all levels with concepts lifestyles that are environmentally friendly, resource saving healthy and safe habits. Key findings from the implementation of the policies that directly contribute to National Biodiversity Programme objectives are summarized below for each education level.

At preschool education level, the Ministry of Education, Culture and Science (MECS) has approved in 2014, the "Essential programme for the Preschool Education" that incorporate six areas of support. The preschool children enrolment is assessed as part of the SDG 2030 indicator, and as of 2017, 92.1 percent of Mongolian preschool children are enrolled. In order to ensure proper implementation of the programme, every third of the preschool teachers are enrolled annually to one credit (24 hour) skills enhancement/refreshment training that offer teaching standard, teaching methodology enhancement, classroom curricula development, interactive teaching methodology etc.

In 2011, the MECS created a task force for integrating ESD principles into primary and secondary educational programmes that developed "Guideline for integrating ESD principles into 12 year education programme". In 2015 The MECS has approved the "The general direction and requirements for incorporating the ESD principles into the primary and secondary school's education programme and activities".

Traditionally, Mongolia has high level school enrolment and as of 2017, 96.3 percent of primary school children and 94 percent of secondary school children are enrolled in school, making 20.1 % of total population of Mongolia studying at school. The gender balance index of school enrolled children is 1.00, with small deviations at primate (0.95), secondary (0.98) and upper secondary (1.19) classes.
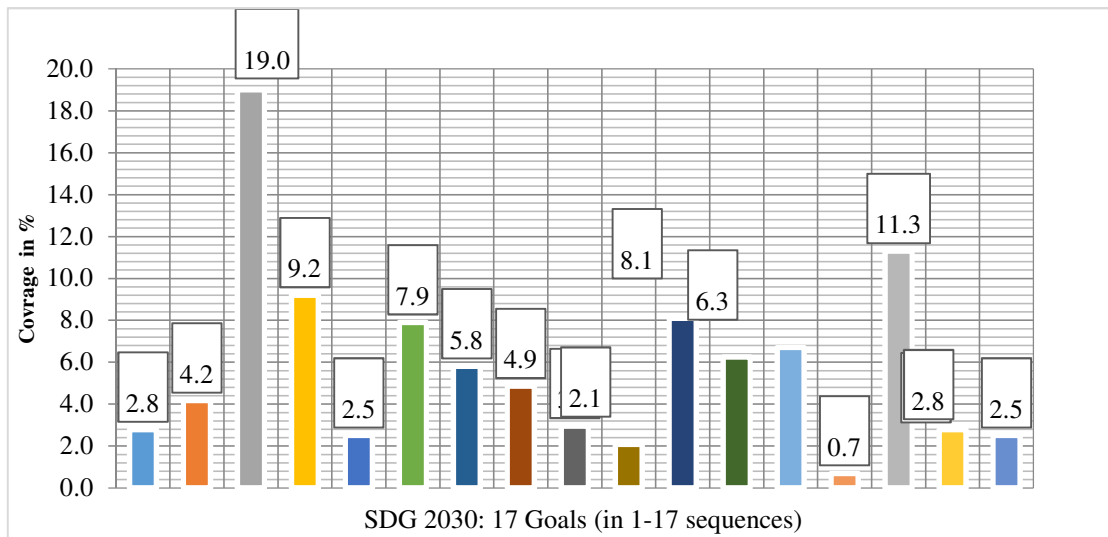
Figure 1. Primary and Secondary school curricula coverage for SDG goals

An assessment carried out in 2018 showed that school curricula's coverage for SDG goals are uneven and while SDG goal 3 was most covered the SDG goal 14 was least covered. At the same time, the assessment showed 25.0% percent of all curricula of primary classes, 38.3% secondary classes and 36.7% of the upper secondary classes have incorporated the SDGs.

Capacity building and refreshment training for primary and secondary school teachers are carried out at the "Teacher training institute" established in 2012. The Institute carry out capacity building refreshment training for 5070 teachers annually (13.7% of all teachers at national scale). The training curricula of the Institute has mandatory topics on Sustainable Development, Green Development and ESD, thus ensuring provision of adequately skilled teachers to all primary and secondary schools of Mongolia.

At college and university level, the curricula development is carried out in accordance with three generic directives issued by the MECS in 2014. In accordance with these directives, each colleges and universities establish Curricula commission that develop tailored curricula. As of 2018, out of 96 universities and colleges, 72 universities' 250 programme were accredited by National Council and 90 programmes of 18 universities were accredited internationally. The SDG principles are one of the requirements for accreditation, however, there is no assessment how SDG principles are incorporated throughout the national universities and colleges except few ad hoc cases.

> Box 1. ESD in Universities
>
> ➢ With the support from Ministry of Environment and Tourism and UN Adaptation Fund, 2 credit hour program with modules titled "Climate and Ecosystem", "Climate Change and Society" and Mitigation and Adaptation to CC were developed. Since 2016, Mongolian National Education University has included this program.
> ➢ University of Humanities included 3 credit hour subject "Ecology, Sustainable Development" in their mandatory study subject. The University also has class "Environmental journalism" with 20 student annually enrolled
> ➢ Applied Science school of Mongolian National University has 2 credit hour mandatory subject "Sustainable Development"

Overview of college and university graduate show that business administration and law attract 26.1-27.5 percent of all students during 2014-2018 school year followed by education and 59.4 percent of all students (nationwide) during these years were female. Inclusion of SDG principles in the curricula in these fields, will therefore, have a long-term impact.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:
➢ By 2018, the concept of education for sustainable development is integrated into all level education curricula and a necessary human resources' capacity is improved.

The Education for Sustainable Development concept integrated to all levels of education system (preschool, primary secondary, upper secondary and university level) and capacity building and refreshment training for primary and secondary school teachers is being carried out regularly.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Burmaa, B. (2011). Integration of Education for Sustainable Development principles in the 12 - year curriculum for secondary education. Ministry of Education, Culture and Science, SDC. Soyombo printing LLC. Ulannbaatar. pp.88.

Order A/78 of the Minister of Education, Culture and Science, 2014

Order A/174 of the Minister of Education, Culture and Science

Attachment 2 of Order No. A/240 of the Minister of Education, Culture and Science, 2014

The Order of A/370 of the Minister of Education, Culture and Science

Appendix to Order A/220 of the Minister of Education, Culture and Science, 2015

The Order A/458 of the Minister of Education, Culture and Science on "Approval of the Roadmap" of 2015

Study on the Sustainable Development Concept, Content and Methodology in the core curriculum of Secondary Education School. (2018). MECS, MSUE. Ulaanbaatar. pp 210.

Statistical Information. Ministry of Education, Culture and Science.

Nergui, N., et al. (2018). Assessment of the concepts, content and methodology of the ESD for elementary and secondary education teachers and senior management staff. ITPD Sustainable Development – National Assembly on Preschool Education: Presentation by the ITPD. Ulaanbaatar.

Project report. (2014). Early childhood education for children of rural, nomadic and migrants project. Ulaanbaatar, 2014.

Goal 1. The education for sustainable development is integrated into all level education curricula and this information is disseminated by at least 5 per cents of mass media.

Objective 2. Provide the general public with systemized and comprehensive knowledge on sustainability.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

There are number of policy documents in Mongolia that integrate the sustainable development and ESD principle into the social-economic development of the country. These include Law on Education (revised in 2015), State policy on Education for 2015-2024 (2015), National programme "Education – 2021" (2010), National program for Education for Sustainable Development (2018), Green development Policy (2014) and Sustainable development vision for 2030 adopted by the Parliament in 2016, and many other policy documents.

The common feature of these policy documents are i) special highlights on values of ESD; ii) focus on delivering ESD to all age groups, and; iii) focus in integrating the ESD to diverse training programmes. This has become even more prominent since 2016, which can considered as a beginning of phase for integrating the ESD to all levels of education process.

Provide the general public with systemized and comprehensive knowledge on sustainability	Action plan for implementation of Green Development Policy (2016-2030)	**5.1.4.** Support Eco School initiative to promote environmentally friendly lifestyle and traditional environmental conservation is embedded to youth and children's attitude and appropriate behavior. **5.2.** 5.2. Promote implementation of Environmental management standard - MNS ISO1400 in companies and organizations and create efficiency both in production and consumption.
	National Program for Education for Sustainable Development (2018-2023)	By 2022, 50 percent of all pre-, primary- and secondary schools are enrolled with the international Eco-school programme
	Sustainable Development Vision of Mongolia -2030	2.3. Environmental Sustainability: - Promote participation of local residents and people at large to ensure environmental sustainability; - Encourage environment-friendly attitude and appropriate behavior

Figure 2. Examples of ESD principles' integration into different levels of policy documents

The majority of the Sustainable development and ESD interventions are targeting children through the "eco-club" and "eco-school" initiatives. These initiatives are receiving an extensive supports both from the government, international organizations and civil society.

The "Eco-school" initiative in Mongolia applies ISO 14001/EMAS standard and led by "Environmental Information, Education Centre" NGO – a member of Foundation for Environmental Education. Since 2015, the initiative has expanded its work with the support of the SDC financed project for ESD. As of 2018, 286 schools (35.5% of all secondary schools of Mongolia) have become a part of the Eco-school initiative. However, involvement of pre-schools in the initiative has been very negligent (only 4 kindergartens).

The Eco-clubs are considered as most traditional interventions that support school children's initiative. These eco clubs more focused on ecological education have diverse focus that reflect local needs and environment.

The "Lifelong Education Centre" (LEC) that has branches throughout the country plays important role for extending the ESD principles outside the schools and universities. As of 2018, there are 425 LECs are operating throughout the country with 630 staff. The LECs operate at national, provincial and local level, with distinct responsibilities as summarized in figure 3.

Lifelong Education Center's contribution to the ESD
Advocacy for Sustainable development, Green development concepts
Increase ecological education
Teaching on livelihoods and lifestyles
Changing people's attitude and behavior

At national level: MECSS/National Center for Lifelong Education	Provincial level: Education and Culture Departments	Local level: Livelong Education Centers in Counties and Districts

• Policies and Decisions on ESD
• Conduct research
• Carry out TOT
• Preparation of specialists
• Provision of consultancies and advices
• Data base running
• International partnership
• Securing funds
	• Implementation
	• Data collection and provision
	• Carry out training
	• Provision of consultancies and advices
	• Project and Programme Implementation
		• Carry out different training focused:
		  ◦ Provision of ESD
		  ◦ Income generation
		  ◦ Information dissemination
		  ◦ Livelihoods option

Figure 3. Delivery of ESD through the "Lifelong Education Centre"

During 2014-2018, the LECs have carried out 36 training in rural areas dedicated to the sustainable development and ESD. The number of people benefitted from the LEC conducted trainings have been steadily increasing since 2014 (figure 4) and in general women's were main beneficiaries. The analysis of 593 participants involved in training carried out by LEC in 2016 clearly show this gender differentiation as shown in figure 5.
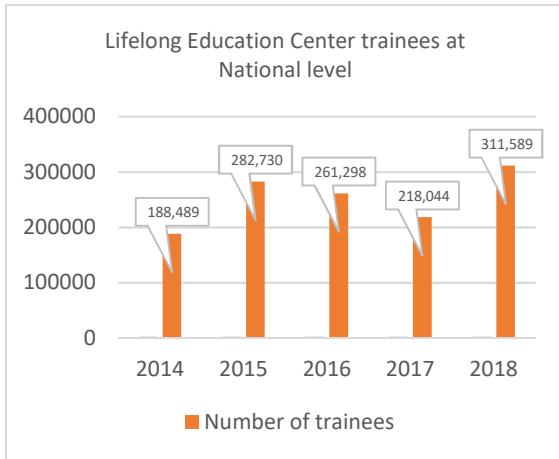
Source: Lifelong education Center

Figure 4. LEC beneficiaries
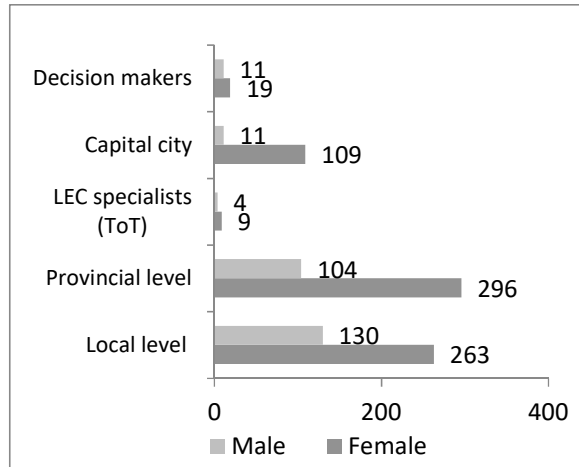
Source: Lifelong education Center

Figure 5. LEC trainee's Gender profile

However, the survey carried out by the LEC show that public understanding about the sustainable development, green development and ESD are still insufficient and the knowledge about the biological diversity among survey respondents has fared even less than the others (table 1). The survey had also revealed that majority of interventions have good outreach capital city and provincial level (45.6% and 33.5% respectively) but not reaching the primary administration level (7.3%).

Table 1. Public perception on sustainable development

	Survey answers		
	Good	Not enough	Don't know
Knowledgeable about SD and ESD main principles	11,2% (60)	76.8% (409)	12% (64)
Knowledgeable about the Green Development Policy of Mongolia	10.1% (54)	64.1% (342)	25.8% (137)
Knowledgeable about the ecological footprint issues	7.3% (39)	79.6% (424)	13.1% (70)
Knowledgeable about the Climate Change issues	6.1% (32)	79.7% (425)	14.2% (76)
Knowledgeable about the biological diversity	1.7% (9)	81.9% (437)	16.4% (87)

Source: Lifelong education Center, XXXX

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:
➤ By 2018, the national communication programme and action plan on education for sustainable development for all age groups is in place.

Despite general public's slow take up sustainable development and ESD concepts, the country has been remarkably successful, integrating the SD goals in its national policies and programmes and monitoring its' progress vigorously.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Burmaa, B. (2011). Integration of Education for Sustainable Development principles in the 12 - year curriculum for secondary education. Ministry of Education, Culture and Science, SDC. Soyombo printing LLC. Ulannbaatar. pp.88.

Order A/78 of the Minister of Education, Culture and Science, 2014

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Project report. (2014). Early childhood education for children of rural, nomadic and migrants project. Ulaanbaatar, 2014.

Goal 2. Establish the biodiversity sub-database through improving the content and access to the National Environmental Information Database and ensure its use in decision making.

Objective 3. Create a state and private enterprise framework and development of economic incentives that support research on biodiversity.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

There has been many research studies carried out in the areas of biodiversity values, conservation, sustainable management that were supported by the state and other actors. In particular, the Government of Mongolia regularly allocate in the state budget for carrying out actions that are included in the Government plan of action based on the Ministry of Environment and Tourism (previously Ministry of Environment and Green Development) proposal. During 2012-2018, the Government has allocated MNT 25,550.00 million (over USD 10 mln.) for supporting green technologies including introduction of know-hows, resource efficient use, reuse and recycling especially waste water recycling. These interventions combined with environment related projects worth of approximately USD 900,000 financed through the Government special Fund for Science and Technology form the state support for the research and extension work in biodiversity field. Other key players in the field of environment and biodiversity related research work are universities, notably the National University of Mongolia, multi- and by-lateral agency supported projects and international conservation NGOs that work in Mongolia.
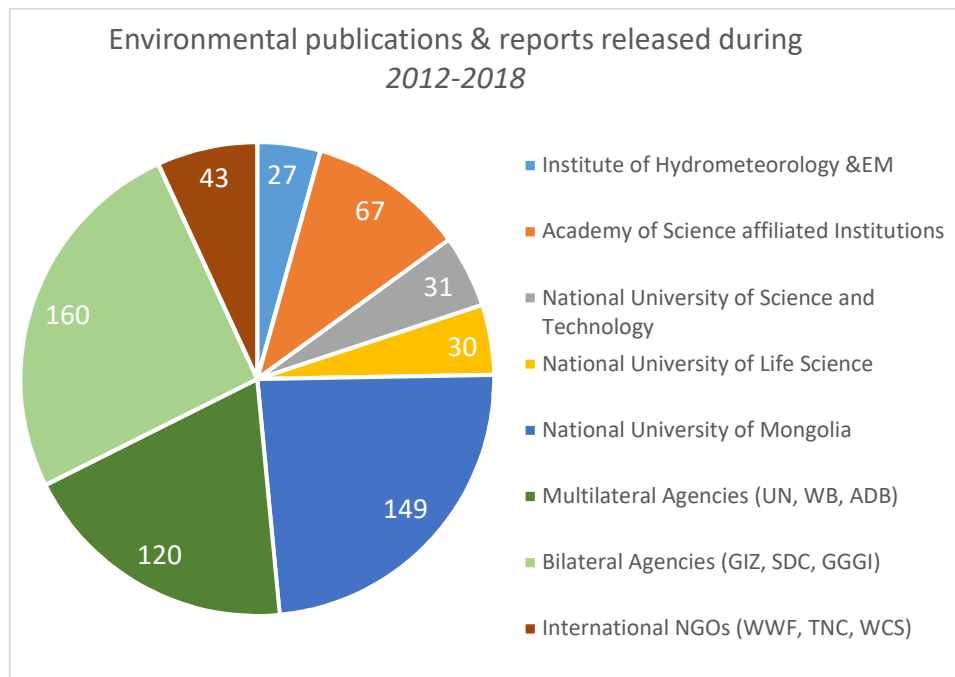
Figure 6. Environmental publications and report released by various institutions during 2012-2018

In recent years, the researchers and professors from the Academy and Universities have published number papers in internationally known journals listed in Thomson Reuters index which is applaud able for bringing to the international level the work carried out in the country. However, the impact of these study work on the ground becomes questionable, due to fact that it is written in foreign language and not accessible to majority of public. The same applies also for some of the multilateral and bilateral organizations' work that are published either in English or outside Mongolia. For example

one bilateral funded project on water resources management has published total of 84 research papers, books and reports none of which were written in Mongolian, thus making the findings of the project almost irrelevant to Mongolia's conservation work.

These issues, combined with lack of two way communication with grassroots, inherent to most of the research work - local and international alike, are making all valuable lessons and findings not fed into local policy and practical interventions.

➢ It is also observed that private sectors' support to the research on biodiversity protection, its sustainable use, awareness and values has been very negligible. With the implementation of new law on Fauna that linked hunting permissions with mandatory wildlife population assessment, the private sector and CBO responsible for the hunting areas have allocated MNT 300 men MNT (~USD120,000) for wildlife and game species assessment in the 60 hunting areas located in 12 provinces.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

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Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2018, a mechanism is created to use state and private funding to do vital research on biodiversity protection, its sustainable use, awareness and values.

The Government, international organizations, universities and international NGOs are currently funding almost all research work on research on biodiversity conservation, sustainable use and awareness raising. Private sector involvement in biodiversity related research is negligent and limited to game management.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Annex to the Government Resolution # 120. 2012

Annex to the Government Resolution # 45. 2016

Goal 2. Establish the biodiversity sub-database through improving the content and access to the National Environmental Information Database and ensure its use in decision making

Objective 4. Improve the mechanism for systematic delivery of biodiversity related information and data on its state to general public and decision makers.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

It is standard that all programs and strategies of Mongolia, including all environmental conservation, natural resources management and sustainability related programs, has dedicated section focused on public awareness raising participation. In 1999, the Government of Mongolia has developed dedicated National Program on Environmental awareness raising in attempt streamline and coordinate the environmental awareness raising.

However, the assessment of environmental awareness raising work carried out during 2008-2012 showed that environmental sector's communication to general public mostly built around the public sector's reporting on their work and broader environmental education awareness communications are still lagging.

The National Programme on "Education for Sustainable Development" approved 2018 is considered as an important policy document for ensuring public education towards sustainable development, environmental conservation, adaptation to climate change and promotion of environmentally friendly and healthy lifestyle. Three out of four of its objective address the public awareness and participation in i) sustainable production; ii) education, information services in equal, fair manner; and iii) sectoral coordination for implementation of ESD.

The Press Institute of Mongolia has been producing annual review report on Mongolia's press and media over the past 20 years. 2018 annual report showed that as of May 2018, some 434 companies with total of 4462 staff are working in the media sector. Compared to 2017, printed media has declined and majority of population receive their information from TV (90 percent of survey respondents) and with the increased internet speed the social media and internet has become second largest information provider (48.3% of the survey respondents) to the public. Yet, the share of information on the environmental topics has not been substantially improved since 2006 and as of 2018 only 1.7% in printed media and 1.3% of radio and TV broadcast topics covered environmental issues.

To address this gap since 2009, the Press Institute, UNDP, FAO, SDC and WWF have initiated "Green planet club" to build journalists' professional capacity and expand environmental coverage. The ESD project supported SDC has further deepened the initiative and developed handbook titled "Interviewing on Sustainable Development, ESD and Green Development" designed for journalists and trainers.

Box 2. 21 topics included in Teachers Handbook for "Interviewing on Sustainable Development, Education for Sustainable Development and Green Development

1. Interviewing on Sustainable development
2. Interviewing on Education for Sustainable Development
3. Environmental Journalism
4. Climate Change
5. Natural Resources Use
6. Environmental Pollution
7. ISO 14000 family of Standards
8. Green Economy and Green Development Policy
9. Transition to the Green Economy
10. Sustainable and green production, sustainable and green consumption
11. Corporate social responsibility
12. Green job and green office
13. Green procurement
14. Interviewing social deliveries
15. Gender and Journalism
16. Human right issues and Humane Journalism
17. Indicators for Media Development, professional ethics and journalists social responsibility
18. Investigative Journalism
19. E-journalism
20. Data journalism

Assessment carried out through the ESD project in 2018, showed that 40 percent of the respondents considered their knowledge about the sustainable development less than satisfactory, 55.5 percent somewhat knowledgeable and only 3.9 percent very knowledgeable. At the same time, the participants of the survey expressed strong attitude towards need for passing the natural resources to the next generation, environmentally friendly production and energy efficiency. The assessment also show different needs for information among rural and urban residents
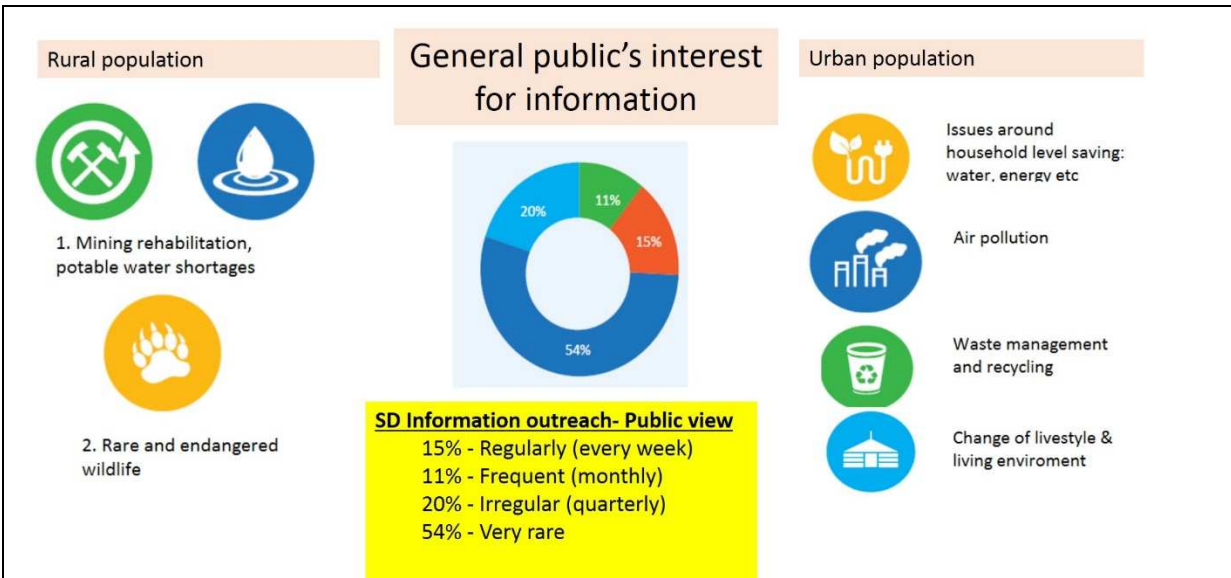
Figure 7. Public need for information related to environment and sustainable development

The different data bases and websites supported by the Government and international organizations also playing important role in disseminating systemized information compiling and dissemination. The "Environmental Database" (http://www.icc.mn) under the Ministry of Environment and Tourism has 30 clusters and supported by user friendly GIS based and satellite based imageries and maps that allow users to have detailed information. The information available through this database is listed in the box 3.

Second important database is run by the Geography and Geo-Ecological Institute of Academy of Science (http://portal.igg.ac.mn) which has some 441 sources covering 10 sectors in 6 different types like maps, videos, presentations, books, research paper and report.

In 2017, under the project titled "Mongolia Biodiversity Database", the MET has established the National Biodiversity Taxonomy Committee. The experts of the Committee have compiled so far 760 species of vertebrates (1 species of Petromyzontes, 77 species of fish; 6 species of amphibians; 23 species of reptiles; 513 species of birds; 140 species of mammals and 5,919 species of invertebrates (187 species of helminths: 15 species of Trematoda, 94 species of Cestoda, 69 species of Nematoda, species of (Acanthocephala)); 46 species of Nematoda; 90 species of Rotifera; 34 species of Mollusca: Gastropoda; 545 species of Arachnida; 10 species of Maxillopoda; 22 species of Hexanauplia: Cyclopoida; 50 species of Branchiopoda; 103 species of Ephemeroptera; 59 species of Odonata; 159 species of Orthoptera; 56 species of Plecoptera; 3,166 species of Coleoptera; 9 species of Anoplura; 143 species of Hymenoptera: Apidae and Vespidae; 71 species of Formicidae; 198 species of Trichoptera; 186 species of Siphonaptera; 573 species of Lepidoptera; Diptera: 46 species of Culicidae and 166 species of Tipulidae, and 3,163 species of vascular plants, 570 species of mosses, 2,248 species of algae, 630 species of fungi, 1,069 species of lichens and 241 genera of microorganisms. To date, the "Biodiversity database" have already compiled and includes all data on vertebrates and invertebrates.

However, there were no targeted surveys or analysis on effectiveness and impact of these database use. It is presumed that both general public and decision makers use the database irregularly, but at

the same time scientific community and education sector people and people with special interest on certain subject matter benefit from these database greatly.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective

☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2016, the type, content and methods of data collection to report the state of biodiversity is defined;
➢ By 2018, tools to systematically integrate biodiversity values and benefits into the policy of print and broadcast agencies are defined.

Mongolia has established strong network of database that compile, process and share for wider public. However, there were no targeted surveys or analysis on effectiveness and impact of these database use. It is presumed that both general public and decision makers use the database rarely, while scientific community and education sector people and people with special interest on certain subject matter benefit from these database greatly.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Survey on the knowledge-attitude-practice of general public on Sustainable development and Green Development. (2018). ESD project, People Centered Conservation NGO. Ulaanbaatar

https://www.legalinfo.mn/annex/details/8620?lawid=13595

https://drive.google.com/file/d/1K4ccW4p7sFOwzXigw7DdrH_-9I5sQ13r/view

http://esd.mn/wp-content/uploads/2016/10/Base-line-report_Mon.pdf.

http://www.icc.mn

http://irimhe.namem.gov.mn

https://igg.ac.mn

http://portal.igg.ac.mn

http://eic.mn

STRATEGY 2. DEVELOP AND IMPLEMENT SCIENCE BASED POLICY ON CONSERVATION AND SUSTAINABLE USE OF BIOLOGICAL RESOURCES

Goal 3. Create a legal environment for the protection, sustainable use, and fair and equitable sharing of benefits arising from widely used and economically significant genetic resources, and to implement sustainable use, and protection from genetic erosion and depletion.

Objective 5. Register and protect genetic funds of Mongolian livestock, cultivars and specimens of endemic and crop plants and their wild relative species.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Mongolia is in the process of formulating the Law on Genetic Resources that would address identification, recording, use, protection and storing all of the information associated with genetic resources of animals, plants and micro-organisms within the territory of Mongolia. The law will also regulate relations related to their ownership and the establishment of a national genetic fund. Since 2017, this exercise is being supported by the UNDP funded project titled "Strengthening Human Resources, Legal Frameworks, and Institutional Capacities to Implement the Nagoya Protocol". The project aims to i) developing National ABS legal frameworks; ii) enhancing capacities of national and state competent authorities, related agencies, academic and research institutions and other stakeholders including private sector and local communities; iii) supporting institutional framework for sui generis systems for protecting traditional knowledge; iv) improving mechanism that facilitate ABS Clearing House; and, v) raising awareness on the importance of genetic resources as source of innovation. Thus the project will build strong foundation for identification, registration, preservation and use genetic resources including domestic animal breeds, strains, native and crop plant varieties and their wild relatives within the territory of Mongolia.

Review of declarations submitted to the Customs Office for the export of for period of 2012-2017 showed that over 1450 permissions were given to academic institutions and private sector for export of natural plants, animals and micro-organisms. The economic value of animals, plants and microorganisms exported across the border could be tens of millions of dollars as Mongolia does not track what products are produced and sold using these genetic resources. At the same time, the study commissioned by MET with support from UNDP titled "The future trend of Genetic resources use in Mongolia and economic benefits of it" suggest that Mongolia has the potential to benefit from MNT 2.5 trillion (~USD 1bln) from genetic resources from the use of genetic resources in the fields of agriculture, processing, health and biotechnology alone.

From these point of view, Mongolia possess genetic and biological resources that can be measured in a trillions of dollars. Therefore, research and genetic resources use in Mongolia needs to take into account the economic application of the genetic resources complied with international requirements and standards.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2017, feasibility study for legislation of genetic resource is conducted; and
➢ By 2020, rules and regulations on performing research on the genetic fund, collection and processing traditional knowledge and manufacturing and sustainable use of products is adopted; thus, creating an integrated authority on these activities.

In 2017, Mongolia started a project titled "Strengthening Human Resources, Legal Frameworks, and Institutional Capacities to Implement the Nagoya Protocol" that aims to build strong foundation for identification, registration and preservation of domestic animal breeds, strains, native and crop plant varieties and register their wild relatives within the territory of Mongolia.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).
http://www.mn.undp.org/content/mongolia/en/home/projects/strengthening-human-resources--legal-frameworks--and-institution.html

www.facebook.com/undp.abs.mn

https://www.legalinfo.mn/law/details/13051

Goal 3. Create a legal environment for the protection, sustainable use, and fair and equitable sharing of benefits arising from widely used and economically significant genetic resources, and to implement sustainable use, and protection from genetic erosion and depletion.

Objective 6. Register genetic resources and GMO and create a genetic resource bank.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Mongolia as a Party of the Nagoya Protocol, has entered two of the eight sets of data into the Nagoya Protocol on the Integrated Information Exchange System, and the remaining information is to be submitted after the enactment of Law on Genetic Resources and its supporting by-laws are developed. It is also working on the development of a web based national information exchange system under the "Strengthening Human Resources, Legal Frameworks, and Institutional Capacities to Implement the Nagoya Protocol" project. The website will contains the following information:

- o Introduction to the Nagoya protocol
- o Law on Genetic Resources
- o By-laws supporting implementation of the Law Genetic Resources
- o Introduction to the National Coordinator
- o Introduction to a National Authority

- o   Information on the value of the genetic resources
- o   Information about the value of traditional knowledge related to genetic resources
- o   Links to traditional knowledge database related to genetic resources.

Based on current published information, Mongolia's potential genetic resources were identified included in the database that contains information on biological and ecological information of the plants, animals and micro-organisms, as well as the traditional knowledge used and protected (Table 2). Broad group of users including decision makers, researchers, private sector, non-governmental organizations, local communities and intellectual property experts etc. have differentiated access to this database. Currently, the database contains the following information:

- 212 types of animal parts used for traditional medicine, 53 types of animal parts used for production and 2 types of animal parts used in agriculture.
- 561 plant species from 276 genera also included for its use in 558 types traditional medicine, 90 type of use in traditional nomadic livelihoods and 50 types of food.
- Microorganism database currently have information on 53 strains of microorganisms. These microorganisms were extracted from soil, plant roots, traditional dairy products, various yeasts (e.g. bread yeasts), wild berries and fruits grown in Mongolia, disease carrier rodents and pests, stomachs and gastrointestinal tract of young animals, and crude oil.
- In agricultural sector 127 traditional knowledge were registered, of which 63.0% is in the area of fodder preparation, 23.6% in food processing, 12.6% in artisanal garment making and handicrafts and 0.8% is in the area of fertilizer production.
- Mongolian scientists have identified the over 11,000 recipes used in the traditional medicine. Of those, some 200 most important for traditional medicines were selected and plant and animal derivate components of each recipe were fully studied. These 200 traditional medicines use over 300 medicinal plants and around 100 animal derivate, of which 150 plants are internationally recognized.

Table 2. Content of the Genetic Resources database (as of 2018)

Taxonomic classification/ Sector	Number of species	Traditional knowledge/application cases				
		Medicine	Agriculture	Processing	Food	Household
Animal	102	212	2	53		
Plants	561	558			50	90
Microorganisms	53					
Agriculture sector	127		127			
Pharmacology	11000	11000				

Source: UNDP-GEF project: Strengthening Human Resources, Legal Frameworks, and Institutional Capacities to Implement the Nagoya Protocol, 2018

The Plant and Agricultural Science Research Institute in Darkhan-Uul province has worked many years on the collection and storage of genetic resources for crop plants. Currently, the institute's Gene bank stores and uses seed material of 20,500 varieties from 70 different crops, seed materials of 1300 medicinal and useful plants with 245 varieties and also keeps 135 varieties of 70 crops in experimental fields.

"Strengthening Human Resources, Legal Frameworks, and Institutional Capacities to Implement the Nagoya Protocol" project has set up a media team comprised 20 journalists from the main press in Mongolia to increase public participation in public awareness of the genetic resources and public awareness of the demands of the legal environment. A Facebook (www.facebook.com/undp.abs.mn) is also set up to reach out general public and the target group and provide a technical and policy issues around genetic resources and to share information on project implementation.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2018, knowledge and experience of registering genetic resource, GMO and database establishment is created.

To date the full-fledged genetic resources and GMOs database has not been created. However, based on published information, Mongolia's potential genetic resources have been identified and included in database. The database has records of 102 animal species, 561 plants and 53 microorganisms that are used for pharmacology, agriculture, food, processing industry and household use. In parallel, the Plant and Agricultural Science Research Institute's Gene bank has seed material of 20,500 varieties from 70 different crops, seed materials of 1300 medicinal and useful plants with 245 varieties.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/536

www.facebook.com/undp.abs.mn

http://www.mn.undp.org/content/mongolia/en/home/projects/strengthening-human-resources--legal-frameworks--and-institution.html

Bayarsukh, N. (2015). Strengthening the conservation and sustainable use of plant genetic resources for food and agriculture in Mongolia. Journal of agricultural sciences №15 (02) pp. 173-179

Narantsetseg, Ya. Namjilsuren, J. Ayursaikhan, T. Research on Genetic Resources of Food and Agriculture of Mongolia

Ochgerel, N. Enkhtuya, L. (2019). Collection of genes of herbaceous herbs and plants. Ulaanbaatar, Mongolia. pp. 1-272.

Goal 3. Create a legal environment for the protection, sustainable use, and fair and equitable sharing of benefits arising from widely used and economically significant genetic resources, and to implement sustainable use, and protection from genetic erosion and depletion.

Objective 7. Create a legal environment enabling the sustainable use and fair and equitable sharing of benefits arising from genetic resources.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Mongolia's "Sustainable Development Concepts-2030", "Green Development Policy" approved by the State Great Khural, "National Guidelines for Developing Legislation" until 2020, Government

Action Program 2016-2020 and National Biodiversity Action Plan (2015-2025) stipulated creating legal environment on genetic resources and related knowledge.

In this connection, the Ministry of Environment and Tourism has set up a working group to formulate a Law on Genetic Resources. On February 02, 2018, the Ministry had a meeting with the working group and agreed in principle the finding and roadmaps on draft law, justification for needs and requirements based on international best practices on genetic protection, monetary and non-monetary benefits of genetic resources, and the national guidelines and database on traditional knowledge related to genetic resources.

Box 4. Key elements of the proposed Law on Genetic Resources

Section 1 describes the objectives, scope, concepts, principles, genetic resources, ownership of traditional knowledge related genetic resources, as well as the rights, obligations and interactions of the State Administrative Body over the genetic resources. The law set the principle of fair and equitable sharing of the benefits and benefits of using genetic resources and the protection of rights and benefits of local communities traditional knowledge related to genetic resources.

Section 2 regulates the coordination of unified database of genetic resources and related traditional knowledge information, protection of genetic resources, the protection of traditional knowledge, and the establishment of a gene fund. The establishment of a unified database will be of great importance to the nation as a whole for the identification, registration and monitoring of genetic resources and related knowledge and identification of genetic pool reserves and planning for future measures.

Section 3 regulates use of genetic resources and related traditional knowledge, including requirements for legal entities or legal entities from foreign legal persons to for using genetic resources and the use of traditional knowledge, requirements for prior notification to traditional knowledge holders, requirements ownership of state-owned genetic resources and traditional knowledge as well as acquisition and commercial use of genetic resources. The section also regulates the cash and non-cash benefit sharing from the use of genetic resources and related traditional knowledge.

Section 4 regulates the reporting on the use of genetic resources and related traditional knowledge and liability for violators.

The Law on Genetic Resources will regulate all aspects of genetic resources management notably the study, registration, maintenance, protection and utilization of genetic resources and related knowledge within the territory of Mongolia and ensuring the fair and equitable sharing of benefits resulting from their use. In other words, this law regulates genetic resources derived from plants, animals and any micro-organisms, and related traditional knowledge related to them, other than animal and agricultural crops.

In parallel to the Law on Genetic Resources formulation process, the Law on Livestock Genetic Resources was approved by Parliament on December 14, 2017. This Law replaced the previously put in force Law on Protecting Livestock Genepool and Health and reflects global development trends and concepts of livestock genetic resources and emerging needs for protecting genetic resources of the livestock.

The adoption of the Law on Genetic Resources for Livestock enables the food security of population with sustainable livestock based products, supply of high quality livestock raw materials to the national processing industry, maintaining the competitiveness of the livestock industry and ensuring ecological balance thanks to better management and use of livestock genetic resources. It also creates enabling environment for improving and developing existing and new breeds with better productivity, livestock nutrition, animal husbandry technology and controlling export and import of animal genetic resources including alien species invasion. A clear definition of rights and obligations of stakeholders in the Law also streamlines use, research and protection of genetic resources of livestock at national level and enables Mongolia in fulfilling its obligations under international treaties.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2017, situation analysis on legal environment of genetic resources is undertaken.

The Law on Genetic Resources of Livestock is enacted in 2017, thus establishing a legal basis for Mongolia to define the national identification, use, research and development of livestock genetic resources.

The Law on Genetic Resources is in the process of development and it will regulate the study, registration, conservation, protection and utilization of genetic resources and related knowledge within the territory of Mongolia and ensuring the fair and equitable sharing of benefits resulting from their use.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/536

www.facebook.com/undp.abs.mn

http://www.mn.undp.org/content/mongolia/en/home/projects/strengthening-human-resources--legal-frameworks--and-institution.html

Ochgerel, N. Enkhtuya, L. (2019). Collection of genes of herbaceous herbs and plants. Ulaanbaatar, Mongolia. pp. 272.

Goal 4. The national programs on conservation of rare and endangered animal and plant species is fully implemented.

Objective 8. Develop and implement a program on integrated conservation of rare and endangered species.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

The "National Program for the Protection of the Rare and Threatened Species" approved by the Government Resolution # 277 of 2011 presents a wide range of intervention with regards to the rare and endangered species. The Program has five interrelated objectives that aims to ensure that the ecological balance is maintained and prevents rare and threatened species' population decline and to create favorable environment for natural recovery of species, conservation of nucleus population and its increase in numbers and areas as well as captive breeding.

The Law on Fauna of Mongolia which defines Very Rare (synonymous to Critically Endangered IUCN classification) and Rare (synonymous to Endangered in IUCN classification) wildlife, listed 31

> Box 5. Objectives of the National Program for the Protection of the Rare and Endangered Species
>
> *Objective 1.* Improve the legal and economic framework to prevent the decline of rare and endangered species population and habitat degradation and secure their natural recovery/growth;
>
> *Objective 2.* Create Protected Areas network and improve its management covering rare and endangered species distribution area to ensure conservation of these species in their natural habitats and natural recovery/growth;
>
> *Objective 3.* To adopt and use advanced technologies for reintroduction, captive breeding, genepool preservation of globally and nationally endangered species to secure sustainable increase endangered species population;
>
> *Objective 4.* Implement inter-sectoral coordination policy to protect rare and endangered species for climate change, natural resources depletion and environmental pollution;
>
> *Objective 5.* Conduct comprehensive research on rare and endangered species to address the current needs and create conditions for introducing scientific and technological advancement, and streamline the public on awareness education on endangered species.

species and sub-species of mammals, birds and fish as Very Rare (Critically Endangered) in Mongolia However, the above-mentioned law and subsequent by-law that listed 14 species of mammals, 2 species of fish, 2 species of clay fish, 4 species of mollusks and 20 species of insects as Rare (Endangered) species have inaccuracies in the scientific names of the species and subspecies causing potential confusions and conflicts in conservation efforts. Therefore, it is necessary to correct these inaccuracies before updating the National Programme.

The National Program for the protection of Threatened Species has not been evaluated at programme level since its enactment. In 2018, the MET assessed the national programme performance around 80% (86% for Objective 1, 85% for Objective 2 and 87%, 72% and 70% for Objectives 3, 4 and 5 respectively). However, conservation interventions of Critically Endangered and Endangered species are based on information available before 2011, i.e., data available before enactment of National

programme. The surveys conducted last 20 years, assessed that Mongolia has over 28 Gobi bear at minimum, about 500 Brown bears, around 6500 Musk deer, 300 Asian beaver, 100 Eorasian otter, 3500 Beech marten, 900-1200 Snow leopards, 649 Takhi, 10000 Red deer, 10000 Khulan, 11000 Ibex, 13000 Argali sheep, 16400 Siberian moose, 800-1200 Wild bactrian camel, 140-200 Reindeer, 12000 Black-tailed gazelles, 35000 wild boar and about 4000 Mongolian saiga and about 3 million Mongolian gazelle (Report of State of the Mongolian Environment, 2017-2018.). The updated National Program requires reflection of these new population assessments as well as national and international regulatory environment and drivers impacting these species and their habitats.

Despite these shortcomings a number of interventions were carried out with support from the GIZ and WWF to improve legal environment to address the gaps and eliminate overlapping and inconsistencies in Law on Fauna and related laws as well as improve the international trade of endangered species and their derivate. The establishment of "the National Biodiversity Taxonomy Committee" that aims coordinate and provide advices on taxonomy of Mongolia's biodiversity, registration of new and endangered species, their status and recommendations on interventions for conservation and sustainable management of endangered species, is considered an important step for streamlining the conservation efforts for endangered species in Mongolia.

Between 2015, several works were carried out on Argali sheep, Takhi horse, Red deer and Siberian ibex re-introduction and relocation to improve genetic diversity of these endangered species. Eight individuals of Takhi horse were brought from the Praha zoo in June 2017 and 2018 and released Great Gobi SPA-B.

The trophy hunting of rare species is continued to practice to secure sustainable management of these species in the designated hunting reserve areas that are managed either by local communities or by specialized hunting companies in accordance with the Law on Fauna. In 2018, quotas for 81 Argali ram, 38 Red deer, 92 Siberian ibex hunting and 490 Taimen fish catch-and-release were approved based on the game management plans of the hunting reserves.

The amount of funds spent on the implementation of the National Program for the Threatened Species is unclear except the records from 60 hunting reserves that have spent MNT300 million (~USD120,000) for population assessment research and MNT1.5 billion investment in the hunting reserve management and implementation of their management plans during 2014-2016.

Mongolia's flora includes 151 endemic species belonging to 64 genera from 25 families. Of those species, 8 species listed as Very Rare, 27 species as Rare, 3 species as Relict species and 20 species are included in the Red book and 8 species are included in Red List.

Table 3. Red list status of vascular plants in Mongolia

Red List Category	Number species assessed in 1st edition (2012)	Number species assessed in 2nd edition (2019)
Critically Endangered (CR)	16	31
Endangered (EN)	39	109
Vulnerable (VU)	55	164
Near Threatened (NT)	22	79
Least Concern(LC)	10	42
Data Deficient (DD)	4	60

Not Applicable (NA)	2	5
Total	**148**	**490**

As a part of the MET work on establishment of "Biodiversity Database" of Mongolia, during 2017-2018, researchers and experts from National University of Mongolia, Mongolian Academy of Sciences and other universities and NGOs have created database for 471 plants that include medicinal and some of the endemic plants with description on their morphology, habitat, distribution, protection status, application and harvesting technologies.

Despite the alarming trend in Mongolia's vascular plant status (table 3) a "National Program on Natural/Wild Flora Conservation" that aimed to, inter alia, conservation and sustainable management of rare and endangered floral species, which was first drafted in 2015, has not been approved so far.

In 2018, a draft revision for Law on Flora was prepared and discussed among sectoral scientists and researchers and is in the process of further refining and consolidation. The adoption of a revised Law on Flora will result in improved policy on conservation of natural flora and their diversity, rational use and restoration of floral resources.

In 2013, Minister of Environment and Green Development and Minister for Transportation has issued a joint directive A-192/145 to establish a joint task force mandated to advise, and work on the improvement of legal environment, standards and norms to minimize adverse impacts on roads, transport and transportation to environment, wildlife and its habitats and migratory routes wildlife. As a result of their work, Mongolia became the first country in Central Asia that has a mandatory standard for "Wildlife passages along the railway and auto roads in steppe and Gobi Desert zone". This initiative was further deepened, and in 2018, mandatory standard for "Wildlife passages along the auto roads road infrastructure in mountainous area" was developed with support of WWF and other stakeholders. These two standards enable Mongolia to have wildlife passages in their road network, which is expected to expand to meet the ever-increasing demands for infrastructure from Mining Industry.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2016, mid-term evaluation over the implementation of national programme on conservation of rare and endangered species is performed.

➢ By 2018, planning inter-sectoral coordination on the development of infrastructure for biodiversity, especially migratory species is strengthened.

National Program on Threatened Species has not been evaluated fully, although MET has assessed the implementation of the National programme at level of 80 percent (86% for Objective 1, 85% for Objective 2 and 87%, 72% and 70% for Objectives 3,4,5 respectively). Both financial and institutional mechanisms for effective implementation of the program are unclear and thus the implementation of the Program is irregular. Therefore, the National Taxonomy Committee of Animals, Plants and Microorganisms should co-organize with the relevant organizations and make the financing mechanisms optimal. The amount of funds spent on the implementation of the National Program for the Threatened Species is unclear except the records from 60 hunting reserves that are managed by private sector and CBOs.

The approval and enactment of mandatory standards "Wildlife passages along the railway and auto roads in steppe and Gobi desert zone" (2015) and "Wildlife passages along the auto roads road infrastructure in mountainous area" (2018) create enabling regulatory environment for making the railroad and auto road network be environmentally friendly especially for migratory species. In the future, it is necessary to ensure inter-sectoral coordination for application of standards and compliance monitoring.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/8670

https://eic.mn/flora

Байгалийн ургамлын тухай хуулийн шинэчилсэн найруулгын төсөл (2018). Байгаль орчин, аялал жуулчлалын яам.

Гомбобаатар, С. Мөнхзаяа, Б. Лхам, С. Даваасүрэн, П. (2018). Монгол орны амьтан, ургамлын аймаг, мөөг, бичил биетний ангилал зүйн бүртгэл, мэдээллийн сан бүрдүүлэх төслийн тайлан. Байгаль орчин, аялал жуулчлалын яам, Боловсрол, соёл, шинжлэх ухаан, спортын яам, Шинжлэх ухаан технологийн сан, Монгол улсын их сургууль, Монголын шувуу судлалын нийгэмлэг, Монголика хэвлэлийн газар. Улаанбаатар хот, Монгол улс.

Ургамал, М. (2017). Ургамлын аймгийн төлөв байдал, өөрчлөгдөл (1.1 бүлэг), Ургамлын олон янз байдлыг хамгаалах ба улаан данс (4.2 бүлэг). Монгол орны байгаль орчин" (I-V боть) бүтээлийн "Монгол орны биологийн олон янз байдал" III боть. БОАЖЯ. Улаанбаатар, Монгол улс. х.12-70, 257-267.

Ургамал, М. (2018). Монгол орны таримлжуулах шаардлагатай ургамлын төрөл зүйлүүд. (Зөвлөмж). Улаанбаатар, Монгол улс. х.1-16.

Ургамал, М. нар, (2019). Монгол орны ховор ургамлын Улаан данс ба хамгааллын төлөвлөгөө. Улаанбаатар, Монгол улс. (хэвлэлтэнд).

Report of State of the Mongolian Environment, 2017-2018. (2019). Ministry of Environment and Tourism. Ulaanbaatar.

Gombobaatar, S. Conaboy, N. Urgamal, M. Terbish, Kh. and Gantigmaa, Ch. (2019). Biodiversity in Mongolia. Global Biodiversity, Volume 1: Selected Countries in Asia. APPLE Academic Press. Canada. p.351-395.

Gombobaatar, S., Myagmarsuren, M., Conaboy, N., and Munkhjargal, M. (2014). The 5th National Report of Convention on Biological Diversity, Mongolia. Ministry of Environment and Tourism and Steppe Forward Programme, NUM. Ulaanbaatar, Mongolia. p. 1-142.

Goal 4. The national programs on conservation of threatened animal and plant species is fully implemented.

Objective 9. Carry out research on alien species spreading in Mongolia and undertake measures to prevent the spread of invasive species.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

The biodiversity conservation and prevention of natural resource depletion component of the National Security Concept, adopted by the State Great Hural, aims to create a system of prevention and control of biodiversity impacts from alien species of animals, plants and micro-organisms. In addition, under the Law on Fauna Mongolia and Law on Natural Flora, Mongolia is supposed to have by laws regulating use of alien species and regulation of permits for cultivation of alien plants, respectively. However, these follow-up by laws were never developed and enacted. The first ever compilation of alien invasive species were conducted in 2018 and the list includes 8 species from mammals, 24 species of fish, 40 species of insects, 10 species from arachnids and mites and 51 plant species. This information is also included in the Global Register of Introduced and Invasive Species (GRIIS) that presents validated and verified checklists (inventories) of introduced (alien) and invasive alien species at the country level (https://www.gbif.org/dataset/ca55b876-88ef-44a1-b752-c38977af7d2f).

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2018, a database for registering alien animal and plant species is created.

Under the Law on Fauna Mongolia and Law on Natural Flora, Mongolia is supposed to have by-laws regulating use of alien species and regulation of permits for cultivation of alien plants, respectively. However, follow-up by-laws were never developed and enacted.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Munkhnast, D., Chuluunjav, C., Urgamal, M., Pagad, S. and Wong, LJ. (2018). GRIIS Checklist of Introduced and Invasive Species - Mongolia. Version 2.2. Journal of Invasive Species Specialist Group ISSG. Checklist Dataset. https://www.gbif.org/dataset/ca55b876-88ef-44a1-b752-c38977af7d2f

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Goal 5. At least 30% of representatives from each main ecosystem and all patch and vulnerable to climate change ecosystems are included in to the National Protected Area network and their management is ensured.

Objective 10. Expand and strengthen PA network through integrating ecosystem representative areas into national and local land use management plans.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Mongolia had adopted the "Law on Special Protected Area" in 1995 and "Law on Buffer Zone of Special Protected Area" in 1997. Since their first enactment, the Law on Special Protected Area was amended 12 times and Law on Buffer Zone of Special Protected Area was amended once to align changes and adoption of other laws. However, none of these changes were originated from the Protected Area's (PA) point of view, hence the challenges and opportunities identified through different assessments such as sustainability of PAs, legal environment for PA funding and related recommendations, PA's contribution to GDP through Ecosystems services were not reflected in these amendments.

During 2014-2018, the working group consisting of all interested parties like a MET, international Development Agencies, NGOs and scientific communities have prepared a draft revision of the Law on Special Protected Area and had organized stakeholder consultations. The proposed revision reflects findings and recommendation accrued on the PA and its management in Mongolia as well as recent international best experiences, trends, approaches and terminologies on PA and its management. Notably, the revision propose formalization of corridors between PAs and their management, use of public private partnership (PPP) in PA management especially involvement of CBOs in full or partial management of PA and diversification of PA financing and partial delegation of financial management to PA Administration.

However, the draft revision submitted to the Ministry of Justice and Home Affairs on November 2018 was sent back to the working group for further refining.

In parallel to the law revision exercise, a number of by-laws that aims to regulate the PA entrance fee, research work inside PAs, pasture management inside PA, designation of Local Protected Area (LPA) and transfer of management responsibility of LPA to third-party were also drafted to enable smooth enactment of the proposed law.

In 2017, the Agency for Land Affairs, Geodesy and Cartography of Mongolia has issued a "Guidance on Designating Land for Special Use at Local Level". Nationwide implementation of this Guidance is already giving positive impact in reducing land related conflicts including the ones related to designation of LPA.

The resolution on "Capacity building measures for community's co-management capacity for natural resources" issued by the Parliament Standing Committee on Environment, Food and Agriculture in

2015 is playing important role for 177 CBOs that are located within PA or in its buffer zone. Some of these CBOs have piloting establishment of formal partnerships for buffer zone management, conservation interventions within the PAs.

The National Program on Special Protected Area was adopted by the Parliament in 1998 and in 1999 the Government has approved and commenced the implementation of the Plan of Action for the first phase of the National Program. The National Programme aimed to cover 30% of the key ecosystems under PA Network. This commitment was further reiterated in the Mongolia's Sustainable Development Vision for 2030 and included as one of the 20 core indicators of this important policy document.

In 2015, National Program was assessed by independent experts and concluded its implementation at level 65 percent. Based on the results of implementation of the National Program on Special PA and other relevant research and studies, the National Program on Special PA was revised during 2017-2018 and the third phase of the Plan of Action is proposed to make the PA Network of Mongolia reaching international standards and becoming the role model for sustainable development vision.

During 2008- 2017, Ministry of Environment and Tourism of Mongolia carried out with the support of key players, notably the TNC and WWF, the ecoregional level assessments and biodiversity hotspot's gap analysis, dividing the country into four major ecoregions. A total of 216 sites covering 434,153.97 sq.km areas (Figure 8) were identified and prioritized as areas to be included in the Country's PA Network by 2030 in three phases.
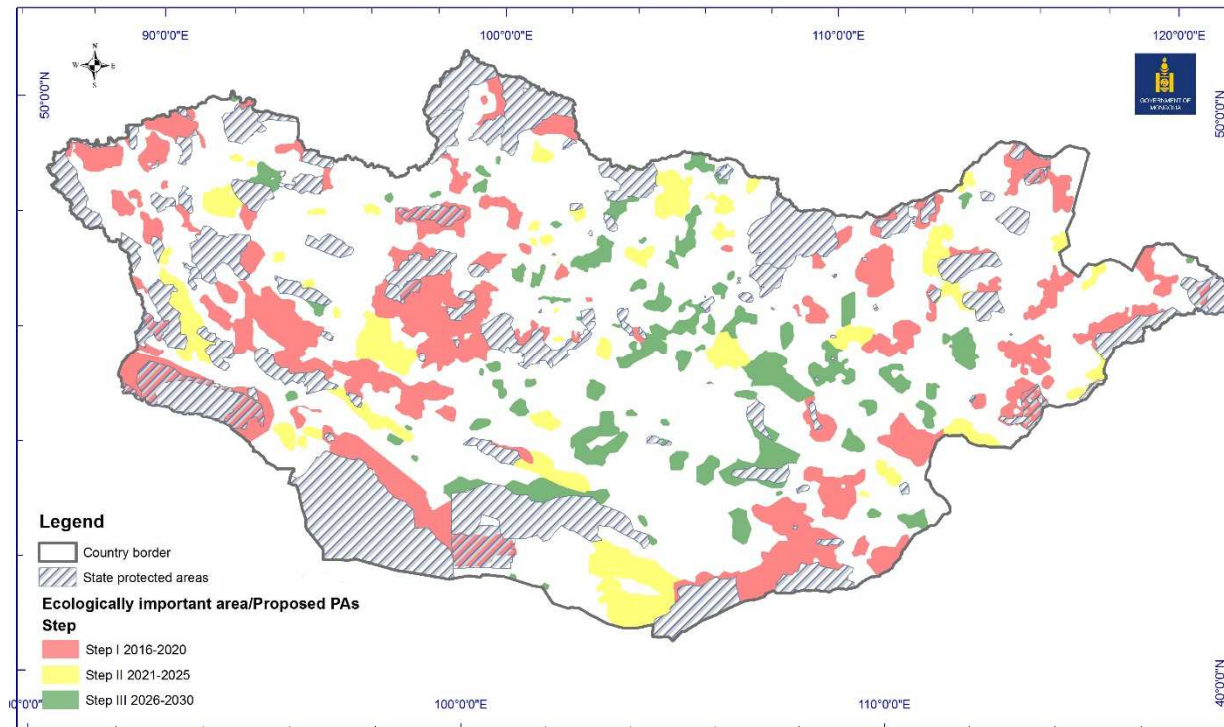
Source: Ministry of Environment and Tourism

Figure 8. Existing and Proposed Protected Areas of Mongolia

131 out of these 216 biodiversity hotspots were officially included as a proposed PA in the Master Plan for Land Management of Mongolia for 2019-2030, which was approved by The Government of Mongolia in December 2018.

During 2016-2019, Parliament of Mongolia has approved 18 new PAs and expanded 7 existing protected areas and increased the areas under PA Network by 4.4 million hectare. This increase makes the total number of PAs in Mongolia to 115 sites, of which 20 sites are gazetted as Strictly Protected Area (IUCN-Ia, Ib&II), 34 sites as National Parks (IUCN-Ib, II&V), 47 sites as Nature Reserve (IUCN-IV) and 14 sites as National Monuments (IUCN-III). As of September 2019, Mongolia has dedicated 30.27 million hectares area, which constitute 20.1 percent of the territory to State Protected Areas. It is expected that additional 1.33 million hectares of area will be added as soon as the Government define and enter into National Cadastre information the boundaries the 14 Nature Reserves and Natural Monuments, which were approved by the Parliament of Mongolia and tasked the Government to define the boundaries of the NRs.
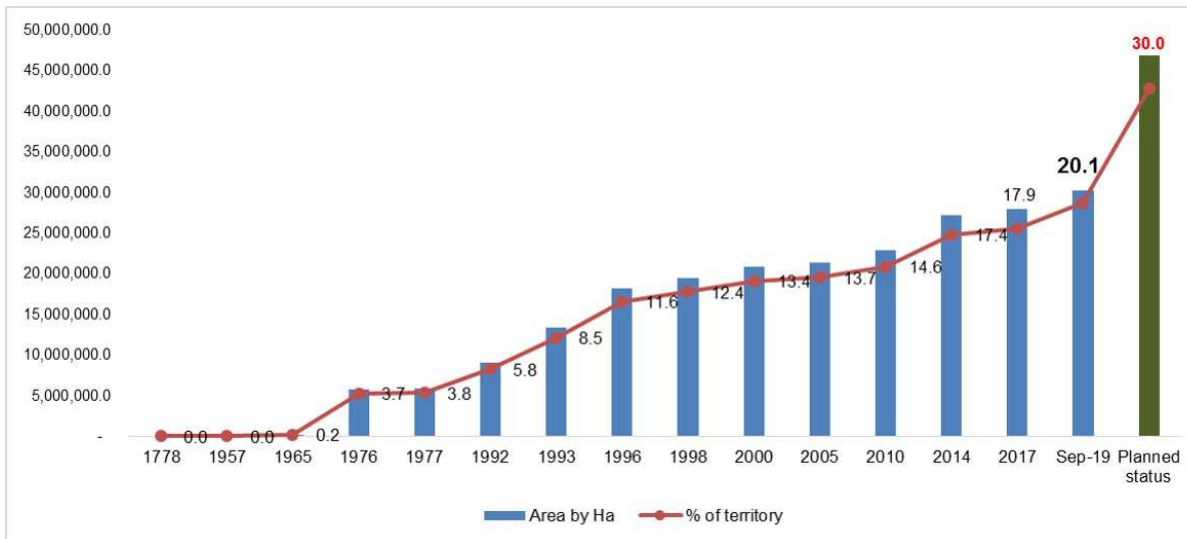
Source: Ministry of Environment and Tourism

Figure 9. Special Protected Areas of Mongolia

From the ecosystem representativeness point of view, Mongolia has reached its objective to protect 30 percent for all major ecosystems, except steppe ecosystem. As of 2019, only 8.5 percent of the steppe ecosystem is protected and half of the PAs in steppe region are at level of Nature Reserves i.e., IUCN category IV - Habitat/species management area that aims to protect particular species or habitats through traditional management approaches. In accordance with the Mongolian Law on Special Protected Area, the management and financing of Nature Reserves are delegated to the respective Local Government, which itself at large rely on subsidy from the Central Government.
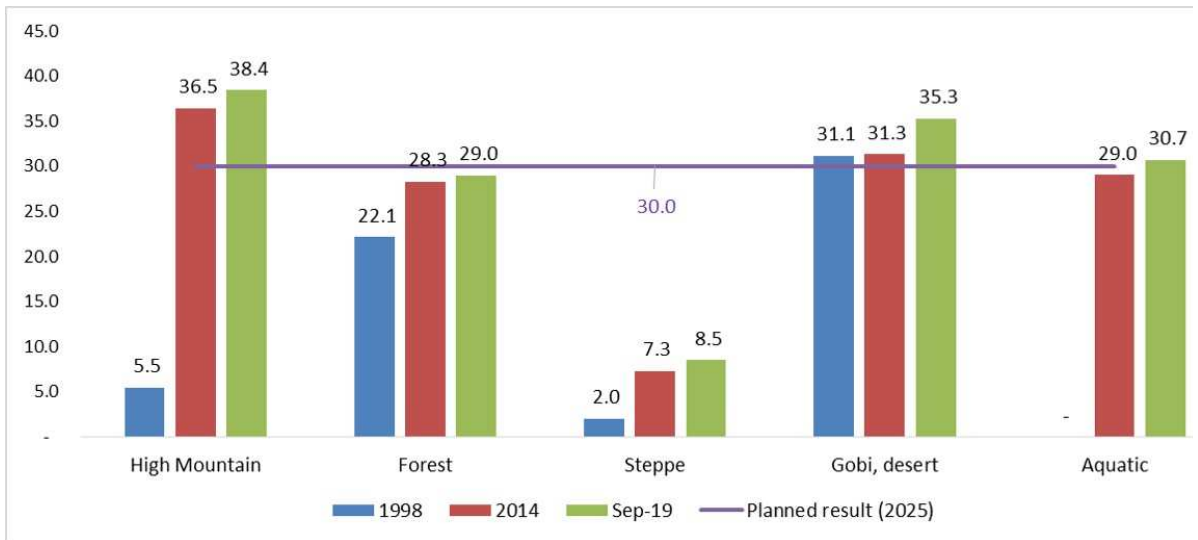
Source: Ministry of Environment and Tourism

Figure 10. Ecosystem coverage under State Protected area Network

In parallel, to designated Special (State) Protected Areas, the Local Parliaments at county and province level have designated some of their areas as a Local Protected Area. These LPAs are equal to IUCN category VI – Protected area with sustainable use of natural resources and unlike the state protected areas, the management, protection period and regimes are decided by the Local Parliament. As of February 2019, the Local Parliaments have officially designated 1118 sites covering 24.02 million hectares of land as LPA under status of locally designated Nature Reserve or Natural Monuments. The LPAs, thus, add additional 15.36% of the territory to the country's PA network.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2016, the legislation on sustainability of financial resources and collaborative management in PAs is established.

➢ By 2020, based on evaluation on implementation of national action plan for PAs, the program is revised and a mechanism is created to ensure representativeness of ecosystems, sustainable management and financial system.

A number studies were carried out and recommendations on revising the current Law on Special Protected Area, Law on Buffer Zone of Protected Area as well as National Programme on Special Protected Area. Although none of those revisions were materialized, the expansion and management of PAs have been adequately managed under the current legal environment.

Mongolia's goal of protecting 30 percent of its territory through the PA Network is accepted by all stakeholders in the country and have become one of the 20 core indicators of Mongolia's Sustainable Development Vision for 2030.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://cmcs.mrpam.gov.mn/cmcs.

https://www.legalinfo.mn/law/details/479?lawid=479

https://www.legalinfo.mn/law/details/478?lawid=478

Batjargal. Z and Shiirevdamba. Ts. (2016). Opportunities to expand Mongolian special protected area network. Ulaanbaatar.

Chimed-Ochir B., Herzman T., Batsaikhan N., Batbold D., Sanjmyatav D., Onon Yo. Munkhchuluun B. (2010). Filling the gaps to Protect the Biodiversity of Mongolia. WWF Mongolia Programme Office. Admon Printing House. Ulaanbaatar. pp. 136

Feasibility of concessions for tourism and ecosystem services in PAs of Mongolia. (2013). UNDP. Ulaanbaatar.

Heiner, M. et al. (2013). Identifying conservation priorities in the face of future development: Applying Development by Design in the Mongolian Gobi. TNC Mongolia program. Ulaanbaatar.

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Sustainable development vision-2030. (2016). Parliament of Mongolia. Ulaanbaatar

Valuation of Contribution of Ecosystem Services of the Protected areas of Mongolia to Sectoral Economic Development. (2015). UNDP. 2015Ulaanbaatar.

Goal 5. At least 30% of representatives from each main ecosystem and all patch and vulnerable to climate change ecosystems are included in to the National Protected Area network and their management is ensured.

Objective 11. Improve management and capacity of PAs in cooperation of all interested parties.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

The current PA management system was initiated by the establishment of a specialist in charge of State Protected Areas at the State Committee on Environmental Inspection in 1990. Today, this function is managed by a dedicated Department within MET – the Special Protected Areas Administration (SPAA) responsible for providing overall management, coordination, supervisions of Protected Areas through setting policy directions and implementation of respective laws and regulations on special protected areas as well as organize and coordinate the implementation of the program and project, expand the special protected area, and develop measures to improve the management of conservation and protection capacities of PA administrations. To date 34 Protected Area Administrations (PAA) operate under direct supervision of the SPAA and 30 of which are funded by the state budget and four protected areas are fully or partially managed by NGOs, or through public private partnership. These new management schemes for Khustai National Park managed by NGO with same name (since 1994), Ikh Nart Nature Reserve managed by NGO titled Centre for Argali and game management (since 2013) and Khar Yamaat Nature Reserve managed by WWF Mongolia Programme Office (since 2013) and Tost Toson Bumba Nature Reserve managed jointly by the Umnugobi Province Governor's Office and NGO Snow Leopard Trust (since 2017) show new opportunities for Mongolia to mobilize funding and technical capacities for different levels of PAs in Mongolia.

The PA Administration's standardized structure is set by the Minister of Environment and Green Development Directive A-06 of 4 January 2013 and size of areas designated per ranger is set by Government Directive 87 of 19 April 2006. However, in both cases minimum requirements are derived from the state budget availability and hence do not reflect actual needs of PA. As of 2018, the 30 PAAs financed from the state budget have employed547 people, of which 390 are rangers (Figure 11) and 25 percent of all employees are women.
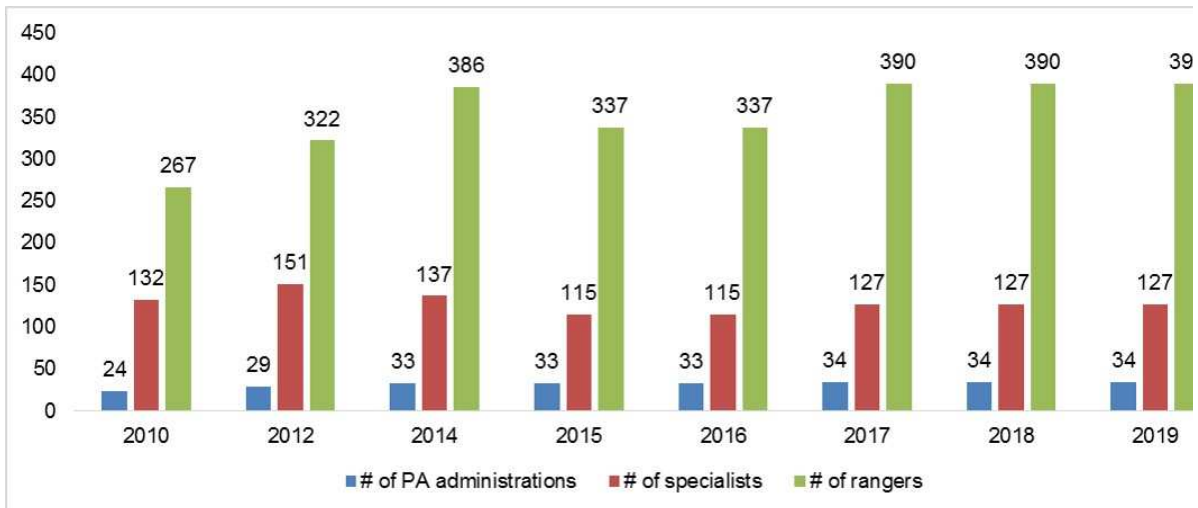
Figure 11. Trends in Protected Area Administration staffing

Despite these limitations, the Government has continued to focus on building capacities of the existing PAA staff. Since 2016, the rangers and specialists of the PAs are obliged to enrol online training and testing system. The results of these tests are reflected the staff annual performance review and salary scheme. The assessment of these online training show that much focuses are given to specialists and lesser extent to the rangers.

One of the limiting factors on capacity building of PA network and its specialists and rangers are considered almost stagnant state fund allocation to the PAs during the past four years (Figure 12.) despite the local currency depreciation and inflation rate higher that real GDP growth of the country). At the same time, PAA continue to send major revenues generated from PAs such as tourists' entrance fee (estimated at USD117,000 as of 2018) and land use fee (estimated at USD 7.6 million as of 2018) either to central or local budget.

In this environment international projects are programme are filling PA and PAAs' the capacity building needs. During 2015-2018, four international projects that focused capacity building for PA networks were implemented and starting from 2019, another 4 projects with total budget of USD 64.1 million are expected to support the PA networks in Mongolia.
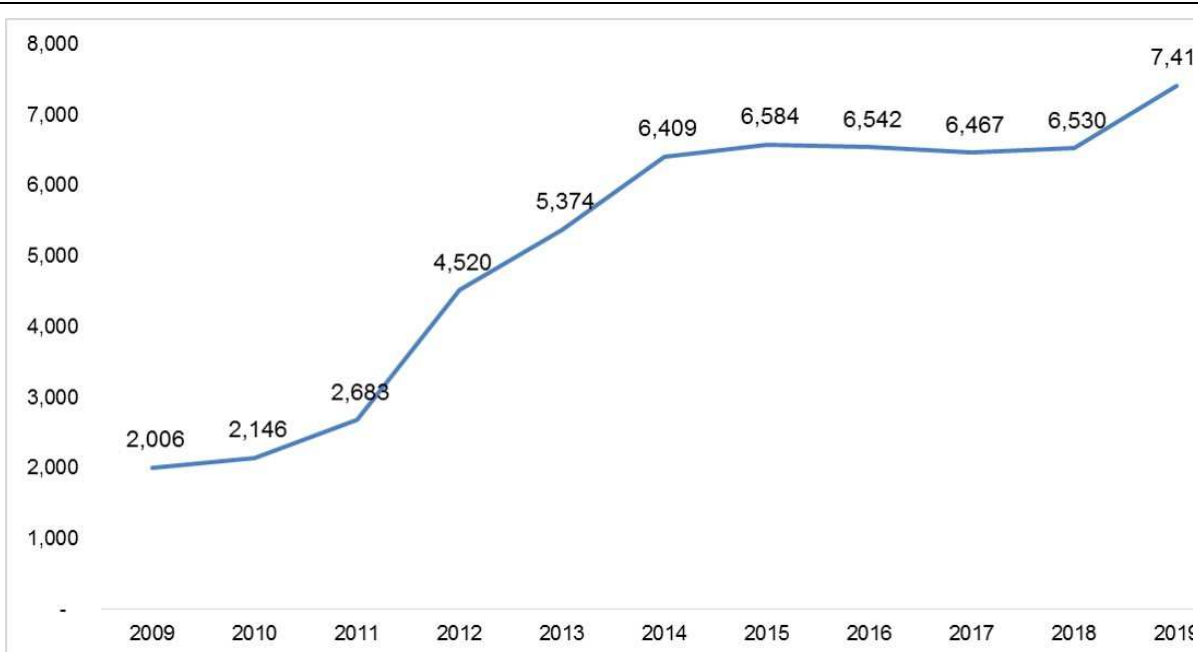
Source: Ministry of Environment and Tourism, 2019

Figure 12. State fund allocation to the Protected Areas (in million MNT)

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

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Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2018, an official document is in place to build capacity of PA administration staff.
➢ By 2020, the infrastructure and professional capacity of PA administrations is improved.

To date 34 PAAs operate under direct supervision of the SPAA and 30 of which are funded by the state budget and four protected areas are fully or partially managed by NGOs, or through public private partnership, thus expanding its approach for managing PAs. However, the staffing needs of PA set by the Government are driven by the state budget availability and hence do not reflect actual needs of protected area.

Although MET put into operation mandatory online training, capacity need at local level is not met due to limited budget available. To date, international project support continue to play major role in capacity of PA network in Mongolia

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.imf.org/en/Countries/MNG

Batjargal. Z and Shiirevdamba. Ts. (2016). *Opportunities to expand Mongolian special protected area network.* Ulaanbaatar.

Chimed-Ochir, B. Herzman, T. Batsaikhan, N. Batbold, D. Sanjmyatav, D. Onon, Yo. Munkhchuluun, B. (2010). Filling the gaps to Protect the Biodiversity of Mongolia. WWF Mongolia Programme Office. Admon Printing House. Ulaanbaatar. pp. 136

Feasibility of concessions for tourism and ecosystem services in PAs of Mongolia. 2013. UNDP. Ulaanbaatar.

Munkhchuluun B. (2018). *Management effectiveness of Protected areas.* Ulaanbaatar.

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Valuation of Contribution of Ecosystem Services of the Protected areas of Mongolia to Sectoral Economic Development. 2015. UNDP. Ulaanbaatar

Goal 5. At least 30% of representatives from each main ecosystem and all patch and vulnerable to climate change ecosystems are included in to the National Protected Area network and their management is ensured.

Objective 12. Develop and implement conservation plan on ecosystems that are patch or vulnerable to climate change.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

The Ecoregion Assessment, organized by TNC has detailed mapping of sensitive ecosystems to in all ecoregions of Mongolia and estimated that 9.5% of Mongolia's territory has patch or sensitive to climate change ecosystems. As of September 2019, 26.4% of these patch ecosystems or 3.9 million hectares of area were included in the existing PA Network. This is 439,408 hectares increase compared 2014, however, the actual protection of these patch ecosystems within large PA needs much more focused intervention. Climate change, which affects the patch ecosystem more drastically, has been identified as a major threat to the conservation targets and values in many of the PA management plans in Mongolia. For example, some species of amphibians and reptiles have been decreased from the original distribution area and also their distribution reduced due to climate change and human activities. The herpetologists have identified two patch areas as a key for the conservation of amphibian and reptile populations. These areas are Nogoon-tsav valley in Shine Jinst soum of

Bayankhongor province where one third of Mongolian reptile's species occurs, of which two are regionally threatened and Ikh and Baga Buureg in Shaamar soum of Selenge province where 66 % of Mongolian amphibian species, including regionally threatened salamander and tree frog are found.
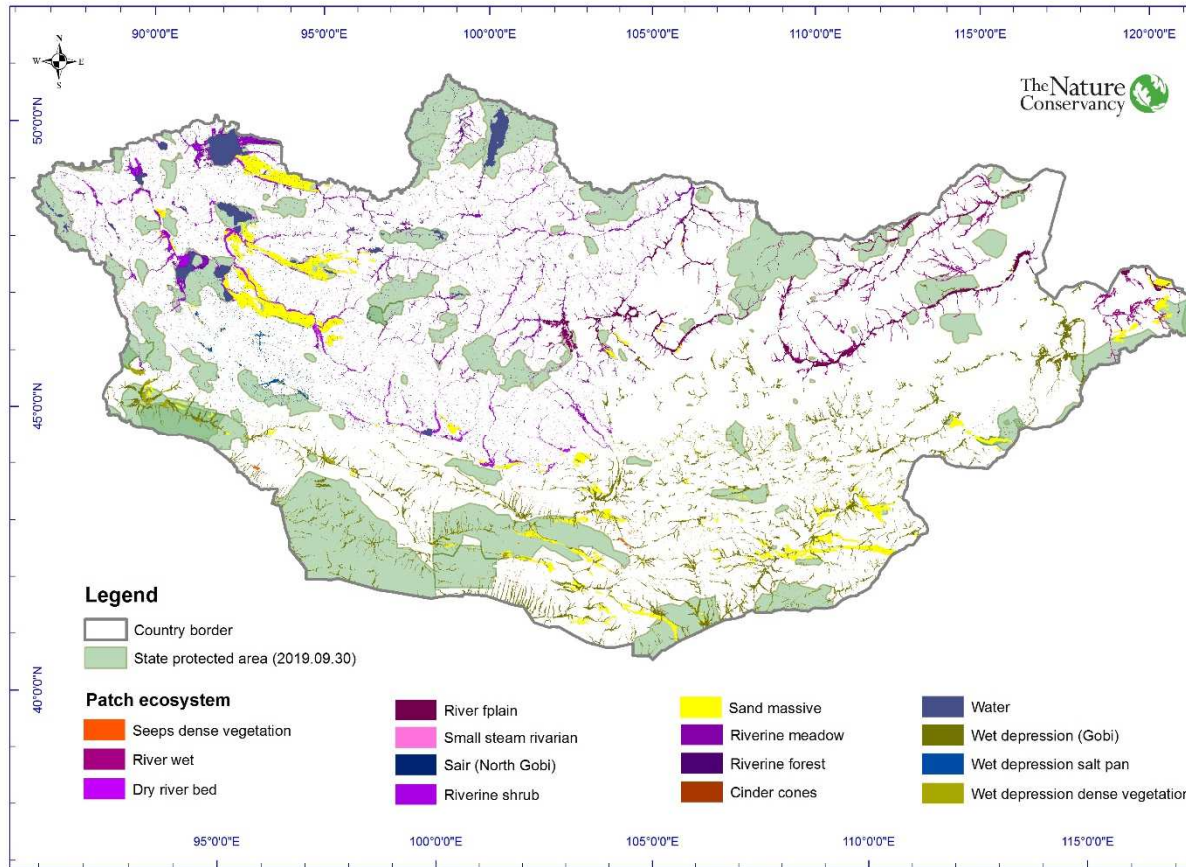
Source: TNC Mongolia Program, 2019

Figure 13. Patch ecosystems and their coverage under PA network

However, none of the PA management plans identified specific objectives and/or operational plans on CC adaptation, mitigation or resilience building for its conservation targets including on-site assessment and monitoring. This, however, been caused by the factor that Mongolia does not have targeted CC assessment reports or data for patch ecosystems because most of the CC adaptation, mitigation and resilience building related assessments and recommendations are built around iconic species such as Snow leopard, Argali sheep, Mongolian gazelle, Red deer and White-naped crane and their habitats.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

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☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➤ By 2017, a database of ecosystems that are unique patch or vulnerable to climate change is identified and created.
➤ By 2020, a conservation and sustainable use plan supporting the restoration of ecosystems that are ecologically, socially and economically important or that is patch and vulnerable to climate change is developed.

The Ecoregion Assessment, organized by TNC has detailed mapping of sensitive ecosystems to in all ecoregions of Mongolia and estimated that 9.5% of Mongolia's territory has patch or sensitive to climate change ecosystems. As of May 2019, 26.3% of these patch ecosystems or 3.9 million hectares of areas were included in the existing Protected Area networks.

However, due to lack of targeted studies on these patch ecosystems, none of the PA management plans have actions focused to mitigate CC impact to the patch ecosystems within their area.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Heiner, M. et al. (2017). Хангай, Хөвсгөлийн экологийн бүс нутгийн үнэлгээ. TNC Mongolia program. Ulaanbaatar.

Heiner, M. et al. (2017). Identifying Conservation priorities in the Face of Future Development, Applying Development by Design in the Western Mongolia: Mongol Alta Mountains, Great Lakes Depression and Lakes Valley. TNC Mongolia program. Ulaanbaatar.

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Kh. Munkhbayar & M. Munkhbaatar. (2012). Herpetological diversity of Mongolia and its conservation issues. Erforsch. biol. Ress. Mongolei (Halle/Saale) 2012 (12): 203–212.

Goal 6. Protect soil and water resources from chemical and nutrient pollution.

Objective 13. Enable cooperation with government and the general public in the monitoring of legal enforcement of laws regarding chemical pollution from urbanization, mining and manufacturing.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Mongolia has nine laws that specifically regulate effective use, protection, and restoration of water resources and water use fees and water supply. The 2004 Water Law initiated reassignment of many water functions from central to local government, with provincial and district governors being responsible for the matters related to use, protection, and restoration of water resources and first time introduced the IRBM concepts. The 2012 Water Law replaced the 2004 Water Law and introduced among others the mandates of state organizations that are in charge of development and adoption of integrated water resource management plans and introduced river basin organizations (RBOs) paving the way for decentralization of water management and facilitating involvement of citizens in water management.

Under the Water law 29 water basins were delineated and 21 River Basin Authority and River Basin Councils were established to prepare integrated water basin management plans for each river basin and to support implementation of these plans. To date 29 IWRM plans are already in place and approved by the Minister of Environment and Tourism.

One of major steps taken by these RBAs and Local governments are a delineation of a no-go zones along the river applying the Water Law provisions that set boundaries of limited and restricted use zones of along river bank. To date 5.2 million ha of riparian areas are delineated in western and eastern Mongolia with support of WWF Mongolia and approved as a no-go zone by the respective Local Parliaments under the Law on Water. All other River Basin Authorities are working with their respective government to set such zones in their respective areas.

The implementation of the Law on Water was supported by National Water Programme that aimed among others, include in the PA network the 80 percent of run-off forming areas of Mongolia by 2021 and minimize and halt any negatively impaction intervention in these areas.
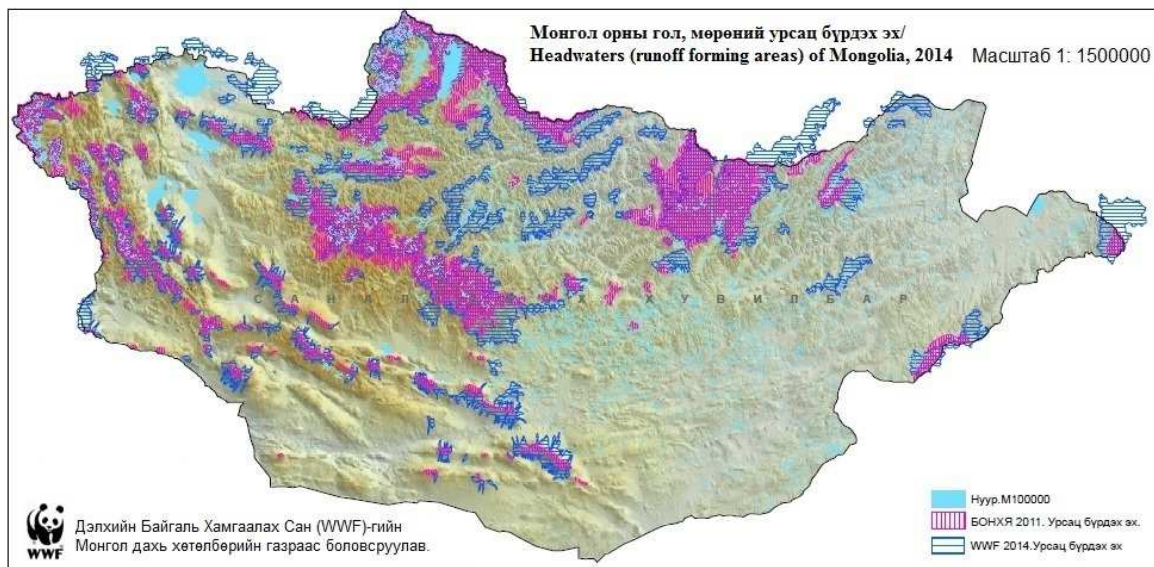
Source: WWF Mongolia, 2014

Figure 14. Head water (run-off forming area)

In 2015 the Ministry of Environment and Tourism has delineated 9.1 million ha run-off forming area in 29 River Basins (figure 14). As of 2018, 3.3 men ha run-off forming areas were already included into the PA network (MET 2019).

According to the Environmental Assessment of 2017-2018 the water body area of Mongolia is estimated 686.1 thousand hectares or 0.4% of the total land area. This includes 228.5 thousand

hectares or 33.3% in rivers, streams, 443.6 thousand hectares or 64.7% in lakes and ponds, 12.4 thousand hectares or 1.8% in streams and springs, 1.6 thousand hectares or glaciers in glaciers and glaciers.

The national network of surface water quality monitoring of Mongolia carry out chemicals and quality control in 191 point in 94 rivers, 18 lakes and disseminate the report.

The surface water quality monitoring report in these 191 points showed (table 4) that during 2013-2016, 91-95% of river and lakes reported as "very clean and clean", 3-5% as "slightly polluted", 0-1% as "polluted" and 3-4% are "very polluted". However, the 2018 survey showed 88.5% are "Very Clean and clean", 7.9% is "Slightly polluted", 2.1% as "Polluted" and for 1.6% as "Very polluted".

Table 4. Surface water quality change in (%)

Water Quality category	2013	2014	2015	2016	2017	2018
Very clean, clean	93,0	95	93	91	89,2	88,5
Slightly polluted	5	5	3	5	5,9	7,9
Polluted	0	0	0	1	1,6	2,1
Very Polluted	3.0	3	4	3	3,2	1,6

Source: State of the Mongolian Environment, 2015-2016 & 2017-2018.

The Tuul, Khangal and Khuder river basins are becoming the three most polluted river basin. The pollution of former two river basins are caused by insufficient capacities of waste water treatments plants of Ulaanbaatar and Erdenet cities, while pollution on Khuder river basin caused by the gold mining activities in the upper part of the river.

In Mongolia the environmental assessment, soil quality is determined at throughout the country at 340 points every 5 years using key parameters such as moisture, humus, sulphate (SO4), phosphate (P2O5), nitrate (NO3) and ammonium (NH4) and presence of heavy metals. In addition every 1-2 years samples are taken from the contaminated sites around central and local settlements and presence of 11 heavy metals such as lead (P), cadmium (Cd), mercury (Hg) and chromium (Cr) are checked. The values set by the Mongolian National Standard MNS 5850:2008 "Soil Quality. Soil Pollutants Elements and Substances" are applied for assessing the level of contamination.

According to these assessments carried out in 2014, 2016 and 2018 presence of cadmium, lead, mercury, bromine, chromium, zinc, copper, cobalt, strontium and chlorine were found in soil samples at 85 points in four districts of Ulaanbaatar and 85 sites in 21 provinces. In addition, the soil microbial pollution is found prevailing in cities caused by *ger* district latrines, while in rural areas pollution are mostly caused by the mining. The soils in provincial and county centres also affected by the unregulated solid wastes.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective

☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2018, implement integrated management of water resources, and particularly improve protection of areas with water resources and ensure enforcement of rules and procedures that follow.
➢ By 2020, ensure governmental and public cooperation in implementation monitoring of legislation concerning protection from urbanization, mining, and manufacturing related pollution.

Under the Water law 29 water basins were delineated and 21 River Basin Authority and River Basin Councils have prepared integrated water basin management (IWRM) plans for all 29 basins. Currently RBAs and Local governments are working closely on a delineation of a no-go zones along the river applying the Water Law provisions that set boundaries of limited and restricted use zones of along river bank. To date 5.2 million ha of riparian areas are delineated and approved as a no-go zone by the respective Local Parliaments under the Law on Water.

The national network of surface water quality monitoring of Mongolia carry out chemicals and quality control in 191 point in 94 rivers, 18 lakes and disseminate the report.

In Mongolia the soil quality is assessed throughout the country at 340 points every 5 years and using key parameters such as moisture, humus, sulphate (SO_4), phosphate (P_2O_5), nitrate (NO_3) and ammonium (NH_4) and presence of heavy metals. In addition every 1-2 years samples are taken from the contaminated sites around central and local settlements to assess presence of 11 heavy metals. The values set by the Mongolian National Standard MNS 5850:2008 "Soil Quality. Soil Pollutants Elements and Substances" are applied for assessing the level of contamination.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Mongolia National Program on Reduction of Air and Environmental Pollution (2017). Attachment to the Government Resolution # 98 of 2017.

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Mongolia Water Security Assessment. (2017). ADB TA 8855: Country Water Security Assessment. Mongolia Water Forum Uskhelts. Mongolia. pp. 121

Goal 6. Protect soil and water resources from chemical and nutrient pollution

Objective 14. Increase public awareness on direct and indirect effects on biodiversity by chemical substances used in agriculture.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

On a national scale, Mongolia does have sufficient water by volume and quality to support its population and economic developments. On a local scale, however, serious water challenges which can threaten economic and social development in the country can be found in the urban and economic hub of Ulaanbaatar and Mongolia's mining hub in the Southern Gobi region.

At the same time only 50% of herder population have access to improved safe water sanitation facilities. Most herders use dug wells and open water sources. Sanitation facilities are minimal due to movement of herder camps. Improving household security in rural areas is difficult, due to dispersed and temporary nature of camps. Summer *gers* use river water, facing issues of permafrost in some areas such as Khuvsgul, Altai and Khangai rarion. Government has been providing deep wells for livestock, which also provide some benefit to herder families, but there is no specific program to meet the needs of potable WSS for herder families in pasture camps.

According to the 2018 census, Mongolia has reached the highest number of livestock in its history with a total estimate of 66.4 million animals, over to 106 million heads/unit of sheep. The number of livestock has significantly increased in recent years, due to government subsidies for wool production.

Large increase in stocking numbers is also due to opening of new grazing lands from construction of new water points.

> Box 6. 432,000 ha areas claimed for livestock or claimed from wildlife?
>
> In 2017, the Government had allocated around USD 760,000 to support deep well drilling in rural areas and pastureland. Some 288 deep wells were installed with this investment opening up 432 thousand hectares of previously inaccessible to livestock rangeland and 1400 herder households have become direct beneficiary of it.

The carrying capacity of Mongolian pastures has been greatly exceeded in many areas, and overgrazing is a primary factor explaining rangeland degradation observed in Mongolia.

The overgrazing problem exists around traditional and constructed water sources. Climate change projections indicate that increased frequency of drought and overgrazing of pastures will worsen the situation and will leave most soils fragile by 2030. Complexity of the livestock sector necessitates balancing economic returns from investing in water points and risks of irrecoverable long-term degradation of pasturelands caused by uncoordinated development of water points.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☐ Measure taken has been partially effective
☒ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2018, improve management of water supply for rural household use and pastureland.
➢ By 2020, increase herders and farmers' awareness and users' knowledge on the direct and indirect effects on biodiversity by chemical substances used in agriculture.

Despite the sufficient water by volume and quality to support its population and economic developments at the national scale, sustainable water supply for herder and livestock sector has not been addressed properly. Opening new water points that improved herders' water supply had also enabled them to further increase livestock and exacerbate land degradation in the country.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

From vulnerability to sustainability: Environment and Human Development. (2011) NHDR 2011. Government of Mongolia, UNDP, SIDA. Ulaanbaatar. pp. 46-66

Mongolia Water Security Assessment. (2017). ADB TA 8855: Country Water Security Assessment. Mongolia Water Forum Uskhelts. Mongolia. pp. 121

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Targeted Analysis on Water Resources Management Issues in Mongolia, Final report. (2014). 2030 Water Resources Group. PricewaterhouseCoopers Private Limited. Gurgaon, India. pp. 48

Goal 6. Protect soil and water resources from chemical and nutrient pollution

Objective 15. Create a monitoring mechanism for sustainable use of plant pesticides and fertilizers.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Use of pesticides in Mongolia in Mongolia is regulated by the Law on toxic and hazardous substances (2006) that regulate import, export, re-export, trade and disposal issues and Law on Plant Protection (2007) that further elaborate on right and obligation of certified body for handling pesticides, control over use of pesticides, including the testing of new pesticides.

According to these legislation, the list of agro-chemicals that could be used in Mongolia is approved by the joint directive of Minister for Health (MoH), Minister for Food, Agriculture and Light Industry (MoFALI) and Minister for Environment of Tourism (MET). The annual quota on importable amount of agrochemicals is prepared by the MoFALI and approved by MET.

During 1990s use of agrochemicals went almost zero due to collapse of the sector.

In 2008, the Government introduced a "3rd Campaign on Virgin Land" program, which enabled the farmers to buy discounted seeds, fertilizers, plant protection chemicals as well as discounted loan for new agricultural machineries. As part of the campaign programme the Government also start paying premium around USD40 for every tons of wheat sold to the flour mills. This incentive mechanism

aimed to self-sufficiencies in wheat is having inductive impacts on farmers to increase use of agro-chemicals as shown in table 5.

Table 5. Trends in agro-chemicals import

Imported agro-chemicals	unit	2014	2015	2016	2017	2018
Fungicides	tons	-	9,0	4,8	8,49	45,7
Herbicides	tons	330,0	425,5	673.0	476,8	1313,2
Insecticides	tons	-	-	-	-	87,3
Rodenticides	tons	-	-	-	-	7,2
Compound Fertilizer (NPK)	tons	215,0	998,9	7900,0	3040,0	11812,0
Total arable land	Thousand ha	924,32	1028,2	1067,7	1327,8	1329,0

Source: Ministry of Food, Agriculture and Light Industry, 2019

At the same time, rate of fertilizers applied in Mongolian agriculture sector as of 2018 is estimated at 8.9 kgs/ha, which is negligible if compared to any other countries. Similar pictures can be seen with regards to application of pesticides, of which highest amount goes to herbicides applied at rate of 0.98 kg/ha hectare, while internet data show that other states like China and OECD countries annual application rate goes at 5.8kg/ha and 5.5 kg/ha respectively.

Table 6. Amount of agro-chemicals applied per unit hectares of farmland

Agrochemical types	2014	2015	2016	2017	2018
Fungicides		0,009	0,0046	0,0064	0,034
Herbicides	0,35	0,41	0,63	0,36	0,98
Insecticides					0,065
Fertilizer	0,23	0,97	7,3	2,29	8,9

Source: Ministry of Food, Agriculture and Light Industry, 2019

In 2017, Mongolia passed new law on "Organic Food" which attracting farmers, especially those who are involved in vegetable farming, to stop using pesticides and turning more to biological and organic methods like replacing compound fertilizers with composts.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2018, develop the best options on using government subsidies in agricultural sector

Use of agricultural chemicals were minimal largely due to access to adequate financial services. At the same time government also promoting "Organic Food" which is creating favourable incentive to minimize agro-chemical application.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).
Law on toxic and hazardous substances (2006)
https://www.legalinfo.mn/law/details/517

https://www.legalinfo.mn/law/details/526

https://www.legalinfo.mn/annex/details/5292?lawid=8065

https://www.legalinfo.mn/law/details/11884

https://www.legalinfo.mn/law/details/14135

Goal 7. Increase forest cover to 9% by 2025 through the improvement of forest management, and thereby protect forest biodiversity.

Objective 16. Ensure inter-sectoral cooperation on the national policy on forest and its implementation plans

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

As of 2018, the Mongolian forest stock volume is estimated at 1252.5 million cubic meter. 78.7 percent Larch (*Larix sibirica* Ldb.), 9.3 percent Cedar (*Pinus sibirica* Du Tour.), 6.1 percent Birch (*Betulla sp.*), 5.0 percent Scots Pine (*Pinus sylvestris* L.), 0.23 percent Spruce (*Picea obovata* Ldb.), 0.02 percent Siberian fir (*Abies sibirica* Ldb.), 0.2 percent Cottonwood (Populus sp.), 0.05 Poplar (Populus sp.), 0.01 percent Elm (*Ulmus pumila* L.), 0.28 percent Willow (Salix sp.), 0.002 percent Euphrates poplar (*Populus diversifolia* Schrenk.), 0.15 percent Saxaul (*Haloxylon ammodendron* C.A. Mey.).

Table 7. Forest total stock volume by forest type (in million cubic meter)

Forest type	2010	2011	2012	2013	2014	2015	2016	2017	2018
Larch	1058,5	1034,1	1035,1	1304,7	977,1	977,3	978,1	985,9	985,9
Scotch Pine	66,7	63,7	63,7	63,8	61,8	61,8	62,1	62,1	62,1
Cedar	126,8	120,8	120,8	120,8	116,1	116,1	116,9	116,9	116,9
Spruce	3,6	3,6	3,6	3,6	2,9	2,8	2,8	2,8	2,8
Siberian fir	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2

Birch	86,5	83,9	83,9	81,9	76,8	76,8	76,8	76,2	76,2
Cottonwood	2,4	2,3	2,6	2,5	2,2	2,2	2,2	2,2	2,2
Poplar	1,3	1,3	1,3	1,1	0,7	0,67	0,67	0,67	0,67
Elm	0,05	0,08	0,09	0,09	0,08	0,08	0,08	0,08	0,08
Willow	1,8	1,9	3,1	3,5	3,4	3,4	3,4	3,5	3,5
Saxaul	1,5	1,5	1,8	1,8	1,8	1,8	1,8	1,8	1,8
Euphrates poplar	-	-	0,01	0,01	0,03	0,03	0,03	0,03	0,03
Total	1349,5	1313,4	1316,3	1313,7	1243,1	1243,4	1245,4	1252,5	1252,5

Source: Forest Research and Development Center, 2019

The coniferous forest have average age of 133.4 years old and has 151.3 m3 reserve while broad leaf forests have average age of 46.1 year with reserve of 46.2 m3

In order to promote the sustainable forest management in the country, Mongolia the Government had drafted State Policy on Forests which was approved by the Parliament by the Resolution No. 49 of May 14, 2015. The mid-term action plan for the implementation of Sate Policy on Forest was approved in 2017 and immediately put into implementation that resulted 50.6 percent of planned activities were accomplished at the end of the same year.

In parallel, amendments were made to the Law on Environmental Protection, the Forest Law and the Law on Government Special Funds to improve legal environment for SFM and combat illegal logging.

Those policy level changes allowed the Government to establish 38 inter-county forestry units and created a professional forest management system in the rural areas. In addition, the tariff reforestation and forestry measures were increased 2-3.5 times, along with changes that allow government to purchase cultivated forests from private sector or transfer the ownership.

As of 2018, 3,345.4 thousand hectares of forest area being managed by 1281 Forest User Groups in addition to 90 private sector that manage 681.4 thousand hectares of forested area, and thus, diversifying forestry management solely run by the government.

Those action have already bringing positive results and as of 2018 the forested area was in increased by 133.6 thousand ha and forest stock was increased 7.1 men m3 compared to 2016. Over the past years proportion of forest covered area has steadily increased at rate of 0.1% annum.

However, the forests of Mongolia continue to suffer from forest fire and forest pests. Of 14 thousand insect species of the country 737 species from 62 families feed on forest and shrubs damaging the forest various scale. The regular monitoring of the hotspots and preventive actions has helped decrease the outbreak areas by 45.5 percent compared to 2016 despite the limited budget allocated to the prevention and pest control work.

The forest and steppe wildfire in Mongolia continue to be one of the major damaging factor that also induce forest pest infestation. Although forest fire in 2018 was almost 10 fold less than 2017, the trend analysis over the past 37 years show that spring forest fire start time is moving from mid-March

to mid-February and autumn wildfire season moved from October to end of November beginning of December.

Table 8. Forest and steppe wildfire in Mongolia

	2011	2012	2013	2014	2015	2016	2017	2018
Number of wildfires								
Province	17	19	19	18	16	14	13	13
County	76	103	89	101	114	61	76	48
Total	161	229	198	281	354	138	220	77
Total affected area (in thousand ha)								
Forest	20.2	340.9	5,8	18,3	31	17.1	120.9	16,6
Steppe	2000.0	4700.0	5601,9	3080,8	5816.9	4700.0	466.6	552,0
Total	2020.0	5050.0	5607,7	3099,1	5847,9	2900.0	587,5	568,6
Damage (in million MNT)								
Total	2776.1	83723.8	6557,2	11149,8	6270,0	8649.9	77.790.2	39530,6
Ecological	2479.4	82000,0	4921,5	10123,9	5940,0	8100,0	77.272.8	39277,9

Source: National Emergency Management Agency, 2019

Such changes in wildfire season posing risks of year around wild fire in the future.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2016, an integrated national policy on forest and program of action is developed and approved.
➢ By 2019, the implementation of action program on forest protection and sustainable use is enabled with participation of relevant stakeholders.

State Policy on Forests which was approved by the Parliament in 2015 and the mid-term action plan for its implementation was approved in 2017. 50.6 percent of planned activities of the mid-term plan were accomplished at the end of 2017.

As of 2018, 3345.4 thousand hectares of forest area being managed by 1281 Forest User Groups in addition to 90 private sector that manage 681.4 thousand hectares of forested area, and thus, diversifying forestry management solely run by the government.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/423

Mongolian Multipurpose National Forest Inventory 2014-2017. (2019). Mongolian Ministry of Environment and Tourism. 2nd ed. Ulaanbaatar.

Report of State of the Mongolian Environment, 2017-2018. (2019). Ministry of Environment and Tourism. Ulaanbaatar.

State Policy on Forests. (2015). Parliament of Mongolia. Ulaanbaatar

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STRATEGY 3. SUSTAINABLE USE OF BIODIVERSITY

Goal 8. Introduce management techniques for the sustainable use and conservation of natural resources, especially game animal resources, by mean of utilizing the creation of partnerships between government, local citizens, and private sector.

Objective 17. Create a legal environment enabling local community partnerships to be responsible for surrounding natural resources in an integrated way including pasture, wildlife and forests.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Since 2012 Mongolia begun shift its environmental policy to "the user is the steward" concept and a number of law were amended to bring the local communities and private sector into the arena.

The Law on Forests was amended spelling out rights and responsibilities of forest user groups and Law on Fauna was revised and introduced first time in Mongolia the community based wildlife management (CBWLM) and designation and management of hunting areas. The revision work on the Law on Flora has been finalized by the working group and currently being prepared for the Government consideration.

In addition, the batch law Environment was reviewed and laws, regulations and guidelines were developed and put in place to improve the legal environment for local communities' right and responsibilities for use and conservation of the natural resources. In collaboration with state organizations, international projects and non-governmental organizations a training manuals, training materials on "Integrated natural resources management by local communities" and a number of training were conducted.

Box 7. Local community involvement in hunting areas and their management:

Prior to 2012, in Mongolia hunting was permitted except for urban areas and special needs areas like Protected Areas, or over 70% of Mongolian territory was de facto hunting ground. According to the Law on Fauna, which was revised in 2012, hunting is now limited to hunting zones, which is managed either by private sector or local communities that have management responsibility over the area.

The lessons and best practices that were generated by WWF, UNDP projects in Community Based Wildlife Management that begun in 2008 in "Gulzat" area in Western Mongolia had played pivotal role for bringing together local communities and trophy games that were considered almost as a nuisance by locals.

As of 2018, 25 CBOs, 7 local NGOs along with 11 private companies are managing 171 hunting areas located in Mongolia.

In order to attract private sector and local communities in conservation and sustainable use of wild plants, the Government Action Plan for the 2016-2020 included an objective to "Support reintroduction and commercial planting of threatened and economically important plants through capital, finance and tax policy" was developed. During the past period, a number of initiatives were taken to create attractive environment for private sector to plant economically important wild plants at commercial scale.

In 2019, 489 species of plant were assessed using the Red List criteria. The second edition of the Conservation Action Plan for Mongolian plants Red List Flora is printed out for public use.

At the same time, the list of rare plants with high demand is prepared and recommendation on cultivation of these plants were developed and disseminated. In parallel, standards for harvesting, drying, packaging, transportation and storage of 10 most commonly collected wild plants such as Greater celandine (*Chelidonium majus* L.), Redhaw hawthorn (*Crataegus sanguinea* Pall.), valerian (*Valeriana officinalis* L.), Great burnet (*Sanguisorba officinalis* L.), thermopsis (*Thermopsis lanceolata* R. Br.), *Rheum undulatum* L., *Saposhnikovia divaricata* (Turcz.) Schischk.), *Ephedra sinica* Stapf., *Gentiana decumbens* L., and Artemisia.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2017, a legal environment enabling local community partnerships to be responsible for surrounding natural resources in an integrated way including pasture, wildlife and forest is created.
➢ By 2020, local community partnerships and other parties' about the concept of integrated management of natural resources is fully understood.

The Law on Forests and Law on Fauna are already revised and by-laws are in place to allow local communities to have management responsibility for conservation and sustainable use of their surrounding natural resources.

The revision work on the Law on Flora has been finalized by the working group and currently being prepared for the Government consideration.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/8670

https://www.legalinfo.mn/law/details/8935

https://www.legalinfo.mn/annex/details/5448?lawid=8644

https://www.legalinfo.mn/law/details/8663

https://www.legalinfo.mn/annex/details/6215?lawid=9794

Report of State of the Mongolian Environment, 2015-2016. (2017). Ministry of Environment and Tourism. Ulaanbaatar.

Report of State of the Mongolian Environment, 2017-2018. (2019). Ministry of Environment and Tourism. Ulaanbaatar.

Goal 8. Introduce management techniques for the sustainable use and conservation of natural resources, especially game animal resources, by mean of utilizing the creation of partnerships between government, local citizens, and private sector.

Objective 18. Implement the hunting management in all game reserve areas.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Since 2012, Mongolia has started new policy paradigm "the users are the stewards" in country's game management, which became instrumental for mobilizing private sector investments to the conservation and sustainable management of wildlife in hunting areas.

As of 2018, there are 171 hunting areas in 18 provinces of the country (Figure 15) where hunting is allowed under proper management in contrary to prior 2012 where almost 70% of the country was open for hunting.
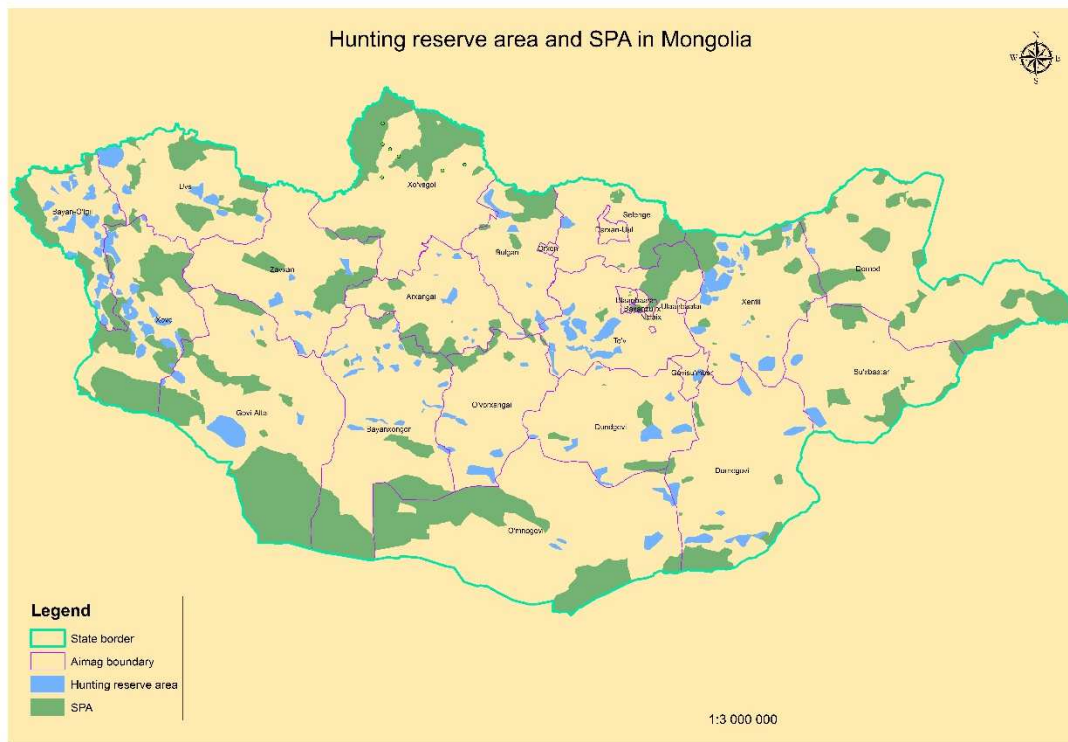
Source: Ministry of Environment and Tourism, 2019

Figure 15. Location of Hunting areas and protected areas network in Mongolia

Of those 171 hunting areas, 66 are for Argali sheep, 42 are for Siberian ibexes, 33 are for Red deer, 13 are for Roe deer, 8 for Wild boar, 5 areas for Taimen fish and 4 areas are designated to gamebirds.

Within these areas, the Government of Mongolia has delegated conservation and management of 42.9% (approx. 7800 heads) of the Argali sheep population, 17.9 % (approx. 6500 heads) of Siberian Ibex population and 10% (approx. 1600 heads) of Red deer population of the country to the private sector and local communities.

As of 2018, these 171 hunting areas are managed by 25 CBOs, 7 local NGOs and 11 companies through a long term contractual agreement with the Local Government that entered into agreement based on thorough due diligence assessment. These 43 organizations are annually conducting wildlife assessment using umbrella species in their areas rendering certified organizations' services as per their agreement and reporting back to the Local Government.

Table 9. Revenue and disbursement of funds generated from the game species

Type	Performance (in million MNT)	
	2017	2018
Revenue	5,093,8	5,847,7
Disbursement	610,576	725,198

Source: Ministry of Environment and Tourism, 2019

During 2017-2018, Mongolia has generated MNT10.94 billion from game species, however, only MNT1.3 million of it were disbursed back for the conservation of the given species. This is far less

than expected minimum 50% of revenue to be reused for the conservation of the given species as it was stipulated in the Law on Payment for Natural Resources Use and its by-law.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☒ Measure taken has been effective
☐ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2016, responsibility for hunting area management to local community partnerships and private enterprises is fully handed over.

➢ By 2020, a legal environment for imposing customs tax of game species and natural plant exports is created.

As of 2018, all 171 hunting areas in Mongolia are managed by 25 CBOs, 7 local NGOs and 11 companies through a long term contractual agreement with the Local Government that entered into agreement based on thorough due diligence assessment.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/8670

https://www.legalinfo.mn/law/details/8935

https://www.legalinfo.mn/annex/details/5448?lawid=8644

https://www.legalinfo.mn/law/details/8663

https://www.legalinfo.mn/annex/details/6215?lawid=9794

Report of State of the Mongolian Environment, 2015-2016. (2017). Ministry of Environment and Tourism. Ulaanbaatar.

Report of State of the Mongolian Environment, 2017-2018. (2019). Ministry of Environment and Tourism. Ulaanbaatar.

Goal 9. Taking into account grazing capacity and livestock population size, utilize legislative and economic leverages to reduce pasture degradation by up to 70% and increase quality of existing pastures.
Objective 19. Reflect in Pasture law and in other relevant legislations the suitable economic instrument which regulates livestock breeding in accordance with its natural carrying capacity.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Both the First National Biodiversity action plan prepared in 1996 and the second National Biodiversity Strategic Action Plan of Mongolia regarded sustainable pastureland management that cover 72.1% of the whole Mongolia as one of the high priorities in mitigation of ecosystem deterioration and increased capability of carbon capture sequestration in pastureland. Many other National action plans such as national program "Mongolian Livestock" as well as the "Mongolia's sustainable development vision -2030" consider reversing land degradation as a ways for sustainable livelihoods in rural Mongolia. Moreover, the Government Plan of Action for 2016-2020 included development and approval of law on "Pastureland protection" along with other laws such as Law on Livestock gene pools, Livestock and animal health, Law on supporting and animal husbandry, to improve the use and protection of pastureland and thus ensure sustainable animal husbandry in Mongolia.

However, the draft law on Pastureland has been returned back once again. Indeed international community and concerned stakeholders within the country have been advocating the law on pastureland over the past two decades, i.e., ever since the first major "*dzud*" winter natural disaster that killed over 7 million livestock affecting much of rural community.

To date, Mongolia has no policy that aims to limit the growth of livestock number, which is impacting land degradation. Instead, the populist decisions made during the election period to get more support from herders leading to increase the number of livestock economic instruments (compensation for wool producers, subsidies for cashmere makers etc.) is further exacerbating the situation.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☐ Measure taken has been partially effective
☒ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

> ➢ By 2018, fauna species to the pasture ecosystem in pasture capacity assessment methodology is included.
> ➢ By 2020, the legislation on pasture regulation is established.

Despite the fact that the Government Plan of Action for 2016-2020 included development and approval of law on "Pastureland protection" along with other laws the draft law on Pastureland has been returned back. Indeed international community and concerned stakeholders within the country have been advocating the law on pastureland over the past two decades, in a vain.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Goal 9. Taking into account grazing capacity and livestock population size, utilize legislative and economic leverages to reduce pasture degradation by up to 70% and increase quality of existing pastures.

Objective 20. Create a stable financial framework for the restoration of degraded soil, protection of soil vulnerable to climate change and prevention of soil degradation.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

In Mongolia, 73.4 percent of the territory is classified as an agricultural land, of which, 96.1% is considered as pastureland, 1.49% is haymaking area and 0.95% is farmland. Over the past four years' period, there were slight decrease in pastureland and haymaking area due to change in land classification to other categories like mining, road network. The increase in arable land however, took place thanks to reclaiming some of the abandoned in 1990s farmland.

Table 10. Agricultural land classification (in thousand ha)

Agricultural land types	2015	2016	2017	2018	$\frac{2018}{2015}$
Total Agricultural land	114,982.80	114,934.90	114,843.60	114,809.20	-176.3
Pastureland	110,613.60	110,493.80	110,391.60	110,391.60	-222,0
Haymaking area					- 8,6
Farmland					+72,6
Abandoned					-73,4
Agricultural infrastructure	74.40	110.60	116.40	116.40	+42,0
unsuitable area	1259.7	1259.7	1259.7	1259.7	0

Source: 1212.mn (Unified Land Territory), 2019

In accordance with 2016 land degradation assessment, 92% (6.2 men. ha area) accounted from pastureland. In 2018, the degraded pasture area was increased by another 798.4 thousand ha, making the share of degraded pasture 95.1% of all degraded areas in the country.

The pastureland degradation caused by seven major factors, of which overgrazed and pest (rodents and insect) affected areas constitute the majority of the share.

Table 11. Pastureland degradation in Mongolia (in thousand ha)

Pasture land degradation factors	2014	2016	2018	2018 2014
Overgrazed	1,890.8	2,005.0	1,483.4	-407,4
Water and wind eroded	27.8	25.0	10.85	-16,95
Waterlogged	15.7	15.7	0.35	-15,35
Sand shifted Элсний нүүдэлд орсон	150.3	201.7	146.6	-3,7
Rodent, insect affected	1614.9	2,400.0	4,956.7	+3341,8
Desertification affected	3,750.0	1,500.0	353.1	-3396,9
Mining affected (road)	2.9	53.8	49.0	+46,1
Total	7,452.4	6,201.2	6,999.6	-452,4

Source: Ministry of Food, Agriculture and Light Industry, 2019

If considering the fact that Brandt's vole (*Lasiopodomys brandtii* Raddle) and grasshoppers often are indicators of already overgrazed land, overgrazing could be counted as 92% of all degradation, while areas affected by the desertification process, which account 7.1% of degradation account second most affecting factor to the health of pastureland in Mongolia.

In response to the pasture degradation, state and local government annually allocate modest budget and all amelioration works are compiled at the Ministry of Food, Agriculture and Light Industry. Below are summary of interventions that took place in 2017.

Table 12. Pasture amelioration work carried out in 2017

Interventions carried out	Area (in ha)
Protected from sand shift	46.3
Ameliorated	6,618.5
Rodent control conducted	607,846.2
Cleaned from waste	6,641.0
Carrying Capacity regulated	331,795.5
Rested	51,012.6
Put into rotational grazing	895,092.1
Total	1,899,052.2

Source: Ministry of Food, Agriculture and Light Industry, 2019

In Mongolia, the soil fertility is only assessed in farmland and the assessment in 2016 show that the loam lighter soil which is dominant farmland soil in Mongolia lost 25.4 t/ha of humus rich top soils from less eroded fields, 133.4t/ha top soil from moderately eroded fields and 213 t/ha top soil from severely eroded fields. The loss of humus content in these field amount average of 4.8-8.6 t / ha from less eroded fields, 10 to 21.3 t/ha from moderately eroded fields and 21,6 to 40,8 t/ha humus from severely eroded fields. Currently, 47.7% of all fields have 0.9-1.9% humus content, which is the poorest of international classification. Over past 40 years, the field with 3% and above humus content decreased by 9.5% and fields with humus content 2.0-2.9% and 1.0-1.9% have decreased by 11.0% and 23.2% respectively. At the same time fields with humus content less than 1% increased by percent.

Although the Law Land stipulate that farmlands are subject to mandatory soil agrochemical analysis every 5 year, farmers do comply with it in the absence of local government monitoring. Over the past years, there were interventions to ameliorate crop field that lost its fertility and rehabilitate abandoned farmland.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☐ Measure taken has been partially effective
☒ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2017, economic incentives for the restoration of degraded soil, protection of soil vulnerable to climate change, and prevention of soil degradation is included in the policies and legislation of related sectors such as agriculture and mining infrastructure.
➢ By 2020, restoration of degraded soil, protection of soil vulnerable to climate change, and prevention of soil degradation in areas important to biodiversity is implemented.

Despite the fact that the Government Plan of Action for 2016-2020 included development and approval of law on "Pastureland protection" along with other laws the draft law on Pastureland has been returned back.

Although the Law on Land stipulate that farmlands are subject to mandatory soil agrochemical analysis every 5 year, farmers do comply with it in the absence of local government monitoring.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

http://mofa.gov.mn/

Nyamsambuu, N. Ikhbayar, D. (2016). Cropland use and soil erosion of Mongolia. Journal of Soil Science of Mongolia. pp. 94-102

Report of State of the Mongolian Environment, 2015-2016. (2017). Ministry of Environment and Tourism. Ulaanbaatar.

Report of State of the Mongolian Environment, 2017-2018. (2019). Ministry of Environment and Tourism. Ulaanbaatar.

Goal 10. Modernize industrial farming techniques and activities to meet requirements for food safety and conservation of biodiversity in the environment's agricultural ecosystem.
Objective 21. Integrate agriculture sector land use with environmental protection policies.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Traditionally Mongolia has never been farming country. Until 1950s, individual households did grow small amount of wheat, millet and barley of own consumption, but situation changed with large scale farming under central planning system. However, at that time the sensitivity of Mongolia's dryland soil to mechanical disturbance and by 1970s country already lost 260 thousand hectares of land to a wind erosion. Thanks to series of Government resolutions on soil erosion prevention by during 1974-1981, the wild erosion was curbed and minimized by 75% by 1985. The revised Law on Crop Farming (2016) stipulated application of soil degradation prevention measures and introduction of environmentally safe technologies, however, the actual implementation of the revised law is having same fate of initial law from 2004.

Currently most of abandoned crop fields located in Western and Central Provinces of Mongolia and despite the absence of any disturbance over 30 years and natural vegetation around the area, no natural succession is taking place in these abandoned field. During 2010s Ministry of Environment and Tourism did allocate some funds to recover some of these abandoned fields by planting perennials. However, due to lack of fund this work was stopped.

The Law on Organic Food (2016) and its supporting by-laws are considered positive nudging factor for the private sector to introduce agrochemicals free and environmentally friendly farming into the practice. However, in the absence of market demand at current state no significant change is expected.

On the contrary, the Government subsidies to agricultural sector in support of "3rd Campaign on Virgin Land" program, which enabled the farmers to buy discounted seeds, fertilizers, plant protection chemicals is inducing farmers to increase use of agro-chemicals including herbicide Round-Up.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☐ Measure taken has been partially effective
☒ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2018, the detailed environmental impact assessments is implemented during the investigation of land for use under the irrigated agriculture and hay making; legislation is created to release of land important to biodiversity.
➢ By 2020, based on results of detailed environmental impact assessments land important for biological diversity is released from mining and agriculture land use and taken under the protection.

The Government subsidies to agricultural sector in support of "3rd Campaign on Virgin Land" program, which enabled the farmers to buy discounted seeds, fertilizers, plant protection chemicals is inducing farmers to increase use of agro-chemicals including herbicide Round-Up.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/11641?lawid=11641

https://www.legalinfo.mn/law/details/471?lawid=471

https://www.legalinfo.mn/law/details/11644?lawid=11644

https://www.legalinfo.mn/law/details/12972?lawid=12972

https://www.legalinfo.mn/law/details/11725?lawid=11725

https://www.legalinfo.mn/law/details/11485

https://www.legalinfo.mn/annex/details/7409?lawid=12120

STRATEGY 4. IMPROVE POLICIES AND LEGAL ENVIRONMENT FOR CONSERVATION AND USE OF BIOLOGICAL DIVERSITY AND ECOLOGICAL SERVICES.

Goal 11. The biodiversity related indicators are reflected in the national evaluation system to monitor the implementation of project and programmes of relevant sectors.
Objective 22. Define biodiversity related indicators based on comprehensive research and integrate it into national accounting system.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

During 2014 - 2016, the Mongolian Parliament approved three important policy and regulatory documents that enable the country move towards sustainable development in an integrated way. These documents include the "Green Development Policy" (2014), the Law on Development Policy Planning (2015) and the "Sustainable Development Vision of Mongolia - 2030" (2016).

The Green Development Policy defined six strategic goals and the ways to implement them in each sector and started its first phase of 2014-2020. The six indicators of the Policy document were developed in collaboration with the National Statistical Office (NSO) and incorporated key biodiversity parameters.

These long-term development policy documents stipulate that sustainable environmental development is the basis for efficient use of natural resources, preserving the ecosystem balance and achieving

long-term benefits, as well as inclusive economic growth, social sustainability, and the quality of human life.

The 20 basic indicators of Sustainable Development Vision of Mongolia-2030 that aims to measure, inter alia, above mentioned principles, included three indicators that are directly linked to biodiversity (table 13). The baseline and target benchmarks of these indicators were defined and monitored and reported to the public via website by the NSO.

The NSO had also assessed all 244 indicators identified by the 48th Session of the United Nations Commission on Statistics for evaluation of the achievement of global SDG to identify applicability of them to the country. This assessment included global indicators for SDG 6, 7, 11, 12, 13, 14 and 15 that are related to environment and biodiversity.

Table 13. Status of some of the environmental aspects

	Indicators, unit	2014	2015	2016	2017	2020	Source of verification
1	Environmental performance index, rank	111	...	114	…	105*	Yale University
2	Area affected desertification, %	78.2	76.8	…	…	74.6*	MET
3	Area of specially protected land, %	13.5	13.5	13.5	13.5	25**	MET

Source: sdg.gov.mn

In addition, the National Development Agency developed the target benchmarks of 52 indicators of the Sustainable Development Vision -2030 for year the 2020 and 2025, of which below nine are related to biodiversity and environment.

- Percentage of introducing zero tillage technology in cereals production - 70%;

- Percentage of renewable energy in total energy - 85%;

- Percentage of runoff forming area included in special protection - 50%;

- Percentage of population with safe drinking water - 80%;

- Percentage of households with improved sanitation - 40%;

- Percentage of greenhouse gas emission reductions - 2%;

- Percentage of forest covered area in total - 8.5%;

- Percentage of urban green areas - 15%;

- Percentage of recyclable waste for total waste - 20%.

Within the framework of the Environmental and Economic Account System the "Material Flow Account" was set first piloted in 2014 started its application from 2015. In the framework of the project "Strengthening the Capacity Building for Environmental and Economic Accounts", ADB has supported the NSO in developing the "Energy Balance Flow Accounts" and "Environmental Tax Accounts" in 2015. Some methodologies for environmental economic accounts have now approved by the Chairman of the NSO. These include:

- Basic indicators of green development and methodology for calculation;

- Methods for establishing energy balance flow account;

- Methods for the creation of a material flow account

- Method of establishing an environmental tax account.

The NSO started organizing training on "Water Accounts", "Waste Accounts" and "Air Pollutant Emissions Accounts" in 2019, and thus, it is possible to estimate the indicators of biodiversity within these accounts.

The "Government Action Plan for the 2012-2016 Action Program" includes a list of research proposals for the Ministry of Environment and Green Development, which includes "Updates on economic statistics of natural resources and systematic methodology for joint assessing impacts of mineral sector on the economic and financial sectors". However, some of the Government planned actions such as "Update of the biodiversity indicator baseline data collection templates and methodology", "Development of recommendations for phased establishment of Environmental and Economic Account System" are being slow to start.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

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Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2017, the biodiversity indicators are included into the green development indicators.
➢ By 2020, feasibility study is conducted to account the contribution from environmental sector to the social and economic development into the national accounting system and recommendations are issued accordingly.

The Green Development Policy defines six strategic goals and the ways to implement them in each sector and started the first phase of 2014-2020 with six indicators that include key biodiversity parameters.

The National Statistical Office has defined the baseline and target of the 20 basic indicators of Sustainable Development Vision of Mongolia-2030, of which three are directly linked to biodiversity. In addition, the National Development Agency developed the desired benchmarks of 52 indicators of the Sustainable Development Vision -2030 for year the 2020 and 2025, of which nine are related to biodiversity.

However, since there are no comprehensive biodiversity assessment data, these indicators are not well defined and the process of entering into the national accounting system is slow.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/1148

https://www.legalinfo.mn/annex/details/7310

https://www.legalinfo.mn/annex/details/6438

https://www.legalinfo.mn/law/details/11886

http://sdg.gov.mn/

Биологийн олон янз байдлын үндэсний хөтөлбөрийг хэрэгжүүлэх үйл ажиллагааны төлөвлөгөө. (2018). БОАЖЯ

Монгол Улсын байгаль орчин-эдийн засгийн зарим данснууд, ҮХГ, 2018

Монгол Улсын Засгийн газрын 2012-2016 оны үйл ажиллагааны хөтөлбөрийг хэрэгжүүлэх арга хэмжээний төлөвлөгөө. (2018). ЗГХЭГ

Монгол Улсын дунд хугацааны (2018-2025) хөгжлийн хүрээ: судалгааны тайлан. (2018). ҮХГ, НҮБХХ. p. 68

ҮСХ-ны даргын 2017 оны 07 сарын 03-ны A/103 тоот тушаал

ҮСХ-ны даргын 2018 оны 6 дугаар сарын 7-ны өдрийн A/64 тоот тушаал

Goal 11. The biodiversity related indicators are reflected in the national evaluation system to monitor the implementation of project and programmes of relevant sectors.

Objective 23. Integrate protection and sustainable use of biodiversity into policies and programs of related sectors.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

According to the National Development Agency's data, around 570 development policies and documents have been approved since 1990, currently 203 are valid, 68 are invalid, 294 have expired and 3 have been terminated.

Table 14. Development Policy Documents in effect

Approved by the Parliament - 51			Approved by the Government Directive – 145		
№	*Type of documents*	*Number*	№	*Type of documents*	*Number*
1	Vision	5	1	Policy	12
2	Policy	23	2	Strategy	9
3	Policy foundation	1	3	National Program	70
4	Strategy	2	4	Program	30
5	General Direction	6	5	Sub-Program	3
6	National Program	8	6	Master Plan	1
7	Program	1	7	Plan	17
8	Plan	3	8	Direction	6
9	Direction	1	9	List	3
10	List	1			

Source: Research Development Policy and Planning Papers, National Development Agency, 2019.

The following are some of the common deficiencies in these development policy documents that have been implemented over the period before the adoption of the Development Policy Planning Law. These include:

- Develops and approves many policy documents that are unified and linked to various concepts, policies, policies, policies, guidelines, national programs, programs, sub-programs, plans, master plans, directions and lists.
- As these documents were not implemented in financial terms, the government did not pursue the replacement of the results of the Parliamentary Election after the election of the State Great Khural.
- Majority of government policies and programs on particular sector development focus primarily on issues of the sector, but lack of conservation and proper use of the EIA.
- The process of developing, approving, implementing, monitoring, and evaluating development policy papers was largely messy

The National Audit Office report of 2018 titled "Compliance Report on the Implementation of the Policy on Development Policy Planning" concluded that the enforcement of the Law on Development Policy is weak and work on coordination of development and sectoral policies and the suspension and termination of some unnecessary policies are progressing slowly.

The following two sectors can illustrate the lack of enforcement of biodiversity conservation and rational use in sector development policies and programs.

In order to protect the environment in the agricultural sector, the "Mongolian Livestock" National Program (2010-2021) foresaw:

3.4.1.3 - Incorporate the number and type of livestock into pasture carrying capacity, establish the maximum number of animals to be kept in areas where pastureland is overloaded and create economic incentives;"

3.4.1.4 - The legal environment for pastureland use fees and the use of certain parts of the pastureland for protection and improvement of pastureland use fees shall be based on the herder's type and regional characteristics of herders and livestock."

However, none of these objectives been implemented yet.

The "State Policy on the Mineral Sector" approved by the State Great Khural in 2014 included "Objective 2.1.2 - Promoting modern technologies, innovation and promotion of low-impact human health and environment in the extraction and processing industry" to ensure sustainable development principles.

Yet, the implementation of this objective has not been sufficient and overshadowed by the quick economic returns.

The Ministry of Environment and Tourism MET has implemented projects and programs with international organizations such as the United Nations Green Partnership (PAGE), the Global Green Development Organization (GGGI), and the Clean Development Mechanism to achieve goals and objectives set in the Green Development Policy, thus integrate biodiversity into policies and programs of other sectors.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2016, national biodiversity program implementation with the activities of the Mid-term programs for green development and other programs is integrated.
➢ By 2018, human resources capacity is strengthened to implement and reflect biodiversity indicators in the national accounting system.

The National Audit Office concluded that the enforcement of the Law on Development Policy is weak and work on coordination of development and sectoral policies and the suspension and termination of some unnecessary policies are progressing slowly.

Although sectoral policies of productive sector such as agriculture and mining do include environmentally green actions, the actual implementation of these actions and plans are often lacking in the absence of earmarked fund and proper M&E.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/annex/details/3340?lawid=7039

https://www.legalinfo.mn/law/details/9756

Бодлогын баримт бичгүүдийн нэгтгэл. (2019). Үндэсний хөгжлийн газар. Улаанбаатар

Хөгжлийн бодлого төлөвлөлтийн баримт бичгийн судалгаа. (2019). Үндэсний хөгжлийн газар. Улаанбаатар

Хөгжлийн бодлого төлөвлөлтийн тухай хуулийн хэрэгжилтэд хийсэн нийцлийн тайлан. (2018). Үндэсний Аудитын Газар. Улаанбаатар

Goal 12. Create a legal environment where subsidies or financial assistance are prohibited for use in agriculture, mineral resource extraction, infrastructure, energy, light industry, food manufacturing, and service industry projects and actions deemed to be harmful to or potentially harmful to biological diversity in accordance with SEA.

Objective 24. Define and implement actions to reduce economic instruments that threaten biodiversity.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Reducing and mitigating potential negative subsidies to biodiversity is a cost-effective investment in protecting it. However, there are little research on the type of subsidies and mitigation that may adversely affect biodiversity in different sectors of the economy. A 2014 study on the estimation of "Estimation and Analysis of Agricultural Subsidies in Mongolia" was published by the World Bank. This study covered the period of 2008-2012 and assessed the state subsidy policy, its form and its incentives for livestock, crop and small-scale processing.

The report the assessed advantages and disadvantages of various forms of subsidies to the sector such as incentives and subsidies for grain production (seeds and fertilizers), support for cashmere, wool, veterinary services, hay and pasture irrigation as well as state support and subsidies in the form of loans including loans the processing industry. Most of these support and subsidies are still ongoing.

It is considered as a subsidy for livestock breeding by one of the key factors that the livestock increase. However, the World Bank study, for example the incentives for sheep wool, is not the main factor in raising sheep numbers, and recommended "the issue of subsidization in the livestock sector should take into consideration the environmental issues, such as pasture carrying capacity and long-term sustainable use of pastures."

In 2017, B.Chimed-Ochir prepared an analytical report titled "Assessment of Funding for National Biodiversity Action Plan and Its Implementation Plan" as part of his work for the UNDP supported BIOFIN project and identified six main subsidies that have direct impact to biodiversity in Mongolia (table 15).

Table 15. Subsidies in Mongolia that might have negative impacts on biodiversity

Subsidies type	Note	Possible impact to BD	Current status
One. Livestock sector:			
Personal income tax	The "animal footprint tax" tax, which was taken from the herders according to the personal income tax law was canceled in May 2009	Became one of the factors for increasing livestock number and overgrazing.	Effective
Exemption of herders from pasture and hayfield land use fee	Law on Land use fee exempted herders from the fee but not the individual and third-party's livestock from the fee.	Became one of the factors for increasing livestock number and overgrazing.	Effective
Incentive for livestock raw materials	Incentive for hides, skins and wool to support national industry	Can become factor for increasing livestock	Effective
Support cashmere production	Cash incentive for cashmere to support national industry	One of the factors for disrupting livestock	Single case

		effective composition and ratio	
Grants to pasture management	State budget allocated to carrying out rodent control in pastureland and deep well drilling for livestock watering	Creating competition between livestock and wildlife for habitats; pesticide application impacts the predators preying on rodents and ineffective in long	Continued
Two. Crop sector:			
Subsidies to fertilizer	Soft loan	Water pollution	Irregular

Although the there is no direct negative impacts to environment, the state subsidizes and supports cashmere processing and wheat and flour with a significant cash incentive. According to the Minister of Food, Agriculture and Light Industry by the year 2016, 292.4 thousand tons of grain was harvested and sold to flour mills and 14.9 billion MNT was distributed to 726 farms/farmers as an incentive for it. In 2017, state allocated MNT 14.8 billion to support the wheat production, of which MNT 7.8 billion were distributed as an incentive for 118.0 thousand tonnes of grain sold to flour mills and MNT 7 billion was spent as subsidies for 31.8 thousand tons wheat seed for 2018 cropping season.

Box 8. Some of the subsidies having negative impact on biodiversity of Mongolia

Gold royalty fee. Since 2014 the Government has repeatedly amended the Minerals Law and reduced the royalty rate to 2.5%, which has had a negative impact on biodiversity. Under this regulation, the amount of gold exported to the Bank of Mongolia and its authorized commercial banks has been increasing year by year and gold revenues have increased, reaching 20 tons in 2017, but the environmental impacts are huge.

Personal income tax exemption. According to the Article 16.1.13 of the Personal Income Tax Law, herdsman households and livestock have been exempt from tax for livestock since 2009. During this period livestock numbers doubled and the grazing pressure has increased dramatically. Of course, this is a form of discount that has had negative impacts on pasture degradation and biodiversity.

Benefitting from weak legislation. "Law on prohibiting mineral exploration and exploitation in headwaters, protection zones of water bodies and forested areas" was approved in in 2009. The Government's Decree on that support aforementioned law "Revoking licenses issued in headwaters and intervention measures and rehabilitation of already mined areas in protection zones of water bodies" was amended 7 times since 2014, softening the requirements in each amendment, discounting the legislation or the effectiveness of the service.

Adverse incentives. Parliament Resolution #74 of 2013 "Remuneration of herders and national producers" and Government Resolution # 122 "Cash incentive for herder and cooperative members for sale of camel and sheep wools to national industry" are both effective to date. Under these resolution, substantial public funds were disbursed to herders, which may have a negative impact on pastureland carrying capacity.

Since 2012, the "Law on Environmental Impact Assessment" has begun to incorporate Strategic Environmental Assessment (SEA). The following procedures and procedures have been approved by the Minister of Environment and Green Development to support the implementation of the Law. These include:

- "Procedures on Public Participation in Environmental Impact Assessments", A / 03, 2014;

- "Methodology for conducting SEA and Cumulative Impact Assessment", Order A / 117 of the Ministerial Decree.

In accordance with the Law, the line Ministries who originates the policy, program and plan is tasked to carry out the SEA in these policy document and submit the documents to the Ministry of Environment and Tourism before submitting to the Cabinet. Currently, no SEA has been made on any projects or programs. The main factor of omitting SEA is due to the fact that the funds needed are not reflected in the budget as the exercise requires mobilizing private sector professional. In the future, the Policy on Development Policy Planning needs to clearly define the coordination of strategic issues.

Although, the SEA was omitted, the Environmental Impact Assessment were conducted at projects and programs level in accordance with the law. According to official statistical data of Ministry of Nature, Environment and Tourism (MNET), the number of EIAs carried out during 2014-2018 reached 2106 covering mining, infrastructure, agriculture, light industry and services sectors.

As compared with 2014, the number of detailed environmental impact assessments increased by 86.4% and of the approved EIA reports 55.6% in belongs to services, 18.2% in mining and 17.6% in agriculture, manufacturing and the remaining 8.6% is the infrastructure project.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2017, awareness raised and capacity built of stakeholders that take part in the strategic environmental assessment
➢ By 2020, strategic environmental assessment in main economic sectors like agriculture, mineral resource extraction and processing, infrastructure is conducted.

There are still a number of subsidies and discounts in agriculture and mining sectors that can impact to biodiversity. However, there is no comprehensive analysis that assess the impact of these subsidies to the environment and biodiversity, which makes difficult for informed decision making on these subsidies and incentives.

Since 2012, the "Law on Environmental Impact Assessment" has begun to incorporate Strategic Environmental Assessment (SEA). The following procedures and procedures have been approved by the Minister of Environment and Green Development to support the implementation of the Law.

In accordance with the Law, the line Ministries who originates the policy, program and plan is tasked to carry out the SEA in these policy document and submit the documents to the Ministry of Environment and Tourism before submitting to the Cabinet. However, the SEA is lacking economic and legal backing which needs to be addressed to become effective.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/annex/details/6909?lawid=11359

https://www.legalinfo.mn/law/details/11644?lawid=11644

https://www.legalinfo.mn/law/details/12972?lawid=12972

https://www.legalinfo.mn/law/details/12973?lawid=12973

https://www.legalinfo.mn/law/details/9576?lawid=9576

https://www.legalinfo.mn/law/details/11003?lawid=11003

https://www.legalinfo.mn/law/details/8665?lawid=8665

Annor-Frempong, C. and Gunjal, K. (2015) Review, Estimation and Analysis of Agricultural Subsidies in Mongolia. World Bank. Washington DC.

National Program on Biodiversity (NPBDs), 2015

Чимэд-Очир Б. (2017). Биологийн олон янз байдлын үндэсний хөтөлбөрийг хэрэгжүүлэх санхүүжилтийн шийдэл, түүнийг хэрэгжүүлэх төлөвлөгөө. Ажлын тайлан. НҮБХХ, БИОФИН төсөл. Улаанбаатар.

Goal 12. Create a legal environment where subsidies or financial assistance are prohibited for use in agriculture, mineral resource extraction, infrastructure, energy, light industry, food manufacturing, and service industry projects and actions deemed to be harmful to or potentially harmful to biological diversity in accordance with environmental strategy evaluations.

Objective 25. Define and establish economic incentives to conserve and sustainably use biodiversity.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

In the context of existing laws in Mongolia, the economic mechanisms for protecting and proper use of the biodiversity have two-way regulation. First, polluter pays principle that require paying a fee if it pollutes the environment, such as water and air; Second, incentives for those who reports on illegal actions against biodiversity to the relevant state authorities and receive encouragement incentive if the information is correct.

Fee for pollution:

According to the Law on Fees for Water Pollution, citizens, economic entities and organizations that use water and mineral water resources and the pollute water quality shall pay water pollution. The fee size is subject to the type and quantity of pollutants in the water. The law was amended in 2017 to include changes in water pollution payments to the Environment and Climate fund use of the fee for the protection of water, water pollution, monitoring and restoration measures. The law also provides a specific incentive mechanism. For example, water pollutants are exempt from the following conditions:

- By the amount of waste water is cleaned up to the level of water quality standard;
- By the amount of grey water that was recycled and re-use the plant or service.

The Law on Air Pollution Payment is regulating since 2010 the issues around air pollutants, payment for air pollution, payment rates and exemptions. According to paragraph 8.1 of this law, if raw coals are used for deep coal processing and produced by a new type of fuel these are exempt from fee.

Incentive to report illegal activities:

According to Article 38.1 of the Law on Fauna, a person who provided assistance or information to a person who violated the Law on Fauna or provided information about it violated the Law on Fauna, the levy was awarded 15 per cent of the fines and reimbursements imposed by the violator.

The Forest Law and the relevant provisions of the Law on Environmental Protection also provide some incentives. These include:

- To encourage citizens, forest cooperatives, economic entities and organizations to mitigate adverse environmental impacts and to introduce advanced technologies;

- Provide incentives to citizens giving true information about violations of forest legislation;

- The incentives shall be granted to an official who has found the illegally timber crimes and violations.

There are recent proposals and initiatives from foreign projects, private sector and non-governmental organizations to develop and test alternative economic incentives for stimulating the sector to protect and effectively use of biodiversity. The MNET, MBA, Ministry of Finance, Green World Development Organizations have jointly established the Green Development Fund to support private sector and individual's initiative and investments for heat loss reduction, energy savings, and other environmentally friendly initiatives. There is a step towards creating a green loan product with low interest rate and flexibility.

The XAS Bank, Mercy Corps International Centre, and the Centre for Policy Research have pilot implemented soft loans for pastureland management under the "Green Pasture" project, which is being implemented in Bayan-Ovoo county of Khentii province in December 2018.

Other Banks such as Khaan Bank, also started considering to support herders who have complied with pasture carrying capacity through loans with low market interest rates. The UNDP-funded "Sustainable Value Chain Network" project aims to support long-term cooperation between cashmere value chain producers - herders and processors. The project aims to increase herders 'income by reducing pasture degradation by expanding herders' cashmere preparedness and quality, introducing a system of discriminatory assessment based on quality, expanding cooperation with the private sector and supporting inclusive businesses.

3. Other forms of incentives. The Government of Mongolia and the Ministry of Nature, Environment and Tourism have initiated some incentives to introduce other forms of incentives. In 2017, the Resolution No. 290 of the Government renewed the approval of the "Regulation on incentives for citizens, business entities and organizations introducing environmentally friendly technologies" and subsequently regulating them. For example:

- Issuance of "green certificate" to citizens, business entities and organizations that introduce environmentally friendly technology

- Eco-signage for products and services that reduce the adverse environmental impacts may result in further results.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

> ➢ By 2018, the economic instruments supporting the conservation and sustainable use of biodiversity is defined.
> ➢ By 2020, the economic instruments supporting the conservation and sustainable use of biodiversity is reflected in policies and legislations of the relevant economic sectors.

In the context of existing laws in Mongolia, the economic mechanisms for protecting and proper use of the biodiversity have two-way regulation. First, polluter pays principle that require paying a fee if it pollutes the environment, such as water and air; Second, incentives for those who reports on illegal actions against biodiversity to the relevant state authorities and receive encouragement incentive if the information is correct.

Despite the existence of a legal framework for economic mechanisms that promote the protection and proper use of biodiversity, there is a lack of comprehensive research on the status of their implementation.

There are some initiatives that have been implemented with private sectors, notably with commercial Banks to support initiative and investments for heat loss reduction, energy savings, and other environmentally friendly initiatives.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/8684

https://www.legalinfo.mn/law/details/30

https://www.legalinfo.mn/law/details/8670

https://www.legalinfo.mn/law/details/12171

https://www.legalinfo.mn/law/details/8935

https://mba.mn/sustainable-finance-in-mongolia-mn/

Энх-Амгалан, А. (2019). *Хэнтий аймгийн Баян-Овоо суманд мал аж ахуйн хөгжлийн шинэ загвар нэвтрүүлж байна*. Өдрийн сонин 2019.02.25, №038, 039 (61398 6140). Улаанбаатар: Бодлого судлалын төв, www.cpr.mn.

Goal 13. Taking into account the value and importance of pasture, water resources and forest ecosystem services, develop and implement a framework for sustainable use and conservation of natural resources in which social and economic benefits of these resources are appropriately protected.

Objective 26. Improve legal environment for proper value and assessment of ecosystem services.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

In Mongolia, laws and regulations that apply to land fees, air pollution, hunting and hunting permits, use of water and mineral water resources, fees for use of natural plants, and timber and timber are related to fees for ecosystem services.

The <u>Law on Natural Resource Use Fees</u> regulates the use of flora, water, forest and wildlife resources. According to the law:

- ✓ Payment for use of very rare, rare and abundant plants;
- ✓ Water used for drinking, household and industrial purposes; water for mining industry; mineral water used for treatment, nursing, heating and industrial and service purposes; fees for water and springs used for production or services such as energy generation, transportation and water animals and plants;
- ✓ Payment for use of all types of wood, wood and non-timber resources for the use of nuts, mushrooms, pitch, firewood, branches, seeds, and birch;
- ✓ Hunting and trapping for household purposes; fees charged for hunting, capturing, and hunting for industrial purposes.

The law also stipulates the minimum and maximum amount of payment for use of the above-mentioned royalty as well as the exemption and exemptions from the petition.

<u>There is no effective policy and action on the sustainable use and management of pastureland resources in Mongolia despite the fact that</u> Mongolia's traditional livestock husbandry sector is foundation of rural livelihoods and biodiversity conservation. Currently pastureland protection and utilization relations are defined in Article 52 of the Land Law.

Pastureland in Mongolia is expected to decline year by year due to urbanization, industrialization and mining development. For example, 130 million hectares in 1945, 122.1 million hectares in 1964, 122.7 hectares in 1989, 113.3 million hectares in 2008 and 110.5 million hectares in 2018. The size of pasture and hayfields in Mongolia has decreased by 12.2 million hectares (9.9 points) compared to 1989, when the transition to a market economy.

In the 30 years of transition, the number of livestock in Mongolia has almost tripled, the number of livestock per 100 ha pasture land increased 2.3 times (the grazing pressure), the number of herders increased 2.2 times and number livestock per herder increased by 26.6 percent. These figures show that the grazing pressure of our country has increased dramatically in the short run.

Income from pastoral livestock husbandry in Mongolia depends on three factors: depending on the number of livestock, the productivity of the livestock and, the commodity prices at market. Over past decades the livestock unit's profit has been decreasing, and the price of the commodity is not increasing, and thus, herders are primarily covering their needs and livelihoods by raising their livestock transferring all risks to the pastureland using the loopholes in pastureland management.

Pasture protection issues are essentially omitted. MPs have drafted the Pastureland Law many times since the mid-1990s and attempted to discuss the Parliament. The MOFALI established a working group to draft the Pastureland Law in 2017 and drafted a draft law and concepts, but was not

submitted to the State Great Khural. Consequently, there is no legal environment for the protection and proper use of pastureland resources.

The tourism sector in Mongolia also fully rely on ecosystem services and also has a significant impact on the burden of protected areas with forest and water reservoirs, without re-investment to the ecosystem they rely. According to the Ministry of Nature, Environment and Tourism, in 2018, 58.0 thousand people in the tourism sector account for 4.9 percent of total employment. In 2014, there were 65.6 thousand foreigners and 299.2 thousand domestic tourists who visited the Protected Areas in Mongolia. As of 2018, 81.9 thousand foreign tourists and 380.6 thousand local tourists visited Protected Areas, an increase of 26.9% in four years' time. Despite the increasing visitors, there is no evidence that return of the fees from tourists for re-investment for PAs.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2016, assessment of the current legal environment is performed.

In Mongolia, laws and regulations that apply to land use fees, air pollution, hunting and hunting permits, use of water and mineral water resources, fees for use of natural plants, and timber and timber substitutes the payment for ecosystem services. However, the legal environment for monetizing diverse and indirect ecosystem services is not in place despite some study reports and recommendation prepared by international development agencies. Therefore, the implementation of well integrated PES in Mongolia require revision of law and by-law to reflect these recommendations.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/8663

https://www.legalinfo.mn/law/details/216?lawid=216

https://www.legalinfo.mn/law/details/9687

Report of State of the Mongolian Environment, 2015-2016. (2017). Ministry of Environment and Tourism. Ulaanbaatar.

Report of State of the Mongolian Environment, 2017-2018. (2019). Ministry of Environment and Tourism. Ulaanbaatar.

Монгол Улсын статистикийн эмхэтгэл, YCX, 2000-2017

Бакей, А. (2016). Монголын бэлчээрийн мал аж ахуйн тогтвортой хөгжлийн зарим асуудал. УБ. 204 дэх тал

Ганзориг Г. нар. (2015). Хан Хэнтийн дархан цаазат газрын экосистемийн үйлчилгээний үнэ цэнэ ба цаашдын хандлага.

Тусгай хамгаалалттай газар нутгийн экосистемийн үйлчилгээний салбарын хөгжилд оруулж буй хувь нэмэр буюу эдийн засгийн үнэ цэнэ: судалгааны тайлан. (2014) НҮБХХ, БОАЖЯ.

Монгол Улсын статистикийн эмхэтгэл, YCX, 2018 он

Goal 13. Taking into account the value and importance of pasture, water resources and forest ecosystem services, develop and implement a framework for sustainable use and conservation of natural resources in which social and economic benefits of these resources are appropriately protected.

Objective 27. Develop and implement program to introduce payment for ecosystem services (PES).

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Mongolia's Green Development policy aims to "create mechanisms for incentives for ecosystem services to compensate herders who are initiated to prevent pasture degradation, including livestock breeding and herding for water sources and springs in remote areas." The value of pastoral reserve ecosystem services in Mongolia is not officially established. However, the ecological and economic assessment of plants has been identified. Article 14.1 of the Law on Natural Resource Use Fees payments for use of natural plants (as a percentage of ecological and economic value); The rates of use of water and mineral water reserves by 15.1 and 15.2; Article 16, royalty rates for use of forest resources; Article 17 stipulates hunting and use royalty rates. Paying for the collection of natural plants has been established.

According to the Order # A-282 of the Minister of Nature, Environment and Tourism, "Ecological and economic assessment of rare and rare species". Also, "Ecological and economic assessment of fauna" and "Ecological and economic assessment of water" were renewed in 2014 and approved by Government resolution. Furthermore, the methodology for estimating environmental damages has been revised.

The Resolution 152 of the Government of Mongolia in 1997 approved the "Baseline cost estimation and minimum fees for one hectare of agricultural land for each agricultural zone" and the basis for pasture and hay assessments was different for all four zones, namely, Altai, Khangai, Gobi and Steppe taking into account the different nature and economic conditions of each zone.

Report on "Regional Ecosystem Based Adaptation Action" prepared by the UNDP funded project "Implementation of Ecosystem-Based Adaptation Action Plan for High Risk Management in River Basin" assessed the vulnerability of water, pasture and forest ecosystem to the Altai Mountains, Great Lakes Depression and the Eastern Steppes and Mongol Daguur areas and provided recommendation on supporting ecological services and benefits to ecosystems.

In 2011, The Ministry of Nature, Environment and Tourism (MNET) and the World Bank's conducted a survey on the feasibility of introducing the principle of payment for ecosystem services in Mongolia. The project reviewed the rationale and use of ecosystem services fees and the developed roadmap for introducing PES in Mongolia. It also assessed the economic value of the Upper Tuul ecosystem and identifies ways to introduce PES for Tuul river.

The Action Plan for the National Biodiversity Action Plan is designed to develop criteria for the establishment of ecosystem service fees in cooperation with MNET and international organizations in 2019-2020, but the work has not commenced yet.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2018, PES indicators for sectors that support biodiversity are identified.
➢ By 2020, PES program is developed by performing economic assessments of PES in accordance with environmental zones and improving the indicators.

Introduction of the Payment for Ecosystem Services are limited to the application of regulatory framework for the Law on Natural Resource Use. However, the legal environment for assessing and monetizing indirect ecosystem services is not in place despite some study reports and recommendation prepared by international development agencies. Therefore, the implementation of well integrated PES in Mongolia require revision of law and by-law to reflect these recommendations to cover PES in different productive sectors.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

Ногоон хөгжлийн бодлого. (2014). Монгол Улсын Их Хурлын 2014 оны 43 дугаар тогтоолын хавсралт. 3.4.7 дугаар зүйл.

Монгол орны байгаль орчны төлөв байдлын тайлан, 2015-2016 он. (2018). Байгаль орчин, аялал жуулчлалын яам. 31-32 дахь тал.

Энх-Амгалан, А. (2017) "Бэлчээр ашиглалтын төлбөр нэвтрүүлэх арга зүй". НҮБХХХ, БИОФИН төсөл. 3 – 5 дахь тал.

Эрдэнэсайхан, Н. (2011). "Экосистемийн үйлчилгээний төлбөрийн зарчмыг Монгол Улсад нэвтрүүлэх боломж" судалгааны ажлын тайлан. Дэлхийн Банк.

Goal 14. Identify potential sources of funding that are needed to implement the national biodiversity program and create a framework for efficient use of these funds.

Objective 28. Include environment-related indicators into all special government funds that affect directly and indirectly the biodiversity

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

The Law on Government Special Funds was first adopted by the Parliament in 2006 and Chapter 1; Chapter 2 contains a special fund type and analytics; Chapter 3 regulates endowments and disbursements; Chapter 4, the procedure for granting funds from special funds; Chapter 5 provides reporting and monitoring; and, Chapter 6 regulates other issues. Unfortunately, this important law have been revised most frequently due to populist politics, and its provision and scope has become the most unstable in the Country. The law foresaw establishment of the following special funds for real economic sectors and the environment:

- Environment and Climate Fund;

- Small and Medium Enterprise Development Fund;

- Government reserve fund;

- Livestock protection fund;

- Funds for seed multiplication;

- State Road Fund;

- Employment Promotion Fund;

- Scientific and Technological Foundation;

- Fund for Vocational Education and Training;

- Production Development Fund;

- Fund against air pollution.

In 2015 seven special funds including Fund for Renewable Energy was closed and 2019, the decision was made by the Government to close the Fund for Development Fund, the International Cooperation Fund, the Air Pollution Mitigation Fund, and decided to consolidate Farming, Livestock Protection and Small and Medium Enterprise Funds.

The By-law on the establishment and disbursement of the Environmental Protection Fund included indicators of environmental-friendly intervention. All other funds except for the Environment and Climate Fund and Air Pollution Fund are aimed at narrow economic development of a particular sector and funding guidelines have no selection criteria for environmental protection. The National Audit Office concluded that in 2014-2016, a compliance audit in some government special funds was found to have been a common violation of the fund's mismanagement and lack of internal control activities.

In 2014, Government of Mongolia adopted regulation on "Procedures on the mobilizing some portion of revenues and its spending and reporting for environmental protection and restoration measures ". The purpose of this regulation is to mobilize portion of the revenues generated under the "Law on Natural Resource Use Fees" at the *aimag,* capital city, *soum* and district budget (natural land, water, mineral resources, forests, wildlife resources, land use areas), and regulate relations concerning the planning, spending, reporting and monitoring of these revenues for environmental protection and restoration measures. According to the Ministry of Nature, Environment and Tourism (MNET), under of the Law on Natural Use Fees, during 2016-2018, MNT 77.4 billion per year was generated. However, only 10.2 billion MNT were spent in line with the provision, and thus, the implementation of this law was assessed at 36.9%.

Under the "Biodiversity Financing Initiative" project of UNDP, an assessment was made on the financing of biodiversity in Mongolia using the the Workbook Methodology. The assessment showed that funding for biodiversity increased to US $ 207.7 million during 2008-2018, accounting 0.35% - 0.79% of total state budget or 0.15% -0.25% of GDP. 44.4% of the total expenditure came from the state budget and 55.6% came from donor and international organizations.
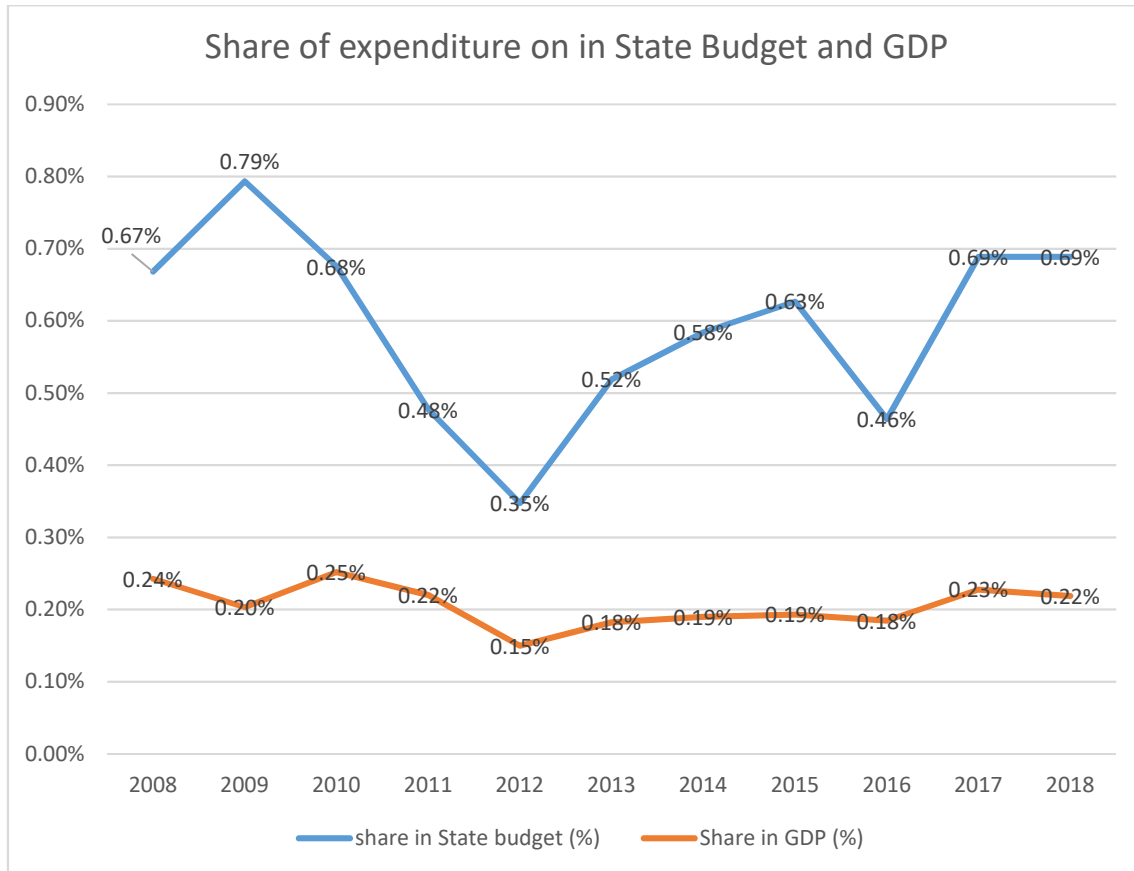
Source: Oyunchimeg T. Biodiversity expenditure report 2008-2018.

Figure 16. Trends in biodiversity expenditure in Mongolia

At the national level four major sources constitute the revenue from the natural resources use.

Table 16. The total budget revenue of Mongolia and the share of natural resource revenues

(in billions MNT)					
Revenue type	2014	2015	2016	2017	2018
Total Revenue, grants	4244.3	3834.0	3854.0	5832.9	7563.1
1.Fee from special permission for mining exploitation and explorations	44.3	37.3	34.8	37.8	38.9
2. Fee for use of mineral resources	173.3	180.6	101.0	192.6	320.6
3. Reimbursement of mineral deposits explored by the State budget	1.8	2.4	1.7	4.5	3.0
4. Fee for Air pollution	32. 6	13.9	19.4	36.6	42.1
Sum of above four types of revenues (1+2+3+4)	252.0	234.2	157.0	271.6	404.6
Share in Total Revenue by those four types NR based revenues, %	5.9	6.1	4.1	4.7	5.3

Source: Statistical Yearbook of Mongolia, NSO, 2014-2017

The annual average revenues amounts for MNT263.9 billion, which constitutes 5.0 percent of the state budget revenue. The royalty constitute major share of fees among the above-mentioned natural resource taxes that generate state revenues, accounting for an average of 193.6 billion MNT per year.

At the local level, land fees, fees for use of natural resources and waste service fees play an important role.

Table 17. The fees and revenues generating local budget (in MNT million)

Revenue type	2014	2015	2016	2017	2018
1. Fee for waste management	13.2	16.0	15.9	17.8	18.9
2.Fee for using common mineral resources	3.1	4.5	1.7	2.4	3.6
3. Fee for special permission for using natural resources except mineral resources	0.3	0.4	0.4	0.1	0.0
4. Land use fee	65.5	59.6	53.4	62.2	66.9
5. Natural resources use fee	38.9	44.5	53.3	68.0	56.8
- Forest resources	3.0	3.7	4.3	10.6	4.0
- wild animal	1.0	2.4	3.3	4.9	5.6
- water and mineral water	34.3	35.7	40.6	47.7	46.7
- wild flora	0.5	2.8	5.1	4.7	0.5
Total (1+2+3+4+5)	121.1	125.0	124.6	150.6	146.2

Source: Statistical Yearbook of Mongolia, NSO, 2014-2017

For instance, on average 2014-2018 annual revenues from land fees ranging from 53.4-66.9 billion togrogs, 38.9-68.0 billion togrogs from natural resource use and 13.2-18.9 billion togrogs from waste management fee.

During 2013-2015, all fees for water, mineral resources, forest and wildlife resources and fees for natural plants amounted for MNT 120.8 billion in local budgets and of those MNT 63.4 billion were

expected to be re-invested for protection and rehabilitation under the law. However, the actual implementation has been only around 48.9-49.2%.

From 2007, first time the National Statistical Commission began to compile data on expenditures on protection and restoration of natural resources. The six categories of expenditure collected the Statistical office include: 1) centralized environmental interventions; 2) Environmental conservation fund; 3) Protected Areas; 4) reforestation and forestry; 5) measures for land protection and restoration; and 6) environmental rangers' activities. Although, the categories might be ineffective data analysis, it is seen a first step for sound reporting and monitoring.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective were:

➢ By 2019, assessment is made and conclusion is drawn on special government funds that directly and indirectly affect biodiversity.
➢ By 2019, environment-related indicators are included into the rules and regulations of special government funds that directly and indirectly affect biodiversity.

The Law on Government Special Funds was first adopted by the Parliament in 2006, However, this important law have been revised most frequently due to populist politics, and its provision and scope has become the most unstable in the Country. All Special Funds, except those of dealing with environmental issues, are aimed at narrow economic development of a particular sector and funding guidelines have no selection criteria for environmental protection and many of these Funds have mismanagement and lack of internal control issues.

The funding for biodiversity increased to US $ 207.7 million during 2008-2018, accounting 0.35% - 0.79% of total state budget or 0.15% -0.25% of GDP. However, 44.4% of the total expenditure came from the state budget and 55.6% came from donor and international organizations.

Funds generated under the Law on Natural Use Fees, have not been fully used as per law provision and the implementation of this law was assessed at 36.9%.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/278

Байгалийн нөөц ашигласны төлбөрийн орлого, зарцуулалтын мэдээ, БОАЖЯ,

Засгийн газрын зарим тусгай санд хийсэн нийцлийн аудит. (2017). Үндэсний аудитын газар.

Монгол Улсын статистикийн эмхэтгэл, ҮСХ, 2014-2017 он

Оюунчимэг, Т. (2019). Биологийн олон янз байдлын зарцуулалтын шинжилгээний тайлан 2008-2018. НҮБХХ, БИОФИН төсөл. 15 дахь тал

Goal 14. Identify potential sources of funding needed to implement the national biodiversity program and create a framework for efficient use of these funds.

Objective 29. Identify and implement funding sources such as PES and biodiversity offset for protection of biodiversity.

Describe a measure taken to contribute to the implementation of your country's national biodiversity strategy and action plan

Article 3.1.11 of the "Law on Environmental Impact Assessment" approved by the State Great Khural of Mongolia in 2012 states that "biodiversity offsets should be compensated for by biodiversity loss or loss of habitat by project activities protection measures ".

Biodiversity offset conservation measures are implemented in most countries on a voluntary basis, but in Mongolia it is legalized. Biodiversity offset measures are a relatively new concept in Mongolia and have not been implemented since the adoption of the law. However, UNDP has implemented a GEF-financed land degradation and development on western Mongolia is expected to provide some lesson and best practices that could strengthen the existing legal framework. Furthermore, the Ministry of Nature, Environment and Tourism has begun renovating relevant regulations and procedures related to offsets.

Analyses of EIA reports show following pattern with regards to implementation of biodiversity offset in Mongolia.

1. Review of the 217 project (EIA reports) conducted in 2014-2017 showed 94 projects or 43.3% of the reports taken into account the biodiversity off-set measures. The remaining 123 projects (56.6%) did not include biodiversity offset related measures.

2. In-depth analysis of 94 projects that has include biodiversity off-set measures showed only 30 (32%) of the projects have developed the off-set measures in accordance with approved methodologies. Remaining 64 projects lack sufficient data and planning and therefore adequate biodiversity off-set measures cannot be developed from the EIA report.

3. Very few detailed EIA have identified the potential biodiversity off-set sites and conducted baseline study ion the selected area. This is because planning, identification of interventions, validation and approving require series of multi-stakeholder consultations and needs sufficient time allocation. Two-phased approach that require clearly identified geographical and intervention scopes and budget at detailed EIA stage and detailed intervention plan at the first years of project implementation might streamline the process.

4. It is observed that the detailed EIA reports often did not follow the methodologies for identification of biodiversity off-set areas and spatial analysis. Therefore it is recommended to build capacities of EIA companies.

5. While the impact of transport on coal and iron ore mining projects is high, The current regulatory framework do not cover this area.

6. One mineral deposit is split between several entities. It is necessary to establish a legal environment or regulation for coordinating and managing the conservation, design, implementation and implementation of such projects.

For the implementation measure, please indicate to which national or Aichi Biodiversity Target(s) it contributes

Assessment of the effectiveness of the implementation measure taken in achieving desired outcomes:

☐ Measure taken has been effective
☒ Measure taken has been partially effective
☐ Measure taken has been ineffective
☐ Unknown

Please explain the selection and where possible indicate the tools or methodology used for the assessment of effectiveness above

The NPBD's expected midterm output under this Objective was:

➢ By 2018, create a legal environment enabling environmental offset activities.

Biodiversity offset measures are a relatively new concept in Mongolia and have not been implemented since the adoption of the Law. The Law provisions covering biodiversity off-set and related by-laws are still needs to be refined based on lessons and best practices.

Relevant websites, web links and files (Please use this field to indicate any relevant websites, web links or documents where additional information related to this assessment can be found).

https://www.legalinfo.mn/law/details/8665?lawid=8665

Уул уурхайн хөгжлийг байгаль орчинд нөлөө багатай төлөвлөх ба иргэдийн оролцоо. (2018). TNC-н Монгол дахь Хөтөлбөр, НҮБХХХ

III. Assessment of progress towards each national target

The progress of implementation of National Program on Biodiversity for 2015-2025 (NPBD) was reviewed by a team of eight independent experts that carried out in depth assessment during January – April 2019. The findings of the experts were presented to wider stakeholders group on 11 April 2019, involving representatives from Sectoral Ministries, Academy, Universities and NGOs. A follow-up experts' group consultation was held on 14 May 2019 and each NPBD Goals and their contribution to the Aichi targets were reviewed and cross-checked by sectoral experts. Using the recommendation from the report template, the experts team have developed following scores to assess Mongolia's performance towards implementation of National strategy and its contribution to the Global Strategic Plan for Biodiversity 2011-2020 (Aichi targets).

Table 18. Mongolia's scoring system for assessing Aichi and NPBD progress

Level of Progress	Score
On track to exceed target	5
On track to achieve target	4
Progress towards target but at an insufficient rate	3
No significant change	2
Implementation not started yet	1
Irrelevant	0

In this scoring system the performance indicator "Moving away from target" and "Unknown" were replaced by "Implementation not started yet" and "Irrelevant" taking into consideration the fact that Government approved Action plan can't not altered and some of the Achi targets such as ocean and corals are irrelevant to Mongolia.
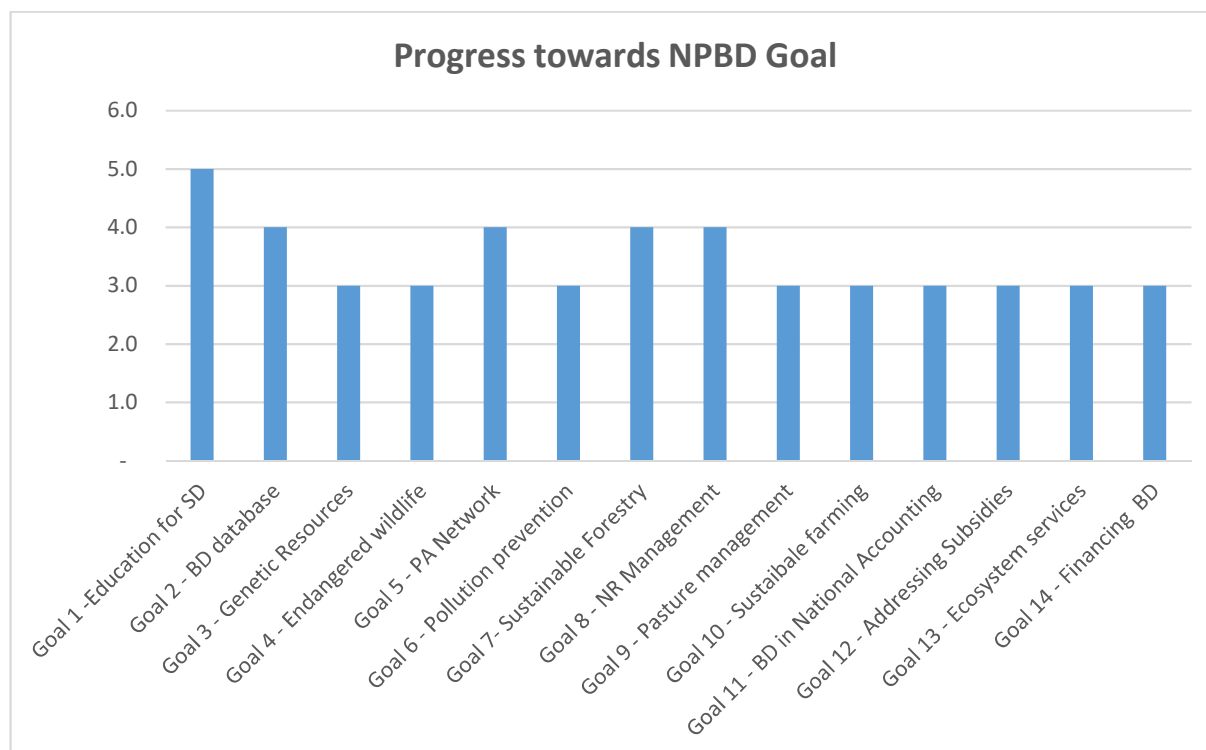
Figure 17. Mongolia's progress on implementation of NPBD
(5 – On track to exceed target; 4 – On track to achieve target; 3 – Progress towards target but at an insufficient rate; 2 – No signification change; 1 – Implementation not started yet; 0 – Irrelevant)

Assessment of the progress show that Mongolia's moving strongly towards promoting SD concept and it is already embedded at all level of education systems, although there are still some rooms remain for improvement.

Similarly, country is strongly progressing for the establishment and proper management of PA network. Despite fact that Mongolia has as of May 2019 established PA network over 20.01% its territory, going beyond the global commitment, the management and financial sustainability of these PA network require more support.

Creating sound legal environment for conservation and sustainable management of natural resources including forest resources and wildlife and promotion of community based community based natural resources management were another area where Mongolia had succeeded. As of 2018, Mongolia had established 171 hunting areas altogether and these areas are managed by 25 CBOs, 7 local NGOs and 11 companies, thanks enabling environment that empowers local communities. In forestry sector, 3,345.4 thousand hectares of forest area being managed by 1281 Forest User Groups in addition to 90 private sector that manage 681.4 thousand hectares of forested area, and thus, diversifying forestry management solely run by the government.

The progress on the other nine Goals desires more robust intervention and among those the Goal 9 - Taking into account grazing capacity and livestock population size, utilize legislative and economic leverages in order to reduce pasture degradation by up to 70% and increase quality of existing pastures on pasture management and Goal 12. Create a legal environment where subsidies or financial assistance are prohibited for use in agriculture, mineral resource, infrastructure, energy, light industry, food manufacturing, and service industry projects and actions deemed to be harmful to or potentially harmful to biological diversity in accordance with environmental strategy evaluations needs special attention to meet its objectives.

For the assessment of the Goal the stakeholders and consultants have used the NPBD Goal level indicators that can be found in the document itself (https://www.cbd.int/doc/world/mn/mn-nbsap-v2-en.pdf).

Three level of assessment of experts finding through a) peer review, b) wide stakeholder consultation, and c) sectoral experts level review provide solid assurance that findings and assessments are carried out and crosschecked thoroughly.

Detailed scoring of each targets can be found in the Summary table annexed to the report (Annex 1).

IV. Description of the national contribution to the achievement of each global Aichi Biodiversity Target

Contribution to the achievement of each global Aichi Biodiversity Target

Mongolia's contribution towards the achievement of global Aichi Biodiversity Target was reviewed by a team of eight independent experts that carried out in depth assessment during January – April 2019. The findings of the experts were presented at the experts' group consultation that was held on 14 May 2019 and each NPBD Goals and their contribution to the Aichi targets were reviewed and cross-checked by sectoral experts. The experts' team have used the same scorecards described in previous section (table 18) and assessed Mongolia's contribution to the global Aichi Biodiversity Targets.

The NPBD for 2015-2025 was prepared following the setting up global Aichi Biodiversity targets. As such the strategy aimed to integrate the country needs and Mongolia's commitment to the global biodiversity conservation to the maximum extent. The participatory assessment carried out by the independent consultants and sectoral experts show that the NPBD aim to support global conservation goal has been well woven into the national action plan and implantation of the NPBD enabled the country to support 18 of the 20 Aichi targets. Two targets, namely, Target 6 and Target 10, which deals with fishery and coral reefs were left because Mongolia's impact on those targets are negligent.
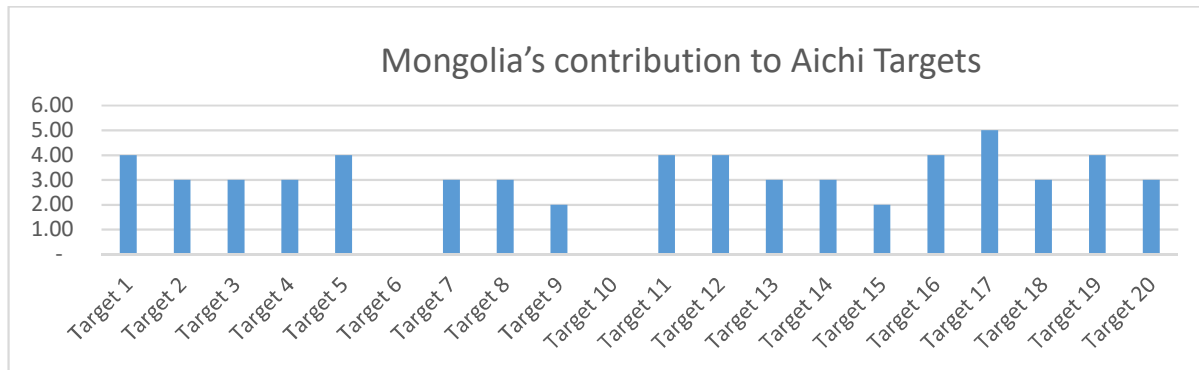
Figure 18. Mongolia's contribution towards the achievement of Aichi Targets
(5 – On track to exceed target; 4 – On track to achieve target; 3 – Progress towards target but at an insufficient rate; 2 – No signification change; 1 – Implementation not started yet; 0 – Irrelevant)

Reflecting the success described in Session III, Mongolia is assessed itself strongly in increasing people's knowledge on value and benefits of biodiversity thanks to strong move towards education for Sustainable development and thus scored itself strongly contributing to Aichi Target 1. Mongolia also assessed itself strongly contributing in conservation of Forest habitats hence scored high Aichi Target 5.

It also scored high in Aichi Target 11 because, Country had set a goal to dedicate 30% of its territory to Protected Area Network since the Rio Conference and had already established State Protected Area network covering 20.1% of its territory, which equal to entire territory of Poland. Thanks to conservation paradigm shift towards "users are the stewards" Mongolia is moving towards enabling the local communities to take over conservation and sustainable management of wildlife and other natural resources in their area. This also has enabled the country to self-assess highly to contributing Aichi Targets 12, 16 and 19.

Detailed analysist show that if Mongolia's performance assessed at level of Aichi indicators, of the 225 global Aichi indicator Mongolia is contributing for the achievement of 129 indicators of which 48 are generic indicators and 81 are specific indicators. Detailed scoring of each targets can be found in the Summary table annexed to the report (Annex 1).
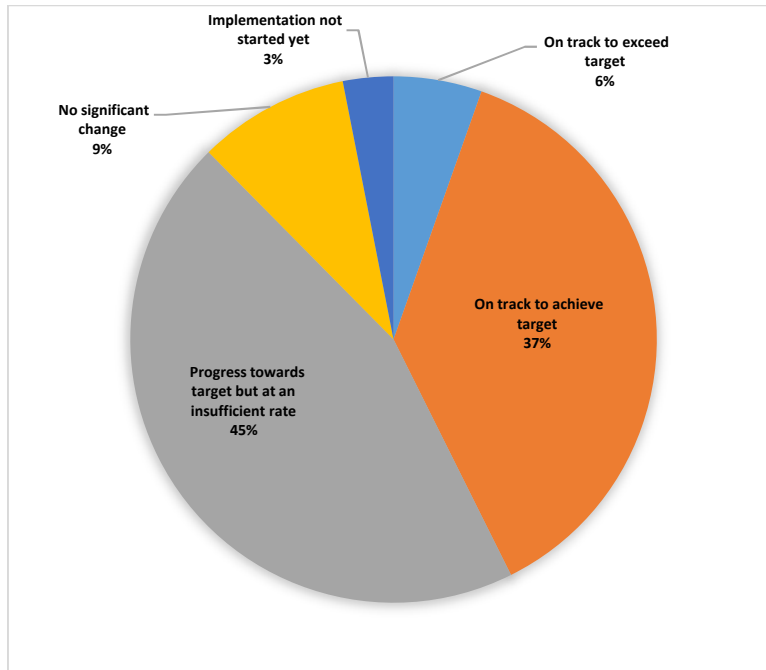
Figure 19. Mongolia's contribution to Aichi Biodiversity Targets at generic indicators level

The assessment show that as of 2018, Mongolia's contribution to the Aichi Targets has been solid, with 6 percent of targets indicators being "on track to exceed target set by the country and 37% or 48 indicators supporting the Aichi target being "on track to achieve target" and 45% are in is progressing to achieve the target.

Contribution to the achievement of Sustainable Development Goals

In parallel to contributing to the Aichi targets, the Mongolia's Biodiversity Programme directly contribute 25 targets of the six SDGs.
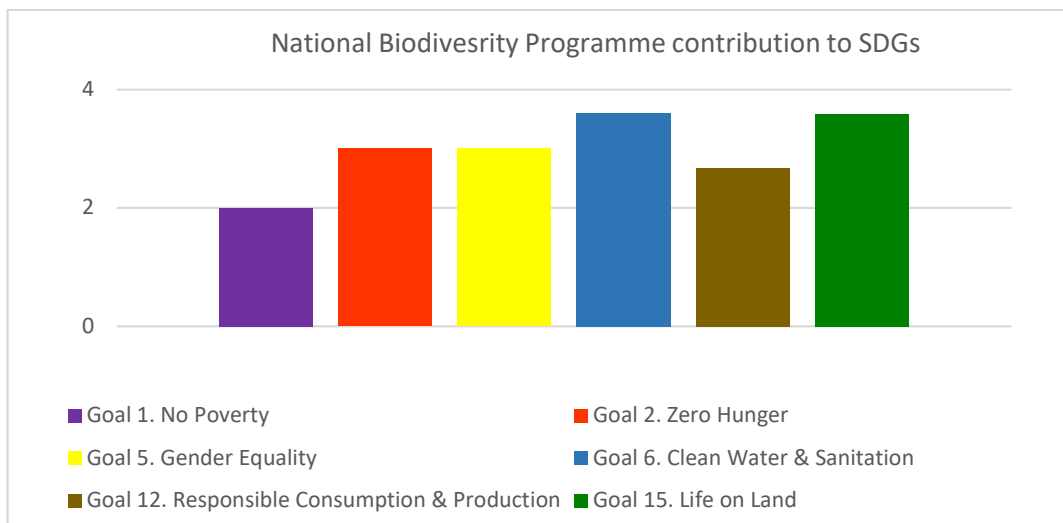
Figure 20. Mongolia's contribution towards the achievement of Aichi Targets
(5 – On track to exceed target; 4 – On track to achieve target; 3 – Progress towards target but at an insufficient rate; 2 – No signification change; 1 – Implementation not started yet; 0 – Irrelevant)

The assessment show that 10 of the 14 Goals of NBP, namely Goals 4-7 and 10-14 are directly contributing meaningfully to Goal 1 - by addressing land equal and fair access to land; Goal 2 – by addressing unsustainable subsidies to the agricultural sector, sustainable agriculture and management of plant and animal genetic resources; Goal 5 – by addressing local community empowerment for rangeland management; Goal 6 – by addressing water quality, IRBM & protection of headwaters; Goal 12 – by addressing harmful subsidies and financial assistances to the productive sector and promoting PES principles; and Goal 15 – addressing PA network, sustainable NRM and genetic resources, land degradation and targeted conservation of threatened species.

The assessment on performance (Figure 20) showed that NBP contribution to SDG 6&15 are rated as "On track" and contribution to SDGs 2, 5 & 12 are rated as "Progress towards target but at an insufficient rate" and contribution to SDG 1 is rated as "No signification change" due to the fact that Mongolia is failing to create enabling legal environment for sustainable pastureland management for the past decades.

V. Updated biodiversity country profiles

National Flower of Mongolia –Blue pincushion (*Scabiosa comosa* Fisch.)

Photo credit: S. Gombobaatar, Mongolica Publishing

Flora
Vascular plants

A pioneering list of vascular plants in Mongolia and "Identification Book of Vascular Higher Plants in Mongolia" were produced by V.I.Grubov, a well-known Russian scientist, in 1995 and in 1982, respectively. N. Ulziikhutag, a national scientist (1989) recorded a total of 2,443 species belonging to 625 genera of 122 families of flora in Mongolia in his book "Overview on Flora in Mongolia", while I.A. Gubanov, a Russian scientist, (1996) recorded 2,823 species and sub-species of 662 genera of 128 families of vascular plants in his book "Conspect of Flora in External Mongolia". The publication "Records of Vascular Plants in Mongolia" jointly released by the Institute of Botany under the Mongolian Academy of Sciences (MAS) and a team of Botanists of the Department of Biology at the Mongolian National University (NUM) in 2014 listed a total of 3,127 species and sub-species (including 131 sub-species and 32 variations) belonging to 683 genera of 112 families, 39 orders of 14 classes of five phyla of three sub-flora (Polypodiophyta, Gymnospermae, and Angiospermae) from flora in Mongolia (Urgamal et al., 2014). It also includes details on names, taxonomy, distributions, and conservation status of the species. This publication is specific with that there were 412 species and sub-species of 21 genera of one family newly recorded, changes made in Mongolian names of about 480 species of 62 genera, and about 2,700 distribution range points of approximately 1,250 newly recorded species, in about 20 years, when I.A. Gubanov (1996) released the inventory publication aforesaid.

As of 2013, there were 3,014 species belonging to 676 genera of 112 families of 39 orders of 14 classes of five phyla made up the vascular higher plants in Mongolia (Urgamal *et al.,* 2013). In five years later or in 2018, there were 3,163 sub-species and species of 684 genera of 39 orders belonging to five phyla of three sub-floral forms (Polypodiophyta, Gymnospermae, and Angiospermae) recorded under the vascular plants in Mongolia. Mongolian names of 3,163 sub-species and species recorded under the flora in Mongolia were identified based on the publications by Banzragch (1965), Grubov (1982), Ulziikhutag (1984, 2003), Ligaa et.al, (2008, 2009), Manibazar (2010) and Urgamal & Oyuntsetseg (2017). Furthermore, Mongolian names of 702 plant species were identified at decisions of Sub-Committee of Taxonomy of Vascular Plants in Mongolia (Urgamal et.al, 2019).
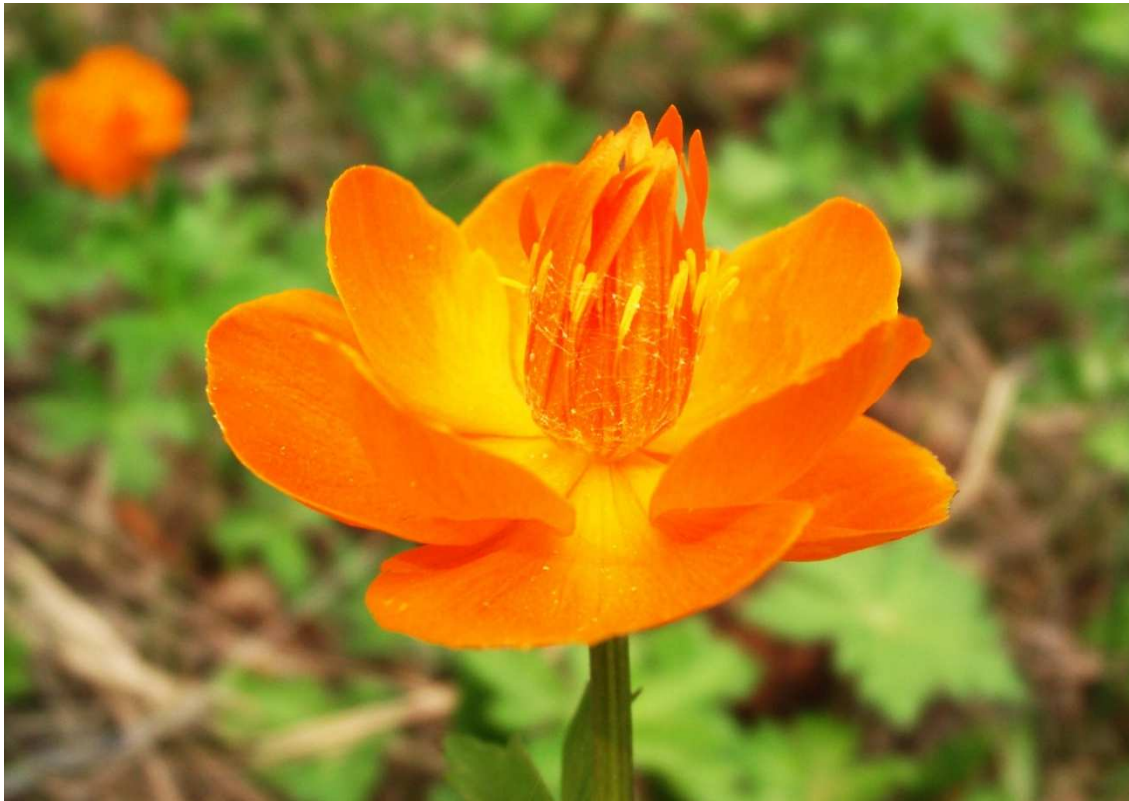
Globe-flower (*Trollius asiaticus* L.)

Photo credit: S. Gombobaatar, Mongolica Publishing

Numbers of vascular plant sub-species and species were increased in comparing the previous researches (Table 1). Reduced numbers of families, as shown in the table below, have been obtained as a result of the changes in taxonomy of the vascular plants.

Table 1. Changes in numbers of vascular higher plant species in Mongolia

Taxon	1955	1982	1989	1996	2005	2009	2010	2013	2018
Family	97	103	122	128	130	134	132	112	108
Genus	555	599	625	662	666	~ 680	~ 680	676	684
Species	1,897	2,239	2,443	2,823	2,930	2,946	2,950	3,014	3,163

The largest Mongolian plant families include *Asteraceae* (451 species), *Fabaceae* (349 species), *Poaceae* (257 species), *Rosaceae* (156 species), and *Brassicaceae* (149 species), while the genera with abundant species are *Astragalus* (128 species), *Artemisia* (105 species), *Oxytropis* (97 species), *Carex* (92 species), and *Potentilla* (69 species) (Table 2) (Urgamal *et al.,* 2013).

Table 2. The largest plant families in flora in Mongolia

Family	Number of genus	Number of species	Percentage
Asteraceae	84	451	14.95
Fabaceae	27	349	11.57
Poaceae	62	257	8.52
Rosaceae	28	156	5.17
Brassicaceae	58	149	4.94
Cyperaceae	13	132	4.37
Ranunculaceae	21	131	4.34
Lamiaceae	24	101	3.34
Amaranthaceae	28	99	3.28
Caryophyllaceae	21	91	3.01

Significant changes have been seen in flora species and their numbers in Mongolia for last three decades. Regarding the major species groups, there were 232 species of higher fungus, 1,366 species of algae, 81 species of lichen, 176 species of moss, and 684 species of vascular plants newly recorded. As such, the flora species composition in the country has increased by 2,815 additional species or about 40 percent during the last 30 years. Currently, there are 7,315 plant species recorded in Mongolia (Report on State of the Environment of Mongolia, 2015-2016).

Among the vascular plants grown in Mongolia, there are 120 endemic species, 532 sub-endemic species (Urgamal & Oyuntsetseg, 2017), 133 very rare species, 356 rare species, 51alien species (Gombobaatar et al., 2018), 438 antropophilus species, 186 water or aquatic species, 70 relict species (Urgamal, 2018), 47 cultivated plant species going wild (Urgamal et al., 2014), 135 species listed in the

Red Book of Mongolia (2013), 148 species listed in the Red List (2011), and eight species listed in the CITES Appendices (Urgamal, 2018).

The publications of "Mongolian Plant Family" serious of field books, which are based on years of research studies, have begun. These books are valuable to not only Mongolia, but global botany research. Currently, series 10 and 17 have been published. These books feature overviews of 204 species of 49 genera of three families, which include taxonomy, identification keys, and detailed information of the species, vegetation periods, habitats or distribution ranges within Mongolia (Urgamal, 2018; Report on State of the Environment of Mongolia, 2015-2016).

Under the Global Taxonomy Initiative of the Convention on Biodiversity, a Sub-Committee of Vascular Plant Taxonomy was established in 2018 at initiative of S. Gombobaatar and support by national researchers, namely, S. Bayakhuu, D. Ariuntuya, M. Urgamal, B. Oyuntsetseg, and others. The Sub-Committee plays a vital role in discussion and agreement on many issues related to taxonomy and compositions of plant species.

At a request and some funding from the Ministry of Environment and Tourism (MET) and financial support from the Zoological Society of London (ZSL), a project "Red List of Plants in Mongolia" was implemented and the Second National Workshop on Red List of Plants was organized under the project in 2018 at supervision of S. Gombobaatar and inputs of numerous national researchers, namely M. Urgamal, B. Oyuntsetseg, R. Tungalag, V. Gundegmaa and other researchers and botanists from the NUM, Mongolian Academy of Sciences (MAS), and Mongolian State University of Education (MSUE). During this workshop, a total of 489 species of vascular plants occurring in Mongolia were assessed by IUCN Red List Criteria. According to the assessment, there were 31 Critically Endangered, 109 Endangered, 164 Vulnerable, 78 Near Threatened species, 42 species Least Concern, 60 species Data Deficient, and five species Not Applicable. Among a total of 637 vascular plant species in Mongolia assessed by IUCN Red List Criteria in 2011 and 2019, there were 47 Critically Endangered, 148 Endangered, 217 Vulnerable, and 100 Near Threatened species, 52 species Least Concern, 64 species Data Deficient, and seven species Not Applicable. Among the vascular plant species assessed by the Red List Criteria in 2011 and 2019, there were 195 Critically Endangered and Endangered species. Thus, the Government of Mongolia aims to include the 195 critically endangered and endangered species in the List of Very Rare Plants and 217 Vulnerable species in the List of Rare Plants. Justifications and supplementary details necessary for inclusion of 412 vascular plant species in the Lists of Very Rare and Rare Plants are being prepared for submission to the Government of Mongolia for approval (Nyambayar et,al., 2012; Urgamal et al., 2019).

A project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" was implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with a request of the MET. Under this project, a database was established for 471 medicinal plant species along with details on their identification keys, vegetation periods, distributions, and use for medicinal purposes, collection periods, and the plant status including rarity and endangered category. Moreover, a geo-offline online databank on 221rare and very rare vascular plant species was created on the http://mongolspecies.mn/ which included their identification keys, habitats and growing environment, ecology, life forms, distributions, and conservation status as well as their photograpic and distribution illustrations (Gombobaatar et al, 2018).

Plant species unevenly occur in 16 botanic-geographic districts in Mongolia. The records (1982-1996) on plant species in these districts showed Khangai mountainous district was distributed by the most abundant plant species. According to the research findings (2014), Mongol Altay mountain-steppe district was distributed by the most abundant plant species, while Alashaa Gobi district was with the minimum plant species. In the last three decades, the district with the highest numbers of new plant species (704 species) was Mongol Altai, while the district with lowest numbers of new plant species (106 species) was Alashaa Gobi (Report on State of the Environment of Mongolia, 2017-2018).

Under framework of the project activities on wildlife (fauna and flora) trades implemented by ZSL, WWF, and WCS in collaboration with the MET, some publications contained summary reports and facts on illegal trade in some vascular plants were released based on the reports and evidences of trade in fauna and flora species listed in the CITES Appendices (Gombobaatar, Myagmarsuren, 2018; Chimeddorj et.al., 2018; Wingard et al., 2019).

In the scope of the Supplementary Forest Resource Atlas (distribution, stock, evaluation) published in 2011, the distribution-stock of vital forest components such as Siberian pine, nine species of berries, and seven species of mushrooms were identified and evaluated by bio-ecological factors. The publication aims to manage forest resource usage activities as well as set a quote for logging. The publication sets the foundation for this sector's database.

The vascular higher plant collection database at the MAS contains 2,600 pages of herbarium data on 120 species of 80 general of 12 orders (*Apiaceae, Crassulaceae, Ericaceae, Paeoniaceae, Papaveraceae, Ranunculaceae, Fumariaceae, Grossulariaceae, Saxifragaceae, Grossulariaceae, Pyrolaceae, Vacciniaceae*). Also, 63,464 pages-collections of over 2,500 species of about 600 genera of 119 families of five phyla have been converted to digital editions. At the moment, there are about 124,000 collections at the Herbarium of Institute of Botany (Report on State of the Environment of Mongolia, 2015-2016).

Moss

Researchers produced some major publications such as "Moss Flora of Mongolia" and "Flora of Northern Mongolia" in the Russian Federation in 2010. These publications featured plant species of Northern Mongolia and four sub-species belonging to 456 species of 164 genera of 41 families of moss found throughout Mongolia. The mosses were also re-classified in accordance with the new classification being used around the world today. The book also contains distribution maps of 444 species of moss, with identification keys and illustrations.

As of 2018, moss researchers have recorded 570 species (including 10 sub-species) of 210 genera of 74 families of 24 orders belonging to two classes of *Marchantiophyta* and *Anthocerotophyta* mosses in Mongolia. The list of moss species in Mongolia was referenced to the publications including those by Ignatov & Ignatova (2003, 2004), Coffinet & Buck (2004), Ignatov et al. (2006), Tsegmid (2010), and Potyomkin & Sofronova (2009). Taxonomy and species of the mosses were referenced to the publications by Buck & Coffinet (2000), while scientific names of the mosses were referenced to the publications by Ignatov et al. (2006) and Tsegmid (2010). For Mongolian names of the mosses, the publications by Tsegmid (2001, 2010) were used as a reference while scientific and Russian names of some genera and species were directly translated into Mongolian (Enkhjargal, 2019).

Inventory records on species compositions of moss in Mongolia were increased by 36 species in 1990-1995, by 10 species in 1996-2000, by 58 species in 2001-2005, by 11 species in 2006-2010, and by 61 species in 2011-2016.

Rhabdoweisia crispata

Photo credit: E. Enkhjargal, MAS

The moss collection database at the MAS contains approximately 18,700 sample materials and which are widely used for different types of educational, research, and conservation activities.

Under the project "Red List of Plants in Mongolia-II", which was implemented with full finding of ZSL, as requested by the MET, a total of 15 species of moss were assessed by the IUCN Criteria: one species is Critically Endangered, 10 species are Endangered, and four species are Vulnerable (Enkhjargal, 2019).

Among the moss species assessed by the Red List assessment criteria in 2019, there are 11 Critically Endangered, Endangered species and four Vulnerable species. The Government of Mongolia aims to include these Critically Endangered/Endangered species of moss in the List of Very Rare Plants and the Vulnerable species of moss in the List of Rare Plants in Mongolia.

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with the MET request, a database was created with details on distributions of 471 species, growing environment of 267 species, identification keys of 41 species, photographs of 17 species, and distribution map of 31 species of moss. Moreover, a geo-offline online database containing their identification keys, habitats and growing environments, ecological status, life forms, distributions, and conservation status as well as their photograpic and distribution map illustrations was created on the http://mongolspecies.mn/ (Gombobaatar et al, 2018).

Studies on moss have been conducted at Darkhad Valley in Northern Khuvsgul for the past few years. Currently, there are 286 species of 130 genera of 50 families recorded in the study area. Out of these species, 49 species were reported newly in Khuvsgul region and two genera, *Gollania and Bryobrittonia*, and five species, *Encalypta procera, Bryobrittonia longipes, Didymodon leskoides, Racomitrium panschii and Gollania turgens* of moss were reported newly in Mongolia (Tsegmed *et al*., 2007; Ignatov *et al*., 2009).

There are 117 species of 75 genera of 32 families reported in permanent forest study region in Sharyn Gol area. Further classification studies will assist in understanding on the species richness of the region as well as contribute to the moss database of Mongolia.

Algae

According to the research findings on algae, there are over 2,200 species and sub-species of 10 phyla recorded in Mongolia. Majority or over 1,400 species of them are Diatoms, 233 species and sub-species of blue green algae, 26 species of Euglena, 43 species of *Chlorophytes*, 20 species *Miosis*, 236 species of green algae, 225 species of Chara algae, six species of cryptophyte algae and three species of red algae. According to the new classification system by Cavalier Smith (2014), the *Cyanophytes* belongs to true bacterial Kingdom Eubacteria; the Rhodophyte, Chlorophyte, and Charophyte belong to the Kingdom Plantae group; the Euglenophyta belongs to the Protozoa-Euglenozoa group. The report's algae section features these bacterial and botanical groups of algae. As said by the new system, the Bacillariophyta, Cryptophyta, Miozoa, and Ochrophyta phyla are included in the Kingdom Chromista while the rest of algae phyla records are based on those made by Bukhchuluun & Baigal-Amar (2018) (Bukhchuluun, 2019).

Green algae

Photo credit: Ts. Bukhchuluun, the MAS

Records on algae species in Mongolia were increased by 10 species in 1990-1995, by 114 species in 1996- 2000, by 409 species in 2001-2005, by 66 species in 2006-2010, and by 363 species in 2011-2016.

Under the project "Red List of Plants in Mongolia-II", which was implemented in 2018 with full finding of ZSL at a request by the MET, a total of 35 species of algae were assessed by the IUCN Criteria: five species are Critically Endangered, 12 species are Endangered, and 18 species are Vulnerable (Bukhchuluun, 2019).

Among the algae species assessed by the Red List assessment criteria in 2019, there are 17 Critically Endangered/Endangered species. Thus, the Government of Mongolia aims to include the 17 species of algae in the List of Very Rare Plants and 18 Vulnerable species in the List of Rare Plants in Mongolia. Justifications and supplementary details of these species are being prepared for submission for approval.

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with the MET request, a database was created with details on distributions of 2,216 algae species and identification keys and growing environment of 10 algae species along with their photographs and illustrations (Gombobaatar et al., 2018).

Fungus

As of 2016, there were 217 species of 73 genera of 22 families of 3 orders recorded in Mongolia (Kherlenchimeg, 2013). In western Khentii province, there were 14 species of six genera that belonged to family of Lycoperdon (Burenbaatar, 2013) (Report on State of the Environment of Mongolia, 2015-2016).

Mongolia is in a need to update records of families, genera, and species of the fungus occurring throughout the country applying the current scientific research approaches used by and the list of higher fungus approved by the International Mycological Association. At present, there are 631 species of 237 genera of 88 families of 31 orders of fungus recorded in Mongolia. From the list of the fungus recorded in the country, a total of 340 species of 111 genera of 21 families of six orders are newly given with their Mongolian names (Kherlenchimeg, 2019).

Lepista caespitosa

Photo credit: N. Kherlenchimeg, the MAS

There are about 3,000 envelopes-collections at the Institute of General and Experimental Biology. These collections are pertinent to about 535 fungal species. All the collection records and data aforesaid have been compiled into the database on the fungus in Mongolia for a period from 2008 to 2017.

From 1998 to 2012, there were five new species recorded in Khentii Region, 13 species in Khangai Region, 13 species in Mongol Daguur Region, three species in Eastern Mongolia, and one in Great Lakes Depression, Mongol Altay, and Khovd regions respectively.

There are 26 species of *saprophytic* or *coprolitic* fungi (most of *Melanoleuca, Agaricus, Conocybe, Agrocybe,* and *Makrolepiota*) growing in steppe region, 212 species growing in forest regions, where 152 species live with other plants in mycorrhiza association (some species of *Hygrophorus, Russula, Lactarius, Tricholoma, Boletus, Suillus,* and *Gomphidius*), 41 species are *saprophytic* (some species of *Marasmius, Collybia, Mycena, Clitocybe, Leucopaxillus,* and *Lepiota*), and 19 species are lygnophytes (some species of Coprinus and Stropharia). Most of forest mushrooms play a significant role in the forest ecosystem, namely in forest growths having lived with other plants in mycorrhiza association.

The species *Boletinus asiaticus* Sing., *Leccinum aurantiacum* (Bull.) S.F. Gray, *Agaricus tabularis* Pers., *Chlorophyllum agaricoides* (Czern.) Vellinga, *Lepistacae spitosa* (Bres.) Sing., *Leucopaxillus*

giganteus (Sibthorp: Fr.) Sing., *Tricholoma mongolicum* Imai, *Fomitopsis officinalis* (Vill.) Bond. et Sing., *Ganoderma lucidum* (Leyss ex Fr.) Karst., *Inonotus obliquus* (Pers.; Fr.) Pilat, *Calvatia gigantea* (Batsch) and Lloyd, *Lycoperdon molle* Pers., are added to the Mongolian Red Book (2013) and parts of their distribution ranges are taken under state protection.

Records on mushrooms occurring in Mongolia were added by eight species in 1990-1995, by 23 species in 1996- 2000, by 53 species in 2001-2005, by 46 species in 2006-2010, and by 102 species in 2011-2016.

There have been extensive studies on obtaining culture, creating and breeding mycelium from edible and medicinal mushrooms. Studies included identifying basic parameters of Oyster mushrooms (*Pleurotus ostreatus)* polmycel – 107 seeding technology (Gantulga, 2010). Also, the study on the impact of Oyster mushroom (Munkhzaya, 2010), and Chaga mushroom (*Inonotus obliquus*) (Kherlenchimeg, 2010) on tumors showed that these mushrooms suppressed tumor growth. Therefore, further studies must be conducted on possibilities of deriving antineoplastic preparations from Oyster and Chaga mushrooms, and applying those to tumor treatments.

Comprehensive studies were conducted on distributions and resources of mushrooms to identify potential impacts of global warming, increasing dryness, and human activities on population resources of edible and medicinal mushrooms and draw attentions of and have informed decisions made by policymakers for sustainable use and protection of mushroom resources. As a result, we identified biological and harvest resources of seven abundant species of mushroom (Kherlenchimeg et al. 2011).

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with the MET request, a total of 21 species were assessed by the IUCN Criteria: there are two critically endangered, five endangered, and 14 vulnerable species (Kherlenchimeg, 2019).

Among the mushroom species assessed by the Red List assessment criteria in 2019, there are seven Critically Endangered/Endangered and 14 Vulnerable species. Thus, the Government of Mongolia aims to include the Critically Endangered and Endangered species in the List of Very Rare Plants and the Vulnerable species in the List of Rare Plants in Mongolia. For now, their justifications and supplementary details are being prepared and compiled.

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with the MET request, a database was created with details on ecology, life forms, and distributions of 631 species, growing environment of 446 species, identification keys and abstracts of 142 species, photographs of 99 species, and distribution map of 96 species of fungus. Moreover, a geo-offline online database containing their identification keys, habitats and growing environments, population and conservation status as well as their distribution illustrations was created on the http://mongolspecies.mn/ (Gombobaatar et al., 2018).

Lichen

There are approximately 26,000 lichens reported across the globe. In Mongolia, there are 1,067 species belonging to 208 genera of 68 families of 26 orders of 8 classes of three phytes recorded (Enkhtuya, 2019). From the conference of International Botany Congress held in Melburn in 2011, international botanical terminological codexes namely "International Codex for Algae, Fungus, and Plants" (ICN, McNeill et.al. 2012) were called for use in lichen taxonomic names. Accordingly, lichen taxonomic names were updated based on the approaches advised by Santesson *et al.* (2004), Hawsworth *et al.* (2008) and Esslenger (2009) and some changes were made in accordance with the suggestions by Urbanavichus (2010) and Roux (2012) on the CABI Bioscience Database (http://www.speciesfungorum.org) (Enkhtuya, 2019).

In comparison to the report from 2010, there were over 20 lichen species newly recorded. These new species include: *Artthonia mediella*, *Basidia circumspect*, *Blastenia furfuracea*, *Calicium viride*, *Caloplaca chlorine*, *Cyphelium karelicum*, *Lecanora allophana*, *L.boligera*, *L.cadubriae*, *L.subintricata*, *Lepraria ecorticata*, *L.rigidula*, *Leptogium subtile*, *Ochrolechias zatalaлnsis*, *O.turneri*, *Placynthiella dasaea*, *Rinodina freyi*, *R.septentrionalis,* and *R.trevisanii*.
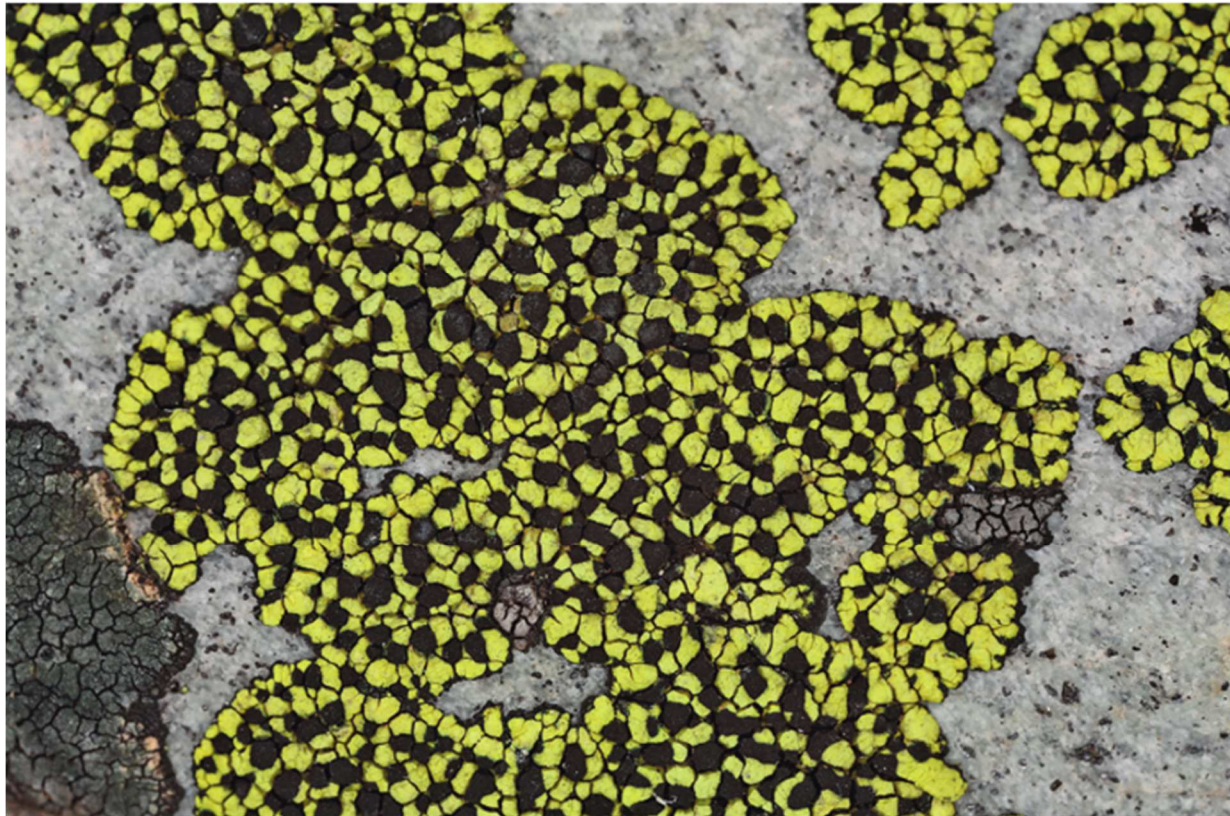
Rhizocarpon riparium

Photo credit: S. Javkhlan, the MAS

The lichens growing in Mongolia are unique in that they contain characteristics of lichen families growing in Holarctic, Mediterranean Sea, and East Asia. Amongst, the lichen families with strong characteristics of Holarctic lichen such as Physciaceae, Cladoniaceae, Peltigeraceae, and Parmeliaceae are abundant in the northern part of Mongolia. Lichen families which have characteristics of ancient Mediterranean species are Lecanoraceae, Acarosporaceae, Collemataceae, Verrucariaceae, and Teloschictaceae which grow in the western part of Mongolia. Records of lichen composition in Mongolia were added by 13 species in 1990-1995, by one species in 1996- 2000, by 13 species in 2001-2005, by 43 species in 2006-2010, and by 11 species in 2011-2016. Currently, there are 58 interdemic species and four native species of lichens recorded in Mongolia. In 2013, *Aspicilia hedinii* (H. Magn.) Oksner, *Cladonia mongolica* Ach., *Peltula zabolotnoji* (Elenkin) N.S. Golubk were recorded as new endemic species, while *Aspicilia changaica* (Klem.) N.S. Golubk., *Lobaria retigera* (Bory.) Trevis, *Rhizoplaca baranowii* (Poelt) Goluk., *Squamarina pamirica* N.S. Golubk., *Aspicilia esculenta* (Pall.) Flagey., *Cetraria alverensis* (Wahlenb.) Vain., *Nephromopsis komarovii* (Elenkin.) J. C.Wei, *Cetraria potaninii* Oksner., *Cetraria steppae* (Savicz) Cogt, *Cladonia kanewskii* Oksner, *Caloplaca lenae* Sochting et Figueras, and *Tonina gobica* Golubk were listed in the Red Book of Mongolia (2013) and parts of their distribution ranges were taken under state protection.

There are approximately 15,000 collections kept in the lichen collection at the MAS in accordance with the storage standard and which are used for educational and research purposes.

Under the project "Red List of Plants in Mongolia-II" implemented with full finding of ZSL, as requested by the MET, a total of 32 species of lichens were assessed by the IUCN Categories and Criteria: there were four species Critically Endangered, 14 Endangered, and 14 Vulnerable species (Enkhtuya, Javkhlan, 2019).

Among the lichen species assessed by the Red List assessment criteria in 2019, there are 18 Critically Endangered/Endangered and 14 Vulnerable species. Thus, the Government of Mongolia aims to include the Critically Endangered/Endangered species in the List of Very Rare Plants and the Vulnerable species in the List of Rare Plants in Mongolia. At present, their justifications and supplementary details are being prepared and compiled for their inclusions in the Lists.

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with the MET request, a database was created with details on distributions of 1,061 species, growing environment of 370 species, identification keys of 17 species, and photographs of 202 species of lichens. Moreover, a geo-offline online database containing their identification keys, habitats and growing environments, ecological status, life forms, distributions, and conservation status as well as their photograpic and distribution map illustrations was created on the http://mongolspecies.mn/ (Gombobaatar et al, 2018).

Conservation and Sustainable Use of Plants

Supported the conservation, sustainable use, and restoration of plant stocks in the country at the policy level, the MET has undertaken the following activities:

A revised Law on Natural Plants was proposed and prepared for submission to the Government (Report on State of the Environment of Mongolia, 2017-2018).

Under protection of natural plants through banning of commercial harvests of natural plants in systematic way and cultivating some of natural plants, commercial harvest and collection of wild *Divercata Sapochnicova*, included in the List of Rare Plants has been banned by the Environment and Tourism Minister's Order No. A/43 dated March 01, 2018 for five years until January 01, 2023. A list of the natural plants with high or increasing demands, but low or reducing stocks those need planting was prepared and published along with handbook and recommendations. Moreover, model seed plots for some natural plants such as *Saposhnikovia divaricata* (Turcz.), Mongolian milkvetch (*Astragalus mongolicus* Bge.), *Rhodiola quadrifida* (Pall.) and Greater celandine (*Chelidonium majus* L.), which are harvested and used, were established in a territory of Kherlenbayan Ulaan *bag* (the smallest administration unit) of Khentii aimag (province) in 2018. Furthermore, standards for collecting, drying, packaging, transporting, and storing of the 10 species, Redhaw hawthorn (*Crataegus sanguinea* Pall.), valerian (*Valeriana officinalis* L.), Great burnet (*Sanguisorba* officinalis L.), Thermopsis (*Thermopsis lanceolata* R. Br.), *Rheum undulatum* L*., Saposhnikovia divaricata* Turcz. Schischk., *Ephedra sinica* Stapf., *Gentiana decumbens* L., which are highly affected by harvest and use, were drafted and adopted (Report on State of the Environment of Mongolia, 2017-2018).

Under the framework of strategic objectives of the National Biodiversity Programme enacted by the Government Resolution No. 325 in 2015, scientific introduction studies on *ex situ* protection and breeding/diversifying of natural plant genetic pool in Mongolia were carried out in the Garden of Botany and consequently live collections of **305** woody, shrubbery, and herbs belonging to **141** genera of **59** families have been produced. Under the studies, a total of 70 very rare and rare domestic plant species and over 10 foreign plant sorts have been cultivated in *ex situ* and all the records of these collections provide for important research materials in the database (Report on State of the Environment of Mongolia, 2017-2018).

The Action Plan of the Government of Mongolia for 2016-2020 states an objective to support re-introduction and cultivation of the plants, which are threatened with extinction and highly useful economic importance, with funding and tax policies. Under this objective, the efforts to cultivate some useful natural plants for industrial/commercial purpose have been succeeding under the policy to encourage and mobilize private companies and economic entities into the efforts (Report on State of the Environment of Mongolia, 2017-2018).

"Mongolia Sustainable Development Vision 2030", objective 1 is "*to preserve the natural landscape and biodiversity, and ensure sustainability of the ecosystem services*"; and 4.2.9.3 of the Action Plan for Programme of the Government of Mongolia for 2016-2020 says "*to take protection and restoration measures for habitats and distribution ranges of very rare and rare fauna and flora species*". Based on these objectives, the Government of Mongolia aims to phase down collection and harvest of natural plants for industrial purpose.

In the total export of plants and their derivatives from Mongolia in 2017-2018, the cedar nut export accounted for 98 percent (Table 3).

Table 3. Sizes of plants and their derivatives exported for commercial/industrial purposes in 2017 and 2018, (ton)

No	Mongolian names	2017	2018
1	*Lycium ruthenicum Murr.*	2.52	
2	*Leucocalocybe mongolica*	0.5	0.6
3	*Pyrola* sp.	0.55	
4	*Iris tenuifolia*	2	
5	Siberian pine nut	13,286.2	2,782.4

Micro-Organism

No comprehensive data and records on micro-organisms ant their families, genera, and species are available for now. Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with the MoET request, a list of 243 micro-organism genera was produced and the data and information on 30 genera biologically active compounds, nutritive medium, micro-organism cultivation, and sample sources were produced and entered the environmental database (Enkh-Amgalan, 2019; Gombobaatar et al., 2018).

UNDP and MoET started three-year project "Stregnthening of Human Resources, Legal Frameworks, and Institutional Capacities to Implement the Nagoya Protocol" in September, 2017. Component 2 of the project is "*to build trust between users and providers of genetic resources to facilitate the opportunities for bio-discovery efforts to identify, collect and process genetic resources*".   Under the component, a focus is given to enhanced researches and capacities of all stakeholders (e.g. national and state competent authorities, related agencies, academic and research institutions and others including private sector and local communities) and their better understanding on legislation on genetic resources and traditional knowledge to ensure increased genetic resources and traditional knowledge. Follow-up and achievements of the objective will be a basis for registration and documentation of all breeds of livestock, sorts or kinds of natural and cultivated plants and their wild

families, genera, and species, assessment of their status, and prevention from their depletion throughout the territory of Mongolia.

The project document states that the Law will regulate studies, registration, preservation, protection, use, creation of integrated registration and database, and ownership of valued genetic resources of animal, plant, in particular micro-organism origins and traditional knowledge related to them within the territory of Mongolia.

Currently, there are 53 types of micro-organisms recorded in the database on micro-organisms created under the project. Sources of the micro-organisms recorded as genetic resources include soils, plant roots, traditionally prepared dairy products, different types of yeasts (e.g. bread yeast), wild berries grown, disease causing insects, rodents, stomachs and intestines of baby and young animals, oil, etc. within the territory of Mongolia.

Fauna

Insects

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented with funding from the Fund for Sciences and Technology in accordance with the MoET request, there was a List of 5,898 species including Trematoda -15, Cestoda -94, Rotifera -92, Acanthocephala- 9, Mollusca-34, Nemathelminthes -115, Arthropoda: Arachnida - 551, Hexanauplia - 32, Branchiopoda -50, Ephemeroptera-103, Odonata-59, Orthoptera-159, Plecoptera –54, Coleoptera-3,166, Anoplura–9, Hymenoptera -143, Hymenoptera: Formicidae- 71, Trichoptera –198, Siphonaptera-166, Lepidoptera 578, Diptera: Culicidae -34, Diptera: Tipulidae -166 species (Gombobaatar et al,, 2019). The list of species is included in the database with a caption of each species separately.

Because of a wide range of distributions, research at ecosystem level has been used to create a foundation database for insect genera and species those are dependent on types of habitats. However, researchers covered few invertebrate species' groups by some studies so that no detailed biological and ecological studies have been conducted yet.

Based on a nationwide study conducted at regions such as northern forest areas of Khentii mountain range, coniferous forests along the western bank of Khuvsgul Lake, and boreal forests of Mongol Altai and Khangai mountain ranges since 2008, there were approximately 300 species of 20 families of butterflies (Muehlenberg *et al*., 2011; Enkhbayar, 2013). A detailed study on forest insects conducted at the north of Khentii mountain range, which helped determine the distribution of *Carabus canaliculatus* Ad., *Carabus arcensis* Herb., *Pterostichus interruptus* Dej., *Pterostichus dauricus* Geb., *Pterostichus (Euryperis) eximius* Mor., *Cicindela gracilis* Pal., *Carabus (Carabus) billbergi* Man., *Carabus (Morphocarabus) hummeli* F-W., from Carabidae, Coleoptera and *Xylotrechus rusticus* Lin., *Monochamus urussovi* F-W., *Saperda scalaris* Lin., *Xylotrechus Siberian Ibex* Geb., and *Xylotrechus hircus* Geb., from Cerambycidae, Coleoptera (Gantigmaa et.al., 2012; Buyanjargal, 2010). During the research of insects in different habitats of Khentii mountain range, a total of 362 species of 265 genera of 109 families of 13 orders were recorded near Onon River valley. Out of the 362 species, 13 species were newly recorded in the region (Puntsagdulam, 2011). Among the insects recorded in Onon River Basin, there are the species e.g. *Aeshna juncea mongolica*, *Parnassius Apollo*, *Papilio machaon*, and *Hemaris tityus* listed in the Red Book of Mongolia and *Bombus sporadicus* occurring. There are 151 species of 97 genera of 34 families of seven orders, which feed on parts of bushy, shrubbery, and woody plants (Puntsagdulam, 2011). These include: Siberian silk moth (*Dendrolimus sibiricus* L.) in the forests of Tsenkhermandal, Umnudelger, Binder and Dadal *soums* of Khentii *aimag* (Badamjargal, 2010); Khurel Bulag passage and Suudriin Khavtgai of Orkhon *soum*, Tsagaan Passage of Khutag-Undur *soum*, Saikhan Modny Am of Saikhan *soum*, and Agtiin mountain range in Bayan-Agt *soum* of Bulgan province; Gypsy moth (*Lemantria dispar*) in forests of Chandmani-Undur, Tsagaan-Uur, and Erdenebulag *soums* and deciduous forest in Eg-Uur river valley; Jacobson's spanworm butterfly (*Erannis jacobsoni* Djak.) in Umnudelger soum of Khentii province. Based

on the report that these species' populations are increasing, the Government took actions to fight against these species in over 22,980 hectares. Another action was taken against the *Orgyia antiqua* Lin. population in boreal forests of upper Tsagaan Maanit River in Erdenetsogt *soum* of Bayankhongor *aimag* and was able to detain the population growth (Report on State of the Environment of Mongolia, 2015-2016).

Dragonfly

Photo credit: S. Gombobaatar, Mongolica Publishing

During a study of Gobi insects and invertebrates, the species such as *Bryodema gebleri* F-W., *Bryodema mongolicum* Zub., *Calliptamus barbarus* Costa., *Compsorhipis bryodemoides* Bei-Bienko., *Compsorhipis davidiana* Saus., *Gryllus desertus* Pall., *Leptopternis gracilis* Evers., *Mongolotmethis kozlovi* Bey-Bienko., *Zichya baranovi* Bei-Bienko., and *Zichya sp*. species were reported abundant. Of these species, the *Compsorhipis bryodemoides* Bei-Bienko., *Mongolotmethis kozlovi* Bey-Bienko., and *Zichya baranovi* Bei-Bienko are endemic to Mongolia. The study also recorded occurrence of *Dericorys annulata roseipennis* Redtenbacher, which had not been observed in recent years. Some interesting data was collected about Trichoptera at water points in the Gobi region. Based on studies at over 40 springs and water holes, the distribution of *Apatania mongolica* Martynov and *Limnephilus primoryensis* Nimmo were very limited to adjacent natural springs. Besides limited distribution area, *Apatania mongolica* Martynov and *Limnephilus primoryensis* Nimmo was recognized fairly recently in 1995. Therefore, further studies on biology and ecology and their conservation plans are needed to be done for these species.

Studies aimed at arachnids (Arachnida), crustaceans (Branchiopoda), annelid worms (Clitellata), rotifers (Eurotatoria), gastropods (Gastropoda) and leeches (Hirudinea) in Mongolia resulted in the cataloguing 30 species of 9 classes. These studies were conducted at Umnugobi province's Khanbogd Mountain in Khanbogd soum, Galbiin Gobi, Undain river bed and Nariin Sukhait valley and Nemetgei

mountain range in Gurvantes soum (Gantigmaa et al, 2012; Report on State of the Environment of Mongolia, 2015-2016).

Arachnid

Photo credit: S. Gombobaatar, Mongolica Publishing

During research studies at Khanbogd soum of Umnugobi province, researchers found 7 out of 20 springs had dried. Species such as *Paracorixa spp., Callicorixa sp.* and *Sigara sp.*, *Sigara lateralis* (Corixidae, Hemiptera), *Gerris sahlbergi* (Gerridae, Hemiptera) species, *Ishnura elegans* (Coenagrionidae, Odonata) species (*Helophorus sp.*, Helophoridae), and *Hygrotus (Coelambus) flaviventris* species had been recorded in the springs previously. As for the crustaceans, the *Branchinecta ferox* M. Milne-Edwards, *Branchinecta minuta* Smirnov, *Branchinecta orientalis* Sars, *Ceriodaphnia pulchella* Sars, *Daphnia carinata* King and *Moina brachiata* Jur., had been identified previously (Gantigmaa e .al., 2012; Report on State of the Environment of Mongolia, 2015-2016).

Distributions of forest pest insects in Mongolia, there are over 700 species of pest insects recorded and out of them, 300 species belonging to 168 genera of 56 families of seven orders are considered forest pest insects. Studies on distributions of damageable forest insects were conducted within 901.1 thousand hectares in 2015-2016 and 4617.4 thousand hectares were defined as a core distribution area of these pests. Due to a lack of financing in recent years, all the core and distribution areas in need of controlling and combating are not entirely covered. To prevent, combat, and control infestations of forest pests and diseases, it is necessary to apply advanced technology and techniques and rely on environmentally friendly biological approaches while phasing out pesticides (Report on State of the Environment of Mongolia, 2015-2016).

INSECT USE: Due to cultural aspects of the Mongolians, there is very little direct use of insects. However, ecological services (honey, medicinal plants, other products derived from animals) provided by insects and invertebrates are used widely. For example, the darkling beetle (Blaps sp., Tenebrionidae) secretes a bio lipid for self-protection. This secretion is used for traditional medicines and treatments (Gunbilig et al., 2009; Aldarmaa et al., 2010). Also, for respiratory illnesses, medicines based Bryodema, Angaracris, and Caliptamus species of grasshoppers are used for cures. However there have been no detailed studies on the population trend or ecology of these species. Therefore, it is difficult to identify threats as well as its value to the well-being of humans. Hence, we must register insect species that are valuable to the ecosystem as well as humans, and conduct a thorough study on those species. Therefore, we need to carry out inventories and detailed studies on these species with a focus on their roles playing in the ecosystem conservation and human well-being.

INSECT CONSERVATION: In 2012, a study on the distribution on rare and threatened insect and invertebrate species was conducted within the framework of the Ministry of Environment and Green Development's action plans. The database of species richness as "Rare" in the Mongolian Red List as well as other rare and threatened species was updated (The Red Book of Mongolia, 2013). Although, there aren't enough data on insect biodiversity and population trends, studies on insects and invertebrates of certain ecosystems within the last 4 years have provided fundamental data for the biodiversity of these species.

Studies and monitoring are needed for the species that had been recorded in the country, but their occurrences and population status rarely re-recorded lately. The species such as Similis grasshopper (*Eclipophleps similis* Mishch*.*), Pale grasshopper (*Eclipophleps lucida* Mishch), *Bryodema nigripennis* Mishch, Rattle grasshopper (*Psophus stridulus* L.), one species of Gobi grasshopper (*Beybienkia lithophila* Gorochov & Mishchenko), and Mistshenkoi's green grasshopper (*Mongolotettix mistshenkoi* Chog.) have not been recorded in the last 30 years.

Fish

POPULATION STATUS OF FISH IN MONGOLIA: There is a list of 78 fish species and sub-species belonging to 47 genera of 15 families of eight order and one sub-order produced in Mongolia. The list of fish species was produced and updated through a desk review of the publications by a number of national and international researchers including Berg (1911, 1912), Dashdorj et al. (1964, 1970), Nelson (1976), Rass et al. (1983), Sokolov et al. (1983), Baasanjav et al. (2001), Bogutskaya et al. (2004), Mendsaikhan et al. (2017), and Prokofiev (2002, 2003, 2006, 2007). Taxonomic sequence, species classification, and scientific and English names of the fish were referenced to the publications by William Eschmeyer & Ronald Fricke (1980), http://Eschmeyer's Catalog of Fishe, Froese & Pauly (2003), and Kottelat (2006) and the list of fish species in the Fresh Water Fish Atlas in Russia produced by Reshetnikov et al. (eds) (2003). Researchers from America and Europe included names of some genera and species of Eurasian fish in the global taxonomic lists of fish. Lately, significant changes have been made to names of the Eurasian fish species in the global list thanks to efforts of Russian scientists and M. Kottelat a Swiss scientist-ichtilogist. Mongolian names of the fish species recorded in the country were referenced to the publications by Dashdorj et al. (1964, 1970), Baasanjav et al. (2001), Mendsaikhan et al. (2017) and some changes made to the names at a decision by the sub-committee of fish at the Taxonomic biodiversity experts in Mongolia (Mendsaikhan, 2019).

Siberian dace (*Leuciscus baicalensis* Dybowski)

Photo credit: S. Gombobaatar, Mongolica Publishing

There are 12 species of fish recorded in the Central Asian Internal Drainage basin, 32 species in Arctic Ocean basin, and 44 species in Pacific Ocean basin. The Cyprinidae accounts for 56 percent in the fish species composition recorded in Mongolia.

RARITY STATUS OF MONGOLIAN FISH: Based on the evaluations, one species is listed as Critically Endangered (Siberian Sturgeon), six species listed as Endangered (Gobi loach, Dzundarian dace, Pidschian, Amur grayling, Khuvsgul grayling and Taimen), four species listed as Vulnerable (Potanin's osman, Small osman, Mongolian grayling and Lenok), and three species listed as Least Concern (Amur gitterling, Ide, and Arctic grayling). There are 22 species listed as Data Deficient and 12 species listed as Least Concern. The species such as Eastern brook lamprey, Siberian sturgeon, Amur sturgeon, Taimen, Arctic cisco, tench, and Haitej sculpin listed in the Red Book of Mongolia (Ocock *et al*., 2006).

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented with funding from the Fund for Sciences and Technology in accordance with the MoET request, a geo-offline online database containing identification keys, habitats and ecological status, life forms, distributions, conservation, rarity status, photographs and distribution range illustrations of 79 fish species was created on the http://mongolspecies.mn/ (Gombobaatar et al., 2018).

IMPACTS AND USE: Based on the evaluations, almost 80% of fishes in Mongolia are endangered in some way or have insufficient data.

Studying the distribution, biology, ecology, population dynamics, stock and hunting status of fishes and setting up a monitoring system will ensure the conservation of the biodiversity of this group.

In last 60 years, occurrence and distribution of alien fish species has been expanded in the country due to climate change and unpermitted introduction of fish in Selenge River Basin for household purpose. Due to habitat degradation, populations of Lenok *(Brachymystax lenok)* and Artic grayling *(Thymallus arcticus)*, the indicator species of fresh and cold water environment, are decreased while populations of the species such as Prussian carp *(Carrasius gibelio)*, Common roach *(Rutilus rutilus), and* Dace *(Leuciscus leuciscus)* are increased. Fish stocks in the country have reduced by 4-16 times due to the factors such as reduced water tables in lakes and rivers, reduced forest resource in water catchment areas, wildfire, illegal hunting, habitat degradation, etc. (Report on State of the Environment of Mongolia, 2015-2016).

Due to increasing fishing in Buir Lake, changes have been made to game fish species populations as follows: the percentage of Amur pike (*Esox reichertii*), a raptor species, is reduced and the Taimen *(Hucho taimen)* and lenok (*Brachymystax lenok*), key representatives of sports fishing, are rarely seen, while the Asian common carp (*Cyprinus rubrofuscus*)*,* Prussian carp (*Carassius gibelio*), and Amur ide (*Leuciscus waleckii*) feeding on mixed and benthic species, are becoming dominant in the lake.

Comprehensive conservation, monitoring, restoration, and breeding actions are required for entire or some very rare fish populations in Selenge and Orkhon Rivers. In the 1980s, the white fish accounted for 70 percent of fishing in Upper Tsagaan Lake in Darkhad Depression. The species has become very rare in the lake in recent years, while the Dace, Arctic grayling, and Taimen have been fished mostly (33-52% in fishing).

As fishing is increased, the useful game fish stocks including large and piscivorous species' populations have become reduced, while the fish species feeding on mixed and benthic species have become dominant. As a result, compositions and commodity qualities of game fish species have changed as body sizes of major game fish species become dwarf and smaller according to the recent researches.

During the previous 13-14 years, the water level of lakes and rivers in the Gobi and steppe regions has lowered to its minimum level. The report submitted by the National Meteorology and Environment Monitoring Agency (2010), the annual average water level of Khar-Us lake had decreased by 32 cm since 2001, Terkhiin Tsagaan lake by 42 cm since 2000, Ugii lake by 114 cm since 2004, Buir lake by 183 cm since 1999, Khyargas lake by 281 cm since 1998, and Buuntsagaan Lake water level decreased by 603 cm since 1998. Steady decreases in the water level of such reservoirs impact the balance of the ecosystem, threatening the fish and other species dwelling in the area. In last 13-14 years, water tables of lakes and rivers in Gobi and steppe regions have unprecedentedly lowered to their minimum levels.

Based on the research, Ugii Lake had the highest numbers of benthic species (35 species). This shows that the lake is being polluted by human activities, and the fish stock is decreasing. Kharmai and Dood lakes of Darkhad Depression have a quota of 5-10 tons of fish per year. At Targan Lake, the breeding period of some species lasts at the beginning of November until end of December. There are instances of hunting some of fish species during the breeding season at Naiman Lake, Ulaagchnii Khar and Darkhad Tsagaan lakes, thus negatively impacting the fish stock. A disperse analysis and comparison was applied to the biometric evaluations on 1,258 whitefish at Naiman nuur of Uvurkhangai aimag, which showed that the ecological status of the fish was safe, and the body size of an adult fish was steadily growing. Therefore, we need a new legislative document to prevent hunting and fishing during breeding seasons.

There have been instances of illegal fishing over the years. These human activities are having negative impacts on the fish community, resulting in endangerment and extinction. In the past 20 years, fishing operations have been present at Great Lakes Depression, Khar Us, Khar, and Durgun lakes (Terbish, 2014).

At Ugii Lake of the Arctic Ocean Basin, commercial fishing has been popular for quite some time. From 1960 to 1983, up to 900 fish were meanly caught per season. However, from 1983 to 1993, commercial fishing declined to only 32 tons caught per year. Lack of integrated database on the fishing in the past 15 years makes it difficult to conduct an accurate assessment of this situation. During this period

the water level of Ugii Lake reduced noticeably due to climate change. This will continue to have an adverse impact on the breeding season of species living in the lake.

Due to a growth in mining operations near large river beds, such as Orkhon and Selenge, pollution has become a large problem degrading the habitat of fish. The breeding migration route of the Omul has been shortened because of pollution caused by mining operations. As a result, spawn deaths have increased. Following a study in the area, experts estimated that the breeding migration of Omul only continues for 5 kilometers from Sukhbaatar city. Experts concluded that Orkhon River is no longer valuable to the breeding migration of Omul fish (Dgebaudze et al., 2009).

Due to mining and industrial operations, Tuul River near Zaamar has been polluted. This has resulted in the disruption of breeding rhyofite fishes such as Taimen and Siberian grailing the river. During a monitoring study at Zaamar, not a single fish from the species mentioned above were caught.

Fishing is not a large aspect of Mongolian tradition therefore it was not a common practice. However, it has become more popular in recent years among amateurs. Fishing near towns and cities has decreased the stock of Taimen, Lenok, Grayling and Whitefish. There is a lack of monitoring the implementation of law on illegal fishing therefore it is difficult to evaluate the damages accurately.

The tourism sector has been developing rapidly in Mongolia. One of the main tourist packages is sport-fishing. Today, tourists from all over the globe are coming to fish in Mongolia, and the number of tour operators offering such packages has increased (Terbish, 2014).

FISH CONSERVATION AND TREND: The Mongolian Law on Animals listed Amur Sturgeon (Acipenser schrenckii) and Tench (Tinca tinca) as very rare, Eastern Brook Lamprey (Lethenteron reissneri) and Taimen (Hucho taimen) as rare (in accordance with government decree number 7, appendix 1 passed in 2012).

The "Mongolian Pisciculture Center" was established under the decree of the government to conserve the fish stock and increase population. The center has established a pisciculture laboratory at Dood Tsagaan Lake of Khuvsgul province's Tumurbulag and Tsagaannuur soums.

Mongolia is set to prohibit fishing Omul from August 30th to October 30th, white coregonid from September 15th to January 30th through applicable laws. This will ensure the sustainable growth of the species populations.

A new cycle has been set up at Ulaagchnii Khar Lake, which did not have any previous stocks, and a new swarm of fish species was established. This set the foundation for a new stock of food source.

Amphibian

POPULATION STATUS OF AMPHIBIAN IN MONGOLIA: Currently, there are six species belonging to five genera of four families of two orders of amphibians recorded in Mongolia (Table 4) (Terbish, 2019). The species compositions of the amphibians were referenced to a key publication on amphibians and reptiles in Mongolia (Munkhbayar, 1976; Ananyeva et.al., 1997; Terbish et al., 2013; Kuzmin et al., 2017). Scientific and English names of the amphibians and reptiles recorded in the country were identified in accordance with the guidance from the International Herpetological Committee. Mongolian names of most of amphibians are the same as those in the publications by Kh. Munkhbayar (1976), Kh. Munkhbayar et.al (2010), and Kh.Terbish *et al.* (2013). However, Mongolian names of the species scientifically discovered (Orlova *et al*., 2017) and the species newly recorded in recent years (Kropachev *et al*., 2016) are defined and approved at decisions of Sub-Committee for Taxonomy and Rarity of Amphibians and Reptiles in Mongolia.

Table 4. Species composition of amphibians in Mongolia

Order	Family	Species
Caudata	Hynobiidae	Siberian salamander (*Salamandrella keyserlingii*)
Anura	Bufonidae	Mongolian soad (*Bufo raddei*) Pewzow's soad (*Bufo pewzovi*)
	Hylidae	Far-Eastern tree frog (*Hyla japonica*)
	Ranidae	Siberian wood frog (*Rana amurensis*) Asiatic grass frog (*Rana chensinensis*)

Siberian salamander (*Salamandrella keyserlingii* Dybowski)

Photo credit: S. Gombobaatar, Mongolica Publishing

The relatively few number of amphibian species in Mongolia is due in part to the geographical location and continental climate of this country. These few species of amphibians are distributed throughout the Mongolian landscape. For example, in Khangai-Khentii mountainous region and Eastern Mongolian Plain, where surface water is plenty, amphibians are widely distributed. However, in the arid Gobi regions or the cool Altai mountain region, there are very few amphibian species.

RARITY STATUS OF AMPHIBIANS IN MONGOLIA: When the amphibians' status was evaluated using the IUCN criteria, these four species: Siberian salamander, Pewzow's toad, Far-Eastern tree frog, and Asiatic grass frog were classified as Vulnerable (Terbish et al., 2006). All these amphibian populations are at the edge of their distribution areas (Terbish, 2014). These findings show critical future trends of the species.

THREATS AND NEGATIVE IMPACTS ON AMPHIBIANS: Climate change, global warming and human activities such as urbanization are considered main reasons for desiccation of many rivers, lakes and springs. This is affecting the population and distribution of amphibians in Mongolia. The population of Siberian

salamander in the Tuul River basin near Ulaanbaatar has declined, and the Mongolian toad has not been recorded in recent years. At Buurug in the Ukhert river basin in Darkhad Depression, there are over 30 small glacial lakes. However, more than half of them have dried out, causing a disruption in the population of Siberian Salamander. The drying of large Gobi lakes such as Taatsiin Tsagaan, Ulaan and Adgiin Tsagaan has caused declines in the population and distribution of the Mongolian toad. In recent years, due to disruption in the flow of Tuin River, Orog Lake's water level has declined, which is likely to affect the population of Mongolian toad. The same negative situation was noted at Orkhon-Selenge basin, where almost 66.6 percent of the amphibians (Siberian salamander, Siberian sand or Radde's toad, Japanese tree toad, and Siberian wood frog) in Mongolia inhabit (Terbish, 2014).

Researchers of a Mongolian-Russian joint biological expedition studied two water reservoirs near Shaamar, where many amphibians are found during 1983-1984. The population of the 4 species at these water reservoirs was 880 per 1,000 m2 area for 1+ year, and the juvenile population was 10,800 (Borkin et al., 1988). However, 24 years later, in 2008, a repeat study at the site showed that the first group of lakes had dried, therefore no signs of amphibians inhabiting the area were found. There were amphibians inhabiting the second group of lakes. However, the population and distribution was limited (Cuzman, 2009). The research showed that the rare species such as Siberian salamander and the Far-Eastern tree frog were no longer found in these lakes. The reason for amphibian population decline and distribution area decrease at Orkhon-Selenge basin is mainly anthropogenic. The vegetation of the surrounding areas has been stripped, and majority of the land has been cultivated for fruit and vegetable crops. Also, the water in the surrounding reservoirs is being used for crop irrigation, thus amphibian habitats have shrunk affecting their population (Terbish, 2014).

An albino species was found amongst the Siberian wood frog population at Shatan river which pours into Kharaa lake at Batsumber soum of Tuv aimag (Munkhbaatar, 2008). Also, there were many oligodactyl tadpoles among the Mongolian toad population in Kherlen and Onon river basins (Borkin et al, 2011). Studies recorded several species with missing hind legs within a population of Mongolian toad tadpoles undergoing metamorphosis. For example, almost 40 percent of the population's juvenile species had a deformity. The pH level of the marshes these species inhabit is 8.3. However, there weren't any deformed species within the adjacent populations. The same situation was observed at Mankhaadai Lake in Dadal soum of Khentii aimag (Munkhbaatar and Terbish, 2008). Researchers estimated that 35 percent of species were deformed and they believe it is due to pollutants in the water.

CONSERVATION AND TRENDS OF AMPHIBIANS: Four species of amphibians (*Salamandrella keyserlingii, Bufo pewzovi, Hyla japonica,* and *Rana chensinensis*) were listed in the Mongolian Red List and the Mongolian Rare Species List (Government Resolution No. 7, Appendix 1).

Therefore, it is important to study the distribution trends, population fluctuations, and threats to these species and establish a management system to ensure their conservation. In this line, we do support a former proposal on taking the vicinity of Buureg Hill (where Siberian salamander, Japanese tree toad, Siberian wood frog, and Siberian sand or Radde's toad co-exist) in Shaamar soum of Selenge province under protection with a category Nature Reserve (Terbish, 2014).

Reptile

SPECIES COMPOSITION AND STATUS OF REPTILES: There are 23 species belonging to 15 genera of seven families of two sub-orders of one order of reptiles recorded in Mongolia. The species compositions are referenced to the key research publication on reptiles in Mongolia (Munkhbayar, 1976; Ananyeva et.al., 1997; Terbish et al., 2013; Kuzmin et al., 2017). Scientific and English names of the reptiles recorded in the country were identified in accordance with the guidance from the International

Herpetological Committee. Mongolian names of most of reptiles are the same as those in the publications by Kh. Munkhbayar (1976), Kh. Munkhbayar et.al (2010), and Kh.Terbish *et al.* (2013) (Terbish, 2019).

Mongolian agama (*Laudakia stoliczkana* Blanford)

Photo credit: S. Gombobaatar, Mongolica Publishing

True lizards (Lacertidae) and snakes (Colubridae) make up over 50 percent of reptile species in Mongolia. Reptiles in Mongolia are mainly distributed in the Gobi region, with warmer and arid climate.

Based on a detailed survey on the classification of Mongolian Agama (Laudakia) by K.J. Bair (2012), a new species called Paralaudakia was discovered, and the group distributed within the Mongolian territory is classified as Agama. Therefore, Agamas which had been *Laudakia stoliczkana* is referred to as *Paralaudakia stoliczkana* in this report. The Orsini's viper (*Vipera ursini*) was first recorded by V.V.Sopojnikov, a Russian naturalist, in the western part of Mongol Altai Range in 1906 (Kashenko, 1909). Apart from this, there is no any other substantial research data existing for now.

A taxonomic study resulted in the addition of the following sub-species: *Eremias przewalskii tuvensis* Szczerbak, 1970 (Szczerbak, 1970), *Eremias multiocellata bannikowi* Szczerbak, 1973 (Szczerbak, 1973), *Eremias multiocellata tsaganbogdensis* Munkhbayar et Borkin, 2010 (Munkhbayar and Borkin, 2010), *Paralaudakia stoliczkana altaica*, Munkhbayar, 1971 (Munkhbayar, 1971). But the study on sub-species of reptiles is not yet complete. Especially Tuva toad-headed agama, Multi-ocellated racerunner, Gobi racerunner, Halys pit viper needs detailed study on classification (Terbish, 2014).

In recent years, taxonomy of one species of lizard was studied (Orlova et al., 2017) and one species was newly recorded (Kropachev et al., 2016) in Mongolia.

THREATS AND NEGATIVE IMPACTS ON REPTILES: There are almost no instances of using reptiles for food, medicine, commercial or trade purposes in Mongolia. Therefore, there is very little direct anthropogenic threat to reptiles. However, there is threat to the habitat, distribution and population of reptiles caused by human activities. Pasture land degradation due to overgrazing, desertification, wildfires, pesticides and

rodenticides, exploration for natural resources, land erosion and degradation are main threats. Although, there is very little information on how these threats are affecting reptiles (Terbish, 2014).

REPTILE CONSERVATION AND TRENDS: There are six species of reptiles (*Cyrtopodion elongatus, Phrynocephalus helioscopus, Eremias arguta, Eryx tataricus, Coluber spinalis,* and *Vipera berus*) listed in the Mongolian Rare Species List (Government Resolution No. 7, Appendix 1, 2012) as well as the Mongolian Red Book. These species make up 27.2% of the total reptiles in Mongolia.

A detailed study on the distribution, biology, ecology and population dynamics of reptiles in Mongolia and implementation of a monitoring system is vital to the conservation of reptile species in this country. Also, suitable habitats such Nogoon Tsav in inner Altai Gobi and Numrug of the species with rare occurrence and edge distributions need state protection. This was also suggested in the fourth national report (Terbish, 2014).

Bird

STATUS OF BIRDS IN MONGOLIA: Now, the officially recorded species number of birds in Mongolia reached 513 (Gombobaatar and Tseveenmyadag, 2019). Gombobaatar, S. and Tseveenmyadag, N. 2019. Vertebrata: Aves. S. Gombobaatar, S. Shar, U. Aibek, G. Gerelmaa and S. Bayarkhuu (eds). Biodiversity of Mongolia: a checklist of invertebrate and vertebrate animals. V.1. National University of Mongolia, Ministry of Environment and Tourism and Mongolica Publishing. Ulaanbaatar, Mongolia.

The National Birds of Mongolia - Saker falcon (*Falco cherrug* Gray)

Photo credit: S. Gombobaatar, Mongolica Publishing

Out of those species, 45 are residents (6% of all species), 67 species are vagrants (8% of all species), 91 species are breeding and non-migrants (12%), 263 species are breeding visitors and breeders (33%) and 329 species are passage migrants (41%) (Graph 1) (Gombobaatar *et al.,* 2011).

Graph 2. Bird status in Mongolia
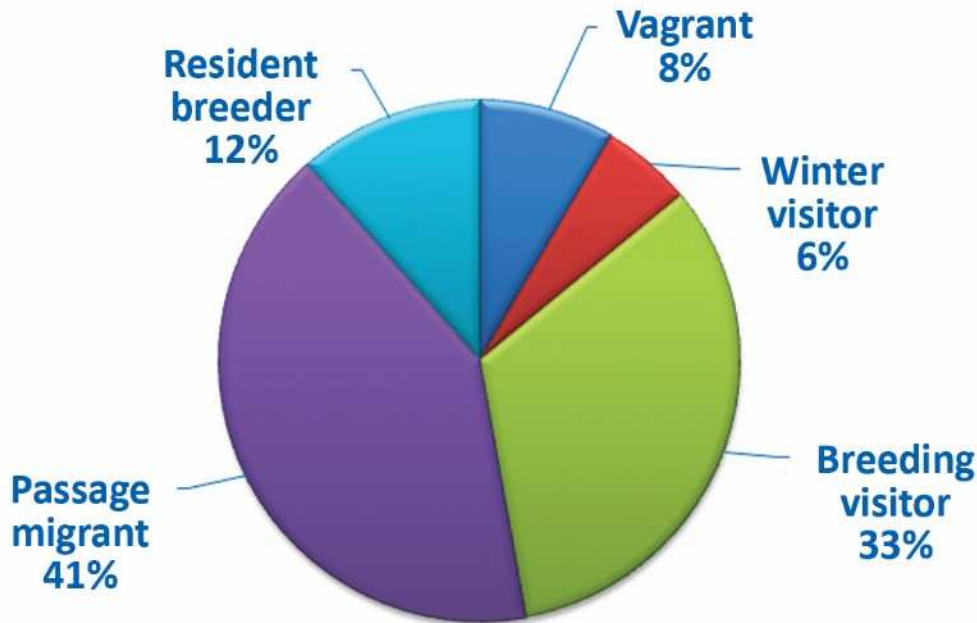
Some species can be breeding visitors and migrants at the same time or breeding and non-migrants can be winter residents, therefore, the species number adds up to more than 476 species shown in Graph 1.

Species composition of birds in Mongolia is likely to increase from year to year. As of 2019, there are 513 species of 235 genera of 69 families of 23 orders of birds in Mongolia (Gombobaatar, Tseveenmyadag, 2019). The bird species composition has been referenced to the publications by Bold & Stepanyan (1988), Fomin & Bold (1991), Dawaa et al. (1994), Reading et al. (1994), Bold et al. (2001, 2007), Stepanyan (2003), Gombobaatar (2009), Gombobaatar et al. (2011). Taxonomy, species classification, and scientific and English names of birds have been updated in accordance with the list of species produced by Gill and Donsker (eds) (2018), (IOC WORLD BIRD LIST (8.2))-International Ornithologists' Union (2018) and http://dx.doi.org/10.14344/IOC.ML.8.2). Depending on taxonomic philosophy and objectives, the International Ornithologists' Union published three major taxonomic lists of world birds: "The Clements Checklist of the Birds of the World", "The Howard & Moore Complete Checklist of the Birds of the World, 4th Edition", and "HBW Alive/Bird Life International" which have slight differences in the information provided therein. These lists are applied by ornithologists and conservationists of countries around the world. Previously, the list of Birdlife International (2018) was used, but changes were often made to species' names, taxonomy, and family sequences in the list and raptors were divided into two groups, which were hardly applicable for the raptors recorded in Mongolia. Accordingly, national ornithologists and researchers have decided to use the bird list which includes relatively stable species, genera, and family sequences and sub-species.

Mongolian names of the birds recorded in the country were referenced to the publications by Bold et al. (2001), Bold et al. (2007), Gombobaatar (2009), and Gombobaatar et al. (2011). Changes to some of the Mongolian names were made at decision of Mongolian Bird Taxonomy and Rarity Committee. To date, Mongolian names of a total of 513 bird species have been checked and updated with some new names (Gombobaatar and Tseveenmyadag, 2019).

Species numbers of birds in Mongolia are 476 species in 2009-2011; 502 species in 2011-2017; and 513 species in 2019. Lately, numbers of the birds recorded in the country are likely to increase thanks to

the factors such as ornithological studies are carried out by researchers (with master degrees in the ornithology), bird conservation has been improved, amateurs and photographers release photos of different bird species on social media, and many tour operators organize bird watching and photographing. Amongst, the Mongolian Bird Taxonomy and Rarity Committee established at the MET under the Biodiversity Convention-Global Taxonomic Initiative is a key contributor in the increased bird lists. The committee members are active and take a systematic approach in records of bird species occurring in the country through official acceptance and discussion of the birds to be newly recorded in Mongolia, decision making, and publishing the decisions made. These efforts need to be supported by ornithologists and organizations of natural studies and conservation.

Researchers and ornithologists from NUM and MOS in cooperation with Mongolian language linguists have released Mongolian names of 4700 species of world birds.

THREATENED CATEGORY OF BIRDS IN MONGOLIA: Evaluation of bird habitats, rarity and impacts were completed in 2009. Prior to this, the evaluation was applied to a select number of species. The National Bird Red List Workshop was organized in 2009, where many issues facing bird species found in Mongolia were discussed. National and international researchers and experts evaluated every bird species using the IUCN Red List criteria. Based on the evaluations, 9.3% of the total bird species recorded in the country is categorized under endangered criteria at regional and national levels. This also includes species that are near threatened.

Currently, 0.5% of birds in Mongolia are Critically Endangered, 1.5% is Endangered, 3.2% are Vulnerable, and 4.1% are Near Threatened. Out of all the species, 7.7% are Data Deficient, and 83% are Least Concern, while 18.3% are Not Applicable by IUCN Red List criteria (Graph 2) (Gombobaatar et al., 2011).
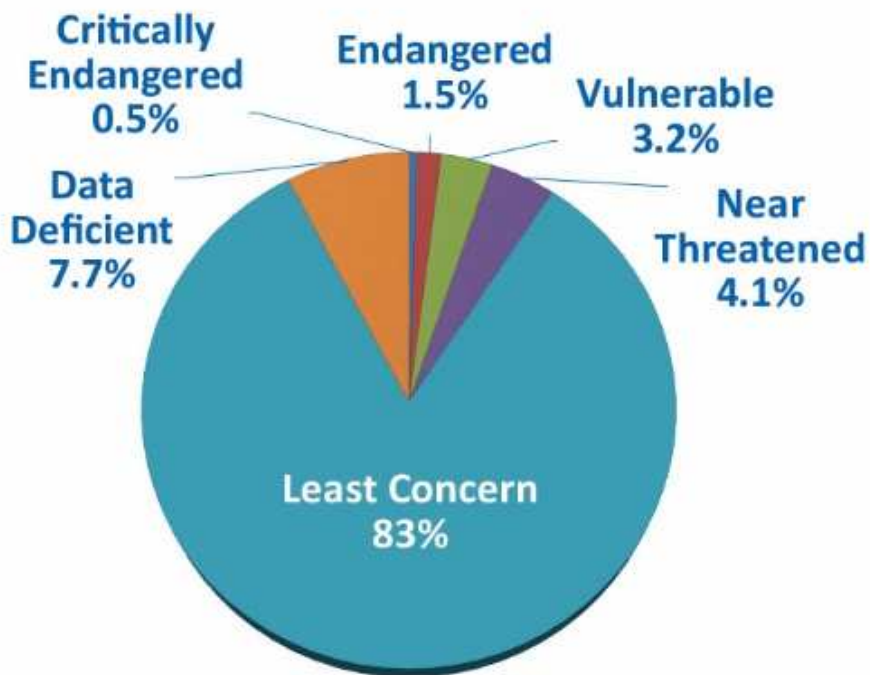
Graph 2. Threatened Category of Birds in Mongolia

A total of 36 species are endangered in Mongolia. Out of these, two species are Critically Endangered, six species are Endangered, and 12 species are Vulnerable, while 16 species are Near Threatened at the regional level (Table 4).

Table 4. Threatened Category of Birds in Mongolia

Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
Dalmatian Pelican (*Pelecanus crispus*) Siberian Crane (*Grus leucogeranus*)	White-headed Duck (*Oxyura leucocephala*) Relict Gull (*Larus relictus*) Greater Spotted Eagle (*Aquila clanga*) Pallas's Fish-eagle (*Haliaeetus leucoryphus*) Short-toed Snake-eagle (*Circaetus gallicus*) Reed Parrotbill (*Paradoxornis heudei*)	Lesser White-fronted Goose (*Anser erythropus*) Baikal Teal (*Anas Formosa*) Ferruginous Duck (*Aythya nyroca*) Lammergeier (*Gypaetus barbatus*) Eastern Imperial Eagle (*Aquila heliacal*) Saker Falcon (*Falco cherrug*) White-naped Crane (*Grus vipio*) Hooded Crane (*Grus monacha*) Asian Dowitcher (*Limnodromus semipalmatus*) Great Bustard (*Otis tarda*) Houbara Bustard (*Chlamydotis undulate*) Mongolian Ground-jay (*Podoces hendersoni*)	Great Bittern (*Botaurus stellaris*) Little Bittern (*Ixobrychus minutus*) Purple Heron (*Ardea purpurea)* Greater White-fronted Goose (*Anser albifrons*) Swan Goose (*Anser cygnoides*) Mute Swan (*Cygnus olor*) Falcated Duck (*Anas falcate*) White-tailed Eagle (Haliaeetus albicilla) Altay Snowcock (*Tetraogallus altaicus*) Common Pheasant (*Phasianus colchicus*) Common Crane (*Grus grus*) Tree Pipit (*Anthus trivialis*) White-throated Bushchat (*Saxicola insignis*) Saxaul Sparrow (*Passer ammodendri*) Yellow-breasted Bunting (*Emberiza aureola*) Ochre-rumped Bunting (*Emberiza yessoensis*)

Out of the regionally threatened bird species, there are the globally threatened bird species (e.g. Dalmatian pelican, Greater white-fronted goose, Swan goose, White-headed duck, Baikal teal, Greater spotted eagle, Pallas's fish-eagle, Eastern imperial eagle, Saker falcon, Siberian crane, White-naped crane, Hooded crane, Great bustard, Houbara bustard, Relict gull, White-throated bushchat, and Yellow-breasted bunting).

Among the birds, the *Passeridae* has the highest species, but fewer species included under the threatened category. This bird group is resilient and adaptive to the environment's changes and impacts and has an evolution path.

DISTRIBUTION AND SPECIES RICHNESS: The distribution of threatened bird species in Mongolia vary depending on the landscapes, regions and protected areas.

The species richness of Mongolian birds varies depending on the regions and habitats. Landscapes such as Mongol Daguur, Eastern steppe's Buir Lake, Ikh Khyangan, Khangai, Great Lakes Depression and Khuvsgul Darkhad Valley have high species richness; whereas Gobi districts and desert steppe landscapes are low species richness. Species richness is high in most parts of Mongolia because it is on the junction of Central, Western and Eastern Asian and Australian flyways. Dornod Mongol and Great Lakes Valley strictly protected areas are vital areas for threatened species in Mongolia (Figure 1).
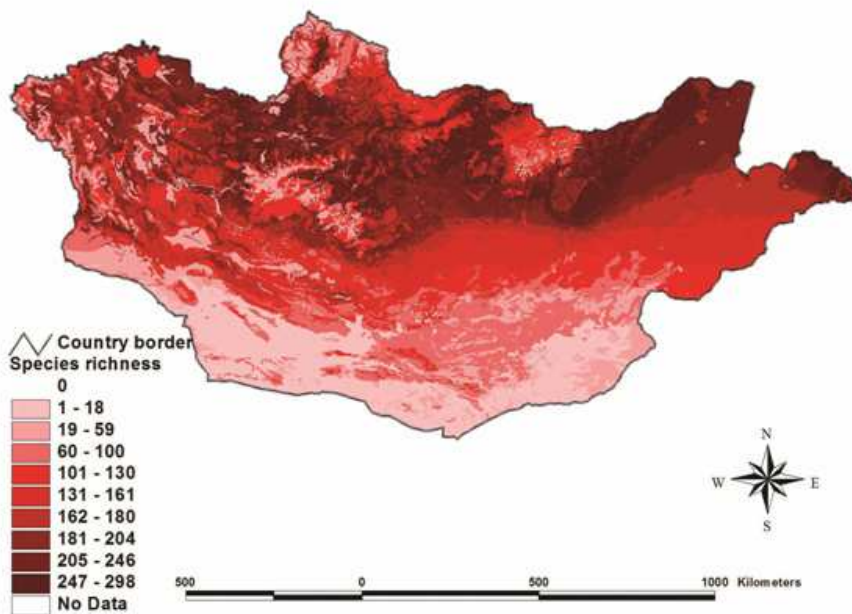
Figure 1.Distribution and Species Richness of Birds in Mongolia

THREATS TO BIRDS: Threats were evaluated using the IUCN Red List threat criteria as well as conservation status criteria (IUCN2003, Lamoreux et al., 2003). Based on the evaluation, the biggest threats to Mongolian birds were habitat loss and degradation at 38.1%, human disturbance at 13.6%, pollution at 11% and changes in native species dynamics at 10.7% (Gombobaatar *et al.* 2011 & 2011a). The largest threats to birds are habitat loss and degradation due to mining and infrastructure developments, establishment of tourist camps and spread of wild fires in the fall and autumn. These factors must be considered for the conservation actions.

Illegal hunting of birds is still a serious issue. Altai snowcock, Black kite and Mongolian groundjay are being hunted for exhibit purposes as well as medicinal uses. Although, exhibiting hunted birds is diminishing, medicinal uses of bird species is still in demand.

National and international research has found that many birds are being electrocuted due to the environmentally unfriendly power lines and poles. To alleviate this threat, organizations such as the Mongolian Ornithological Society, Ministry of Environment and Green Development, National University of Mongolia, Academy of Sciences, Wildlife Consultancy UK and the Wildlife Science and Conservation Center of Mongolia are collaborating in producing action plans. The number of raptors being electrocuted on the new 15 KV lines is likely to increase in the spring and autumn seasons.

A second threat affecting waterfowl are nets as well as water and air pollution (caused by mining operation), predators, avian flu and other diseases.

The way these threats affect birds vary with each species. For example, species of Galliformes are being mostly threatened by illegal hunting, cranes and other waterfowls are being threatened by habitat loss due to human activities, livestock grazing and aridity, while raptors' biggest threats are power lines and pesticides. These threats, and that of mining developments, are expected to increase in the future.

Since 1994, Saker Falcons have been exported to Arabian countries for scientific and commercial purposes. The Ministry of Culture, Sport and Tourism together with scientists from Mongolian Ornithological Society and National University of Mongolia petitioned to proclaim the falcon as the national bird of Mongolia in 2012. Based on a national public survey, Saker Falcon received the most votes and was chosen as the national bird (Gombobaatar, 2013). The Government accepted the Ministry of Environment and Green Development's motion to prohibit Saker Falcon trading for 5 years starting in 2013. Professor S. Gombobaatar's "Mongolian Saker Falcon" book, which details the life of this species, was published in 2013.

Research on Mongolian migrating birds was conducted by national and international scientists. As a result, migrating routes of species such as Swan goose, Bar-headed goose, Whooper swan, Saker falcon, Cinereous vulture, Amur falcon, White-naped crane and Northern lapwing, and their threats has been identified.

Oyu Tolgoi, one of the largest mining companies in Mongolia, are funding the monitoring of species inhabiting the surrounding sites. National and international experts are studying and monitoring the status of species such as Saker falcon, Houbara bustard and Shorttoed snake eagle. Unfortunately, not all mining companies are conducting similar studies.

Due to a chemical toxin, Bromadiolon, used as a rodenticide for Brandt's Vole, many raptors are dying out. Government and non-government organizations have reached an agreement to cease using this preparation. However, it is still being used in some parts of country.

TRENDS OF BIRD POPULATIONS IN MONGOLIA: The population trends of birds were evaluated from 2000-2011 using the Birdlife International methods (2011). Based on the comparisons of each year, out of 476 species, 64.9% have stable populations, 4% of species' population is likely to decline and 0.1% of the species' population is declining while 31% of species' population trend is indeterminate (Gombobaatar et al., 2011&2011a).

Based on this general evaluation, the majority of the bird population is stable, while a small amount of the population is declining due to human activities and changes in natural circumstances. It must be noted that 31% of the population's trend cannot be evaluated. A further study on the population is needed as well as an evaluation of the Bird Red List in 2019.

Changes in the bird population have little immediate effect on Mongolians' livelihood. However, there is dispute between the herders and protected areas management over pastureland and water resource.

The development of special interest tourism, sustainable and responsible forms of tourism will need the collaboration of the local communities. Ecotourism and community based tourism will ensure the conservation of birds and their habitats while providing a steady income for herders.

Under the project "Taxonomic Inventory and Database on Fauna, Flora, and Micro-Organism in Mongolia" implemented by the NUM with funding from the Fund for Sciences and Technology in accordance with the MET request, a database was created with details on distributions, key identifications, vegetation, and photographs of 502 bird species (Gombobaatar et.al., 2018).

Special Protected in Areas such as Numrug, Altan els, Mongol Daguur, Onon-Balj, Khugnu Khaan, Otgontenger, Uvs, Khar-Us lake, Tsambagarav, Toson Khulstai, Khar Yamaat and Ikh Nart are high in species richness, and conservation efforts must be implemented at these sites (Gombobaatar et al., 2011).

As noted above, that there are 30 species categorized as Data Deficient, so that detailed studies on these species are needed through incorporation in the policy document.

Mammal

STATUS OF MAMMALS IN MONGOLIA: There are 128 species of mammal recorded in Mongolia Clark *et al*. 2006). A list of biological species in Mongolia includes 140 species of 81 genera of 24 families of nine orders of mammal (Batsaikhan, 2019). 16% are regionally threatened, of which 2% are Critically Endangered (Gobi Bear, Przewalski's wild horse and Red deer), and 11% are Endangered (Mongolian marmot, Eurasian beaver, Alashan ground squirrel, Small five-toad jerboa, Mongolian three-toed jerboa and others) while 3% are Vulnerable (Long-eared jerboa, Sable, Black-tailed gazelle, Reindeer). Numbers of mammal species in Mongolia are relatively stable, but some changes were made to names and numbers of species of Chiroptera and Rodentia according to the molecular biological studies. Currently, records and data on Eurasian badger and Asiatic wild dog are still unclear for now. A new species of wild cat was recorded in Mongolia, but it has not officially included in the list of mammals in Mongolia. The Mongolian Mammal Taxonomy Sub-Committee needs to be active in solving of the issues including updates in taxonomy, species, and Mongolian names of mammals in the country the mammal researchers should support the Sub-Committee.

Black-tailed gazelle (*Gazella subgutturosa* Güldenstädt)

Photo credit: S. Gombobaatar, Mongolica Publishing

THREATENED CATEGORY OF MAMMALS IN MONGOLIA: Of the 128 species of mammals in Mongolia, 16% are regionally threatened, of which 2% are Critically Endangered (Gobi bear, Przewalski's wild horse and Red deer), and 11% are Endangered (Mongolian marmot, Eurasian beaver, Alashan ground squirrel, Small five-toed jerboa, Mongolian three-toed jerboa and others) while 3% are Vulnerable (Long-eared jerboa, Sable, Black-tailed gazelle, and Reindeer). Almost 6% of the population is categorized as near threatened. The Asiatic wild dog is regionally extinct (Table 5) (Clark *et al*. 2006).

Table 5. Threatened Category of Mammals in Mongolia

Critically Endangered (CR)	Endangered (EN)	Vulnerable (VU)	Near Threatened (NT)
Brown bear *(Ursus arctos gobiensis)* Przevalski's wild horse	Mongolian marmot *(Marmota sibirica)*	Long-eared jerboa *(Euchoreutes naso)* Sable *(Martes zibellina)*	Brown squirrel *(Sciurus vulgaris)* Eurasian lynx *(Lynx lynx)*

(Equus ferus przewalskii) Red deer *(Cervus elaphus)*	*Alashan ground squirrel (Spermophilus alashanicus)* Eurasian beaver (*Castor fiber*) Little jerboa (*Allactaga elater*) Zungarian jerboa (*Stylodipus sungorus*) Tamarisk gerbil (*Meriones tamariscinus*) Snow leopard *(Uncia uncia)* Asiatic wild ass *(Equus hemionus*) Wild bactrian camel *(Camelus bactrianus ferus)* Argali sheep *(Ovis ammon)* Mongolian gazelle *(Procapra gutturosa)* Mongolian saiga *(Saiga tatarica mongolica)*	Black-tailed gazelle *Gazella subgutturosa* Reindeer *(Rangifer tarandus)*	Pallas' vat (*Otocolobus manul)* Grey wolf (*Canis lupus*) Corsac fox *(Vulpes corsac)* Red fox *(Vulpes vulpes)* Wild boar *(Sus scrofa)* Siberian Ibex *Capra sibirica*

	Musk deer (*Moschus moschiferus*)		
	Elk or Moose (*Alces alces*)		

POPULATION STATUS AND TREND OF SOME MAMMAL SPECIES:

Studies of the population trend of Bactrian camel (*Camelus bactrianus ferus*), conducted in 2012 showed a steady increase.

POPULATION STATUS AND TREND OF GOBI BEAR (*Ursus arctos gobiensis*): a distribution range of the Gobi bear covers 18 000 sq. km in a part "A" of Great Gobi Strictly Protected Area (SPA). No specific changes are seen in its distribution range and population size even though habitat area was under a decade long drying out process. It shows that the species has been well adapted to its distribution area. When comparing previous years' population studies to that of recent studies on the Gobi Bear, there were no significant changes and the population is still sparse. According to the genetic analysis in 2014, the Gobi bear was defined a distinctive sub-species in its taxonomic status (Report on State of the Environment of Mongolia, 2017-2018).

The Government of P.R.China delivered a technical assistance to a project for the Gobi bear conservation in 2018 and under which equipment and devices worth MNT 250 million were made available. Under the project, a team of researchers from the two countries has started a joint study on the species population, genetics, and improvement of its habitat in Great Gobi SPA (Report on State of the Environment of Mongolia, 2017-2018).

The small population of this species in the Gobi desert has drawn attentions of governmental and non-governmental organizations lately, in particular since 2013, and there have been deliberate attempts at conservation (e.g. to improve habitat conditions through deliberate precipitation enhancement) as well as other population and taxonomic studies (Table 6).

Table 6. Population Size of Gobi Bear

Years	Population size	Source
1960	15-20	Bold, 1967
1970	20<	Bold, Dulamtseren, 1981
1980	20-25	Dash, Tumur, 1983; Bugaev, Tumur, 1985
1985	25-30	Jirnov, Ilyinskii,1985
1990	20<	Shaller et.al., 1993; McCarthy, 2000
1995	30-35	Tulgat, 1995
2004	20<	Batsaikhan *et al.*, 2004; Amgalan et.al., 2005
2011	22-31	Odbayar et.al., 2011
2013	30<	Mijiddorj, 2013
2018	33	P. Samiya, Battogtokh (unpublished, 2018)

POPULATION STATUS AND TREND OF SAIGA ANTELOPE (*Saiga tatarica*):

In 2018, the MoET completed the tasks to take entire distribution range of the Saiga antelope under special protection, to expand sizes and upgrade status of established Protected Areas, and conduct ecological studies with financial and technical support of WWF Mongolia. In the meantime, a research project for re-introduction will be started in June, 2019 at initiative of WWF Mongolia.

Population of the Mongolian saiga antelope has dramatically declined due to the factors such as outbreak of Peste des petits ruminants (PPR) in 2016-2017 and severe winter condition in 2017-2018. According to the inventory held in March, 2018, its population was estimated at over 3,000, while it was likely to slightly increase as per the inventory in December, 2018 (Graph 2) (Report on State of the Environment of Mongolia, 2017-2018).

Graph 2. Fluctuations in Mongolian saiga population
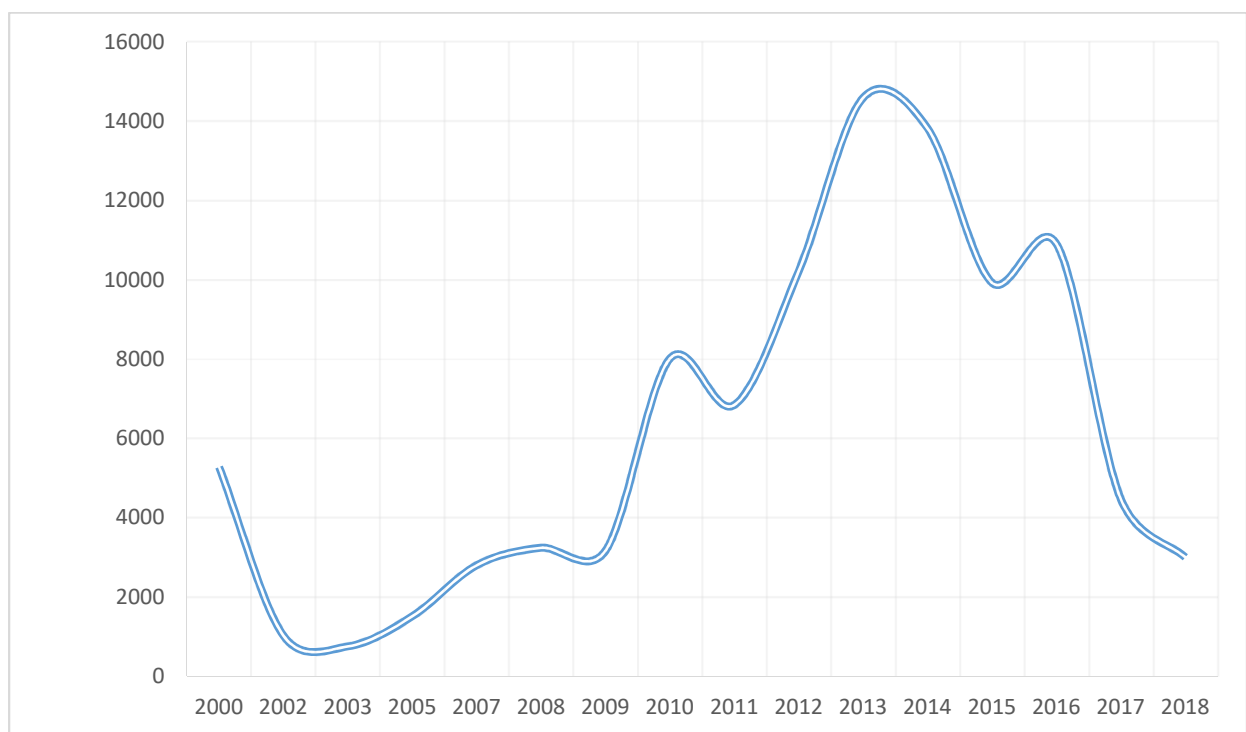
As of 2017, distribution of the Mongolian saiga antelope was shrunk in Durgen Khuren steppe and Khuisiin Gobi, where the PPR disease was outbreak, while the species was evenly distributed in Shargyn Gobi, where the disease was spread late, according to the study.

As a result of the conservation actions and programme for Mongolian saiga antelope implemented in the country since 1998, the Mongolian saiga antelope re-occurred in its historical distribution ranges: territories of Zavkhan soum of Uvs province, Durvuljin soum of Zavkhan province, Khukh Morit of Govi-Altay province, and Durgun soum of Khovd province. In 2017, a total of 201 individuals of Mongolian saiga antelope were recorded throughout these areas, with the highest individuals in areas of Mankhan Uushii Khuduu and Tevsh of Khovd province (Report on State of the Environment of Mongolia, 2017-2018).

Lately, population size of the Mongolian saiga antelope has been highly fluctuated due to the climatic conditions, shortage of vegetation, overgrazing and outbreak of infectious disease among domestic

and wild animals, etc. To safeguard and preserve the species population and genetics, the actions to take its distribution areas under state protection, expand established Protected Areas, upgrade status of some established Protected Areas and re-introduce in the most suitable area within its ranges are needed.

POPULATION DYNAMICS AND TREND OF PRZEVALSKI'S WILD HORSE: The reintroduction of the Przevalski's wild horse has been successfully implemented with dedicated efforts of international researchers, namely those from the Netherland, Germany, Switzerland, Australia, and France since 1992. First, five individuals of Takhi were re-introduced with support of Christian Osvald Foundation to a territory of Bij *bag* of Bugat *soum* of Govi-Altay province. In recent years, the Prague Zoo and Czech Development Agency have been engaged in financing and implementing the programme for re-introduction of Przevalski's wild horse in the wild since 2011. Records on the Przevalski's wild horse released in its home range in the past include 84 individuals in Khustai Range, 128 individuals in Takhiin tal, and 26 individuals in Khomiin tal areas. As of 2018, there were a total of 649 individuals including 336 individuals in Khustai Range, 236 individuals in Takhiin tal, and 77 individuals of Przevalski's wild horse in Khomiin tal areas are recorded. As such, Mongolia has become the country with the highest number of Przevalski's wild horse in the world (Graph 3) (Report on State of the Environment of Mongolia, 2017-2018).

Graph 3. Population of the Przevalski's wild horse re-introduced in Mongolia
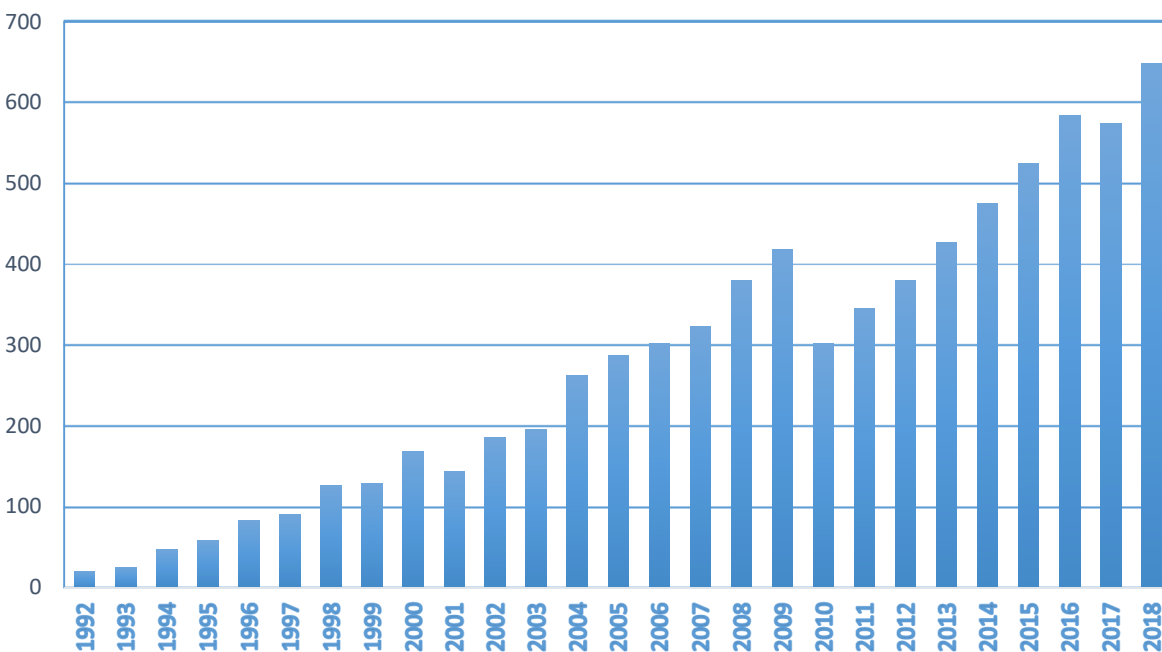
POPULATION STATUS OF OTHER MAMMALS IN MONGOLIA: The status of the population of forest ungulates in Mongolia has been charted. Based on recent studies, populations of Moose, Red deer and Siberian musk deer are likely to reduce while populations of Wild boar and Roe deer are increasing.

Based on results of the researches and studies on populations of very rare and rare fauna species conducted in last two decades, the Gobi bear-28; Brown bear-500; Musk deer-6,500; Central Asian beaver-300; Eurasian otter-100; American mink -3,500, Snow leopard-900-1,200; Przevalski's wild horse-538; Red deer – about 10,000; Asiatic wild ass -10,000; Siberian ibex-11,000, Argali sheep -13,000, Elk- 16,400; Bactrian camel-800-1,200; Reindeer -140-200, Black-tailed gazelle-12,000 (National Programme for Very Rare and Rare Fauna Conservaiton, 2011), wild pig 35,000; and Saiga antelope about 1,000 heads (Report

on State of the Environment of Mongolia, 2017-2018). Additionally, there are about 3 million heads of Mongolian gazelle. When compared these population sizes to those in 1970-1980 and in 1990-2000, they were declined by 70-50% and increased by 20-40%, respectively. For the last six years, no consolidated inventories and assessments on fauna have been carried out, but partial inventories were conducted for assessment of certain species' stocks in some selected regions (Report on State of the Environment of Mongolia, 2017-2018).

There haven't been any significant changes to mammal populations since 2009 (fourth National Report) as reported by scientists. For example, based on the results of the 2010 steppe ungulate population study conducted across Mongolia, the population of Siberian ibex was 35,300, Mongolian gazelle was 5,700,000, and Black-tailed gazelle was 11,900, while Asiatic Wild Ass population was 14,000 (Report on State of the Environment of Mongolia, 2017-2018).

WWF Mongolia Programme Office in cooperation with the Ministry of Environment and Tourism started a public event "Great Gobi-6", which includes the regionally and globally endangered Wild bactrian camel, Gobi bear, Przevalski's horse or Takhi, Khulan or Asiatic wild ass, Mongolian saiga antelope and Black-tailed gazelle, in 2016 to mobilize governmental and non-governmental organizations and local communities into conservation of the species and their home Gobi-Desert ecosystem. Since then, the event has been successfully undertaken in the country.

"Biodiversity and Adaptation to Climate Change" Project is implemented by the Ministry of Environment and Tourism in accordance with the Financial Cooperation Agreement signed by the Governments of Mongolia and Germany, through the KfW Development Bank. Under the project, a research project on baselines on biodiversity in Protected Areas and their Buffer Zones was implemented under collaborative efforts from governmental and non-governmental organizations, and research institutions, namely the MOS, the Department of Biology at the NUM, Mongolica Consulting LLC, the MAS, Taimen Conservation Fund, 15 PA Administrations in 2016. The research had 13 target fauna species and six additional species. Research and studies targeted: Taimen and Musk deer (additional: lenok) in Khan Khentii; Mongolian marmot in Gorkhi-Terelj; Mongolian marmot, Red deer, and Saker falcon in Khustai Range; Mongolian gazelle, Mongolian marmot in Dornod Mongol (Eastern Mongolia); Mongolian gazelle, White-naped crane, Swan goose (additional: Amur grayling) in Mongol Daguur; Mongolian gazelle, Mongolian marmot in Toson Khulstai; Great bustard, White-naped crane, Taimen (additional: Amur grayling) in Onon-Balj; Mongolian marmot, Red deer in Orkhon Valley; Saussurea involucrate, Red deer, Siberian ibex (additional: Hodgson's stonechat) in Otgontenger; Siberian ibex, Mongolian marmot (additional: Altai snowcock) in Tarvagatai Range; Siberian ibex, Mongolian marmot (additional: Altai snowcock) in Khangay Range; Taimen, Elk (additional: sturgeon) in Zed-Khantay-Buteel Range; Taimen, Red deer (additional: Siberian flying squirrel) in Ulaan Taiga; Argali sheep, Siberian ibex, Elk (additional: Siberian flying squirrel) in Khoridol Saridag; and Taimen, Red deer (additional: Reindeer) in Tengis- Shishged. Results from these researches and studies in 15 Protected Areas show wide range densities and stocks of the target and selected species (Table 7).

Table 7. Densities of target species within Protected Areas

No	Protected Area (PA)	Taxonomy of the Species ийн ангилал зүй	Protection status		Distri-bution range within the PA (ha)	Population density, stock	Threats	Vulnera-bility assess-ment
			Inter-natio nal	Regio -nal				

1	**Khan Khentii SPA**	Pine (*Pinus sibirica*)	-	-	268,376	51,642,750 cubic meter	▪ Forest fire ▪ Over-harvesting of cones ▪ Collection of immature cones by beating into main stems ▪ Forest pests ▪ Unsustainable harvest and use of natural by-products	9.45
		Taimen (*Hucho taimen*)	-	**EN**	555 km	0.0072 individuals / 1 km	▪ Illegal fishing ▪ Mining ▪ Habitat degradation	10.95
		Musk deer (*Moschus moschiferus*)	**VU**	**EN**	679,535	0.35 individuals / 1000 ha	▪ Forest fire ▪ Illegal hunting ▪ Overlap of grazing areas ▪ Timbering ▪ Habitat degradation ▪ Raptors' impact ▪ Collectors of nut ▪ Collectors of berries	12.9
2	**Gorkhi-Terelj NP**	Cedar(*Pinus sibirica*)	-	-	24,702	5,059,040 cub.m	▪ Forest fire ▪ Over-harvesting of cones ▪ Collection of immature cones by beating into main stems ▪ Forest pests ▪ Unsustainable harvest and use of natural by-products	10.4
		Mongolian marmot (*Marmota sibirica*)	LC	**EN**	25,325	69.7 individuals / 1000 ha stock: 1,763.9 individual	▪ Illegal hunting ▪ Habitat degradation ▪ Raptors' impact ▪ Human and livestock impact	13.1

		Musk deer (*Moschus moschiferus*)	VU	EN	37,387	0.05 individual per 1000 ha	▪ Forest fire ▪ Illegal hunting ▪ Overlap of grazing areas ▪ Timbering ▪ Habitat degredation ▪ Raptors'impact ▪ Collectors of nuts and berries ▪ Tourism	9.5
3	**Khustai NP**	Mongolian marmot (*Marmota sibirica*)	LC	EN	19,464	4600 individuals / 1000 ha	▪ Illegal hunting ▪ Raptors' impact ▪ Human & livestock impact ▪ Habitat degredation	7.5
		Red deer (*Cervus elaphus*)	LC	CR	26,797	11.5 individuals / 1000 ha stock:585 individuals	▪ Illegal hunting ▪ Habitat degredation ▪ Raptors'impact	8.25
		Saker falcon (*Falco cherrug*)	EN	VU	-	0.03 individuals / 1000 ha Stock: 16 individuals	▪ High tension power line ▪ Human & livestock impact	8.4
4	**Dornod Mongol SPA**	Mongolian gazelle (*Procarpa gutturosa*)	LC	EN	2,423,962	15.4 individuals / 1000 ha stock:37,340.7 individuals	▪ Illegal hunting ▪ Oil extraction ▪ Steppe fire ▪ Infectious disease e.g. Foot & mouth ▪ Affected by drought & dzud	12.3
		Mongolian marmot (*Marmota sibirica*)	LC	EN	-	1.4 individuals / 1000 ha	▪ Raptors' impact ▪ Human & livestock impact	14.1

5	**Mongol Daguur SPA**	Mongolian gazelle *(Procarpa gutturosa)*	**LC**	**EN**	690,158	90 individuals / 1000 ha stock:66,696.2 individuals	▪ Illegal hunting ▪ Steppe fire ▪ Habitat fragmentation by railroad ▪ Infectious disease e.g. Foot & mouth ▪ Affected by drought & dzud ▪ Habitat degredation	13
		Swan goose *(Anser cygnoides)*	**VU**	**NT**	50,000	100.4 individuals / 1000 ha Stock:11,905 individuals	▪ Habitat loss (dried stream & river etc.) ▪ Habitat degradation by human & livestock ▪ Illegal collection & export of water insects to China	10
		White-naped crane*(Grus vipio)*	**VU**	**VU**	50,000	0.7 individuals/ 1000 ha Stock:34.7 individuals	▪ Habitat loss & degradation ▪ High human & livestock impact	13
6	**Toson Khusltai NR**	Mongolian gazelle *(Procarpa gutturosa)*	**LC**	**EN**	450,480	201.8 individuals / 1000 ha Stock:90,902.6 individuals	▪ Illegal hunting ▪ High human & livestock impact ▪ Steppe fire ▪ Infectious disease e.g. Foot & mouth ▪ Affected by drought & dzud ▪ Habitat degredation	12.1
		Mongolian marmot *(Marmota sibirica)*	**LC**	**EN**	450,480	106.6 individuals / 1000 ha Stock:455 individuals	▪ Illegal hunting ▪ High human & livestock impact ▪ Steppe fire ▪ - Habitat degredation	11.3

7	**Onon-Balj NP**	White-naped crane (*Grus vipio*)	VU	VU	76,520	3 individuals / 1000 ha Stock:254.9 individuals	• Habitat loss & degradation • High human & livestock impact	13.05
		Great bustard (*Otis tarda*)	VU	VU	466,560	0.14 individuals / 1000 ha Stock:66.5 individuals	• High human & livestock impact • Habitat degredation • Raptors' impact	12.9
		Taimen (*Hucho taimen*)	-	EN	518 км голын урт	1.09 individuals / 1 km (Tsogtsaikhan, 2013)	• Mining • Habitat degradation • Illegal hunting	11.85
8	**Orkhon Valley NP**	Mongolian marmot *(Marmota sibirica)*	LC	EN	25,299	84,9 individuals / 1000 ha Stock: 2148.2 individuals	• Illegal hunting • High human & livestock impact • Habitat degradation • High tourism impact in Nariin Am	13
		Red deer (*Cervus elaphus*)	LC	CR	55,737	2.1 individuals /1000 ha Stock: 100-120 individuals	• Illegal hunting • High human & livestock impact • Habitat degradation • Unregulated tourism activities	7.2
9	**Otgontenger SPA**	Red deer (*Cervus elaphus*)	LC	CR	109,169	2.8 individuals / 1000 ha Stock: 310 individuals	• Illegal hunting • High human & livestock impact • Forest fire • Timbering • Habitat degredation & loss • Drought & dzud	9.6

		Siberian ibex (*Capra sibirica*)	LC	NT	4,342	4.25 individuals / 1000 ha Stock: 18 individuals	▪ Illegal hunting ▪ High human & livestock impact ▪ Habitat degredation ▪ Drought & dzud	11.1
		Saussurea involucrate, (*Saussurea involucrate*)	-	EN	2,204	11.34 individuals / 1000 ha	▪ Habitat degredation ▪ Illegal collection & harvest	13.7
10	**Tarvagatai Range**	Siberian ibex (*Capra sibirica*)			26,892	1.8 individuals / 1000 ha stock: 49 individuals	▪ Illegal hunting ▪ High human & livestock impact ▪ Habitat degredation ▪ Affected by drought & dzud	11.1
		Red deer (*Cervus elaphus)*	LC	CR	95,458	2 individuals / per 1000 ha stock: 199 indivi-duals	▪ Illegal hunting ▪ High human & livestock impact ▪ Forest fire ▪ Timbering ▪ Habitat degredation ▪ Affected by drought & dzud	7.6
11	**Khangay Range**	Mongolian marmot (*Marmota sibirica*)	LC	EN	136,503	48 indivi-duals / 1000 ha Stock: 6595 indivi-duals	▪ Illegal hunting ▪ High human & livestock impact ▪ Habitat degredation	12.9
		Siberian ibex (*Capra sibirica*)	LC	NT	146,354	2 indivi-duals / 1000 ha Stock: 282 indivi-duals	▪ Illegal hunting ▪ High human & livestock impact ▪ Habitat degredation ▪ Affected by drought & dzud	12.1
		Altai snowcock	LC	NT	146,354	2.6 indivi-duals / 1000 ha	▪ Illegal hunting ▪ High human & livestock impact	10.9

		(*Tetraogallus altaicus*)				stock: 313 indivi-duals	▪ Habitat degredation ▪ Sudden cold snap & heavy snow fall	
12	**Zed-Khantai –Buteel Range**	Taimen (*Hucho taimen*)		**EN**	-	1 indivi-dual/1ha	▪ Habitat degredation ▪ Illegal hunting	13.1
		Moose (*Alces alces*)	**LC**	**EN**	256,850	0.36 indivi-duals/ 1000 ha stock: 93.99 indivi-duals	▪ Raptors' impact ▪ Habitat degredation ▪ Illegal hunting ▪ Collectors of nut & berries in autumn;	11.1
		Wild boar (*Sus scrofa*)	**LC**	**NT**	605,008.9	0.88 indivi-duals / 1000 ha stock: 535.9 indivi-duals	▪ Illegal hunting ▪ Raptors' impact ▪ Habitat degredation ▪ Намар жимсчид, самарчид	9.3
13	**Ulaan Taiga**	Taimen (*Hucho taimen*)		**EN**	-	0.42 / 1 km	▪ Habitat degredation ▪ Illegal hunting	11
		Red deer (*Cervus elaphus*)	**LC**	**CR**	543,499.8	0.49 indivi-duals / 1000 ha Stock: 264.25 individuals	▪ Illegal hunting ▪ Forest fire ▪ Habitat degredation ▪ Timbering, ▪ Collection & harvest of nut & berries	7.5
14	**Khoridol Saridag**	Argali sheep (*Ovis ammon*)	**VU**	**EN**	84,303.2	0.69 indivi-duals / 1000 ha Stock: 57.98 indivi-duals	▪ Raptors' impact ▪ Habitat degredation ▪ - Illegal hunting	12.15

#	Area	Species					Threats	
		Siberian ibex (*Capra sibirica*)	LC	NT	127,861.3	1.29 indivi-duals / 1000 ha Stock: 165.29 indivi-duals	▪ Raptors' impact ▪ Habitat degradation ▪ Illegal hunting	12.15
		Moose (*Alces alces*)	LC	EN	79,680.3	0.4 indivi-duals / 1000 ha Stock: 32.38 indivi-duals	▪ Raptors' impact ▪ Habitat degradation ▪ Illegal hunting ▪ Collection & harvest of berries in autumn	11.1
15	**Tengis-Shishged**	Taimen *(Hucho taimen)*		EN		1.09 indivi-duals / 1 km	▪ Habitat degradation ▪ Illegal hunting	10.95
		Red deer (*Cervus elaphus)*	LC	CR	487,702.4	0.34 indivi-duals / 1000 ha stock: 167.69 individuals	▪ Illegal hunting ▪ Forest fire ▪ Habitat degradation ▪ Timbering, ▪ Collection & harvest of nut & berries	7.65

NEGATIVE IMPACTS ON MAMMALS:

Changes to the natural landscape and condition are negatively affecting the wild mammals. Especially for the species inhabiting the Gobi, such as the Gobi bear, Bactrian camel, Mongolian saiga antelope, Black-tailed gazelle and Asiatic wild ass, water shortage and habitat loss are impacts of climate change. The Mongolian governmental and other non-governmental organizations are working together to alleviate these threats. For example, a generator was installed at the Great Gobi Strictly Protected Area A in 2013 to induce precipitation and improve the habitat of the Gobi bear.

Natural threats such as desertification, water shortage and land degradation are affecting the landscape of the species habitat, which is changing year to year. Drying out of oases in the Gobi has changed the seasonal position of species such as Wild bactrian camel, Asiatic wild ass and Black-tailed Gazelle.

It is common for mammals to migrate across the border and the grazing potential of this side of the border is deteriorating. Threats of logging and wild fires are increasing.

As stated in the Constitution of Mongolia, the wildlife is state property and the proper use and conservation of these species is regulated by the constitution, Law on Environment Protection (1995), Law on Wildlife (2012) and other applicable rules and regulations. Hunting of wild animals is also regulated by applicable laws.

The conservation and sustainable use of Mongolian fauna is vital to the subsistence of herders and the national economy. For example, fees from hunting regulations bring in concentrations of funds to the state budget. Also, animals provide for a certain part of the Mongolian diet and household consumption.

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Summary table on Mongolia's performance towards implementation of National strategy and its contribution to the Global Strategic Plan for Biodiversity 2011-2020.

Level of Progress	Score
On track to exceed target	5
On track to achieve target	4
Progress towards target but at an insufficient rate	3
No significant change	2
Implementation not started yet	1
Irrelevant	0

(The assessment matrix is provided in separate file)

Aichi Targets	Target 1.				Target 2.			Target 3.					
Generic indicators	Trends in awareness and attitudes to biodiversity			Trends in public engagement with biodiversity	Trends in incorporation of measures of stock and flow of natural resources into national accounting	Trends in number of countries that have assessed values of biodiversity, in accordance with the Convention	Trends in integration of biodiversity and ecosystem service values into sectoral and development policies	Trends in the number and value of incentives, including subsidies, harmful to biodiversity, removed, reformed or phased out			Trends in development and application of incentives that promote biodiversity conservation and sustainable use		
Specific Indicators/National Goals	Biodiversity Barometer	Online interest in biodiversity (Google Trends)	trends WAZA global visitor survey	No specific indicators identified	Number of countries implementing natural resource accounts, excluding energy, within the System of Environmental-Economic Accounting (SEEA)	Progress towards national targets established in accordance with Aichi Biodiversity Target 2 of the Strategic Plan for Biodiversity 2011-2020 (indicator for SDG target 15.9)	Number of countries that have integrated biodiversity in National Development Plans, poverty reduction strategies or other key development plans	Trends in potentially harmful elements of government support to agriculture (produced support estimates)	Trends in potentially harmful elements of government support to fisheries	Agricultural export subsidies (indicator for SDG target 2.b)	Number of countries with national instruments on biodiversity-relevant taxes, charges and fees	Number of countries with national instruments on REDD plus schemes	Number of countries with national instruments on biodiversity relevant tradable permit schemes
Goal 1: The education for sustainable development is integrated into all level education curricula and this information is disseminated by at least 5% of mass media.				4									
Goal 2: Establish the biodiversity sub-database through improving the content and access to the National Environmental Information Database and ensure its use in decision making.		3											
Goal 3: Create a legal environment for the protection, sustainable use, and fair and equitable sharing of benefits arising from widely used and economically significant genetic resources, and to implement sustainable use, and protection from genetic erosion and depletion.													
Goal 4: The national programs on conservation of rare and endangered animal and plant species is fully implemented.													
Goal 5: At least 30% of each representative of main ecosystems, all patch and vulnerable to climate change ecosystems are included in to the National Protected Area network and their management is improved.													
Goal 6: Protect soil and water resources from chemical and nutrient pollution.													
Goal 7: Increase forest cover to 9% by 2025 through the improvement of forest management, and thereby protect forest biodiversity.													
Goal 8: Introduce management techniques for the sustainable use and conservation of natural resources, especially game animal resources, by mean of utilizing the creation of partnerships between government, local citizens, and private sector.													
Goal 9: Taking into account grazing capacity and livestock population size, utilize legislative and economic leverages to reduce pasture degradation by up to 70% and increase quality of existing pastures.													

Goal												
Goal 10: Modernize industrial farming techniques and activities to meet requirements for food safety and conservation of biodiversity in the environment's agricultural ecosystem.												
Goal 11: The biodiversity related indicators are reflected in the national evaluation system to monitor the implementation of project and programmes of relevant sectors.				3	3	4						4
Goal 12. Create a legal environment where subsidies or financial assistance are prohibited for use in agriculture, mineral resource extraction, infrastructure, energy, light industry, food manufacturing, and service industry projects and actions deemed to be harmful to or potentially harmful to biological diversity in accordance with environmental strategy evaluations.							2		2	3	3	
Goal 13: Taking into account the value and importance of pasture, water resources and forest ecosystem services, develop and implement a framework for sustainable use and conservation of natural resources in which social and economic benefits of these resources are appropriately protected.												
Goal 14: Identify potential sources of funding that are needed to implement the national biodiversity program and create a framework for efficient use of these funds.												

Aichi Targets	Target 4.															
Generic indicators	Trends in population and extinction risk of utilized species, including species in trade					Trends in use of natural resources and/or related concepts				Ecological limits assessed in terms of sustainable production and consumption				Trends in biodiversity of cities		Trends in extent to which biodiversity and ecosystem service values are incorporated into organizational accounting and reporting
Specific Indicators/National Goals	Red List Index (impacts of utilization)	Percentage of Category 1 nations in CITES	Red List Index for species in trade	Proportion of traded wildlife that was poached or illicitly trafficked (indicator for SDG target 15.7)	Proportion of national exclusive economic zones managed using ecosystem-based approaches (indicator for SDG target 14.2)	Ecological footprint	Material footprint (MF) and MF per capita, per GDP (indicator for SDG targets 8.4 and 12.2)	Domestic material consumption (DMC) and DMC per capita, per GDP (indicator for SDG targets 8.4 and 12.2)	Number of countries with sustainable consumption and production (SCP) national action plans or SCP mainstreamed as a priority or target into national policies(indicator for SDG target 12.1)	Human appropriation of net primary productivity	Human appropriation of fresh water (water footprint)	Change in water use efficiency over time(indicator for SDG target 6.4)	Level of water stress: freshwater withdrawal as a proportion of available freshwater resources (indicator for SDG target 6.4)	Number of cities applying and reporting on the Cities Biodiversity Index	Ratio of land consumption rate to population growth rate (indicator for SDG target 11.3)	*No specific indicators identified*
Goal 1: The education for sustainable development is integrated into all level education curricula and this information is disseminated by at least 5% of mass media.																
Goal 2: Establish the biodiversity sub-database through improving the content and access to the National Environmental Information Database and ensure its use in decision making.																
Goal 3: Create a legal environment for the protection, sustainable use, and fair and equitable sharing of benefits arising from widely used and economically significant genetic resources, and to implement sustainable use, and protection from genetic erosion and depletion.																
Goal 4: The national programs on conservation of rare and endangered animal and plant species is fully implemented.	4		4	3												
Goal 5: At least 30% of each representative of main ecosystems, all patch and vulnerable to climate change ecosystems are included in to the National Protected Area network and their management is improved.																
Goal 6: Protect soil and water resources from chemical and nutrient pollution.										3	4	4		3		
Goal 7: Increase forest cover to 9% by 2025 through the improvement of forest management, and thereby protect forest biodiversity.																
Goal 8: Introduce management techniques for the sustainable use and conservation of natural resources, especially game animal resources, by mean of utilizing the creation of partnerships between government, local citizens, and private sector.																
Goal 9: Taking into account grazing capacity and livestock population size, utilize legislative and economic leverages to reduce pasture degradation by up to 70% and increase quality of existing pastures.										3						

Goal																
Goal 10: Modernize industrial farming techniques and activities to meet requirements for food safety and conservation of biodiversity in the environment's agricultural ecosystem.																
Goal 11: The biodiversity related indicators are reflected in the national evaluation system to monitor the implementation of project and programmes of relevant sectors.																
Goal 12. Create a legal environment where subsidies or financial assistance are prohibited for use in agriculture, mineral resource extraction, infrastructure, energy, light industry, food manufacturing, and service industry projects and actions deemed to be harmful to or potentially harmful to biological diversity in accordance with environmental strategy evaluations.						2										
Goal 13: Taking into account the value and importance of pasture, water resources and forest ecosystem services, develop and implement a framework for sustainable use and conservation of natural resources in which social and economic benefits of these resources are appropriately protected.							2	4							1	
Goal 14: Identify potential sources of funding that are needed to implement the national biodiversity program and create a framework for efficient use of these funds.																

Aichi Targets	Target 5.												
Generic indicators	Trends in extent of forest				Trends in extent of natural habitats other than forest			Trends in fragmentation of forest and other natural habitats	Trends in degradation of forest and other natural habitats		Trends in extinction risk and populations of habitat specialist species in each major habitat type		
Specific Indicators/National Goals	Trends in tree cover	Forest area as a percentage of total land area (indicator for SDG target 15.1)	Proportion of important sites for terrestrial and freshwater biodiversity that are covered by protected areas, by ecosystem type (indicator for SDG target15.1)	Progress towards sustainable forest management (indicator for SDG target 15.2)	Change in the extent of water-related ecosystems over time (indicator for SDG target 6.6)	Natural habitat extent (land area minus urban and agriculture)	Wetland extent	No specific indicators identified	Biodiversity Habitat Index	Proportion of land that is degraded over total land area (indicator for SDG target 15.3)	Red List index (forest specialists)	Living Planet Index (forest specialists)	Species Habitat Index
Goal 1: The education for sustainable development is integrated into all level education curricula and this information is disseminated by at least 5% of mass media.													
Goal 2: Establish the biodiversity sub-database through improving the content and access to the National Environmental Information Database and ensure its use in decision making.													
Goal 3: Create a legal environment for the protection, sustainable use, and fair and equitable sharing of benefits arising from widely used and economically significant genetic resources, and to implement sustainable use, and protection from genetic erosion and depletion.													
Goal 4: The national programs on conservation of rare and endangered animal and plant species is fully implemented.											4		
Goal 5: At least 30% of each representative of main ecosystems, all patch and vulnerable to climate change ecosystems are included in to the National Protected Area network and their management is improved.			4										
Goal 6: Protect soil and water resources from chemical and nutrient pollution.					3	3							
Goal 7: Increase forest cover to 9% by 2025 through the improvement of forest management, and thereby protect forest biodiversity.	4	4		4									
Goal 8: Introduce management techniques for the sustainable use and conservation of natural resources, especially game animal resources, by mean of utilizing the creation of partnerships between government, local citizens, and private sector.													
Goal 9: Taking into account grazing capacity and livestock population size, utilize legislative and economic leverages to reduce pasture degradation by up to 70% and increase quality of existing pastures.										3			

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Aichi Targets	Target 6.																				
Generic indicators	Trends in certified sustainable fisheries	Trends in proportion of depleted, target and bycatch species with recovery plans	Trends in population and extinction risk in target and bycatch species									Trends in fishing practices							Trends in proportion of fish stocks outside safe biological limits	Trends in catch per unit effort	
Specific Indicators/National Goals	MSC certifiedcatch	Number of countries with regulations requiring recovery of depleted species	Proportion of depleted stocks with rebuilding plans in place	Red List Index (harvested aquaticspecies)	Number of countries with policies that make adequate provisions to minimize the impacts of fisheries on threatened species	Proportion of fisheries with regular monitoring and reporting ofimpacts on threatened species	Proportion of threatened species for which mortality rate due to fisheries is decreasing	Number of countries with policies to secure that mortalities are accounted for and kept within safe biological limits	Trends in population of non-target species affected by fisheries	Red List Index (impacts of fisheries)	Living Planet Index (trends in target and bycatch species)	Global effort in bottom trawling	Progress by countries in the degree of implementation of international instruments aiming to combat illegal, unreported and unregulated fishing (indicator for SDG target 14.6)	Amount (spatial extent, gear type, intensity) of fishing effort within vulnerable habitats	Number of countries with ecosystem impact monitoring and/or assessment programmes	Number of countries with legislation allowing for actions for the protection of vulnerable habitats (including VMEs), and addressing threats to ecosystem structure and function	Coverage of fisheries with management measures to effectively manage bycatch and reduce discards	Number and coverage of stocks with adaptive management systems / plans	Proportion of fish stocks within biologically sustainable levels (indicator for SDG target 14.4)	Estimated fisheries catch and fishing effort	Progress by countries in the degree of application of a legal/regulatory/policy/institutional framework which recognizes and protects access rights for small-scale fisheries (indicator for SDG target 14.b)
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Aichi Targets	Target 7.								
Generic indicators	Trends in proportion of area of agriculture under sustainable practices			Trends in extinction risk and populations of agro-ecosystem associated species	Trends in proportion of production of aquaculture under sustainable practices	Trends in proportion of area of forest production under sustainable practices			Trends in extinction risk and populations of forest-specialist species in production forest
Specific Indicators/National Goals	Areas of agricultural land under organic production	Areas of agricultural land under conservation agriculture	Proportion of agricultural area under productive and sustainable agriculture(indicator for SDG target 2.4)	Wild Bird Index for farmland birds / Living Planet Index (farmland specialists)	*No specific indicators identified*	Area of forest under sustainable management certification	Progress towards sustainable forest management(indicator for SDG target 15.2)	Wild Bird Index for specialist forest birds / Living Planet Index (forest specialists)	*No specific indicators identified*
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Aichi Targets	Target 8.															
Generic indicators	Trends in pollutants									Trends in extinction risk and populations driven by pollution	Trends in ecosystems affected by pollution	Trends in nutrient levels				
Specific Indicators/National Goals	Trends in emissions, NOX	Trends in emissions, SOX	Trends in emissions, POPs	Trends in mercury emissions	Trends in pesticide use	Index of Coastal Eutrophication (ICEP) and Floating Plastic debris Density (indicator for SDG target 14.1)	Mortality rate attributed to household and ambient air pollution(indicator for SDG target 3.9)	Mortality rate attributed to unsafe water, unsafe sanitation and lack of hygiene (exposure to unsafe WASH services) (indicator for SDG target3.9)	Mortality rate attributed to unintentional poisoning (indicator for SDG target3.9)	Red List Index (impacts of pollution)	Water Quality Index for Biodiversity	Trends in nitrogen deposition	Trends in loss of reactive nitrogen to the environment	Trends in global surplus of nitrogen	Proportion of bodies of water with good ambient water quality(indicator for SDG target 6.3)	Percentage of wastewater safely treated (indicator for SDG target 6.3)
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Aichi Targets	Target 9.							Target 10.								
Generic indicators	Trends in identification and prioritization of invasive alien species	Trends in the distribution and populations of invasive alien species	Trends in eradication of priority invasive alien species	Trends in extinction risk and populations driven by invasive alien species	Trends in impacts of invasive alien species on ecosystems	Trends in the numbers of invasive alien species introduction and establishment	Trends in implementation of policy responses preventing the introduction and establishment of invasive alien	Trends in extent and condition of coral reefs	Trends in extinction risk and populations of coral and coral-reef	Trends in pressures on coral reefs	Trends in responses to reduce pressures on coral reefs	Trends in extent and condition of other vulnerable ecosystems impacted	Trends in species extinction risk and populations or condition of other vulnerable ecosystems impacted by climate		Trends in pressures on other vulnerable ecosystems impacted by climate	Trends in responses to reduce pressures on other vulnerable ecosystems
Specific Indicators/National Goals	No specific indicators identified	No specific indicators identified	Trends in invasive alien species vertebrate eradications	Red List Index (impacts of invasive alien species)	No specific indicators identified	Trends in the numbers of invasive alien species introduction events	Proportion of countries adopting relevant national legislation and adequately resourcing the prevention or control of invasive alien species (indicator for SDG target 15.8)	Trends in proportion of live coral cover	Red List Index (reef-building coral species)	Average marine acidity (pH) measured at agreed suite of representative sampling stations (indicator for SDG target 14.3)	No specific indicators identified	No specific indicators identified	Climatic Impact Index for birds	Red List Index (impacts of climate change)	No specific indicators identified	No specific indicators identified
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Aichi Targets	Target 11.													
Generic indicators	Trends in area of terrestrial and inland water areas conserved				Trends in area of coastal and marine areas conserved		Trends in areas of particular importance for biodiversity conserved	Trends in areas of particular importance for ecosystem services conserved	Trends in ecological representativeness of areas conserved			Trends in effectiveness and/or equitability of management of conserved areas		Trends in connectivity and integration of conserved areas
Specific Indicators/National Goals	Percentage of terrestrial and inland water areas covered by protected areas	Percentage of terrestrial and inland water areas and or marine and coastal areas covered by other effective area-based conservation measures	Number and extent of important sites for biodiversity that are covered by other effective area-based conservation measures	Trends in the appropriate recognition of other effective area-based conservation measures areas and appropriate support provided to them	Percentage of marine and coastal areas covered by protected areas	Coverage of protected areas in relation to marine areas (indicator for SDG target 14.5)	Protected area coverage of Key Biodiversity Areas (including Important Bird and Biodiversity Areas, Alliance for Zero Extinction sites)	No specific indicators identified	Protected area coverage of terrestrial and marine ecoregions	Species Protection Index	Protected Area Representativeness Index	Protected area management effectiveness	The Wildlife Picture Index (disaggregated by protected area)	Protected Area Connectedness Index
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Aichi Targets	Target 12.								Target 13.										
Generic indicators	Trends in number of extinctions	Trends in extinctions prevented	Trends in extinction risk and populations of species						Trends in genetic diversity of cultivated plants				Trends in genetic diversity of farmed and domesticated animals	Trends in extinction risk and populations of wild relatives			Trends in protected area coverage of wild relatives (to be...)	Trends in genetic diversity of socio-economically as well as...	Trends in development and implementation of strategies for minimizing genetic erosion and safeguarding genetic diversity
Specific Indicators/National Goals	Number of species extinctions	Number of extinctions prevented by conservation action	Red List Index (indicator for SDG target 15.5)	Living Planet Index	Species Protection Index for species in decline	Local Biodiversity Intactness Index	Wild Bird Index	Wildlife Picture Index	Number of plant and animal genetic resources for food and agriculture secured in either medium- or long-term conservation facilities (indicator for SDG target 2.5)	Number of plant genetic resource for food and agriculture surveyed/inventoried	Percentage of plant genetic resources for food and agriculture threatened out of those surveyed/inventoried	Number of Standard Material Transfer Agreements, as communicated to the Governing Body of the International Treaty on Plant Genetic Resources for Food and Agriculture	Proportion of local breeds, classified as being at risk, not-at-risk or unknown level of risk of extinction (indicator for SDG target 2.5)	Red List Index (wild relatives)	Species Habitat Index (wild relatives)	Species Protection Index (wild relatives)	No specific indicators identified		Level of implementation of global plan of actions on genetic resources for food and agriculture
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Aichi Targets	Target 14.											Target 15.			Target 16.	
Generic indicators	Trends in safeguarded ecosystems that provide essential services	Trends in extinction risk and populations of species that provide essential services			Trends in benefitsfrom ecosystem services				Trends in restoration of ecosystems that provide essential	Trends in the degree to which ecosystem services provides for the needs of women, indigenous and local communities, and the poor and		Trends in ecosystem resilience	Trends in carbon stocks within ecosystems		Trends in the implementation of the Nagoya Protocol	
Specific Indicators/National Goals	*No specific indicators identified*	Red List Index (species used for food and medicine; pollinating species)	Living Planet Index (utilized species)	Species Habitat Index (species that provide essential services)	Better Life Index	Mountain Green Cover Index (indicator for SDG target15.4)	Coverage by protected areas of important sites for mountain biodiversity (indicator for SDG target 15.4)	Ocean Health Index	*No specific indicators identified*	Prevalence of moderate or severe foodinsecurity in the population, based on the FoodInsecurity Experience Scale (FIES)	Percentage of population using safely managed drinking water services (indicator for SDG target6.1)	*No specific indicators identified*	Trends in forest carbon stocks	Global Ecosystem Restoration Index	Number of Parties to the CBD that have deposited the instrument of ratification, acceptance, approval or accession of the Nagoya Protocol	Number of countries that have adopted legislative, administrative and policy frameworks for the implementation of the Nagoya Protocol (SDG indicator15.6)
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Aichi Targets	Target 17.		Target 18.					Target 19.				Target 20.	
Generic indicators	Trends in development, adoption and implementation of national biodiversity strategies and action plans, as policy instruments		Trends in land-use change and land tenure in the traditional territories of indigenous and local communities (decision X/43)		Trends in the practice of traditional occupations (decision X/43)	Trends in which traditional knowledge and practices are respected through their full integration,	Trends of linguistic diversity and numbers of speakers of indigenous languages (decision VII/30	Number of maintained species inventories being used to implement the Convention				Trends in the mobilization of financial resources	
Specific Indicators/National Goals	Number of countries with developed or revised NBSAPs	Number of countries with NBSAPs adopted as policy instruments	(a) Proportion of total agricultural population with ownership or secure rights over agricultural land, by sex; and (b) share of women among owners or rights-bearers of agricultural land, by type of tenure(indicator for SDG target 5.a)	Proportion of total adult population with secure tenure rights to land, with legally recognized documentation and who perceive their rights to land as secure, by sex and by type of tenure (indicator for SDG target 1.4)	No specific indicators identified	Number of local community-based monitoring on traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity	Index of Linguistic Diversity	Species represented in the barcode of life data system	Growth in species occurrence records accessible through GBIF	Species Status Information Index	Proportion of known species assessed through the IUCN Red List	Information provided through the financial reporting framework, adopted by decision XII/3 (https://chm.cbd.int/search/financial-reporting)	Official development assistance and public expenditure on conservation and sustainable use of biodiversity and ecosystems (indicator for SDG target 15.a and 15.b)
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