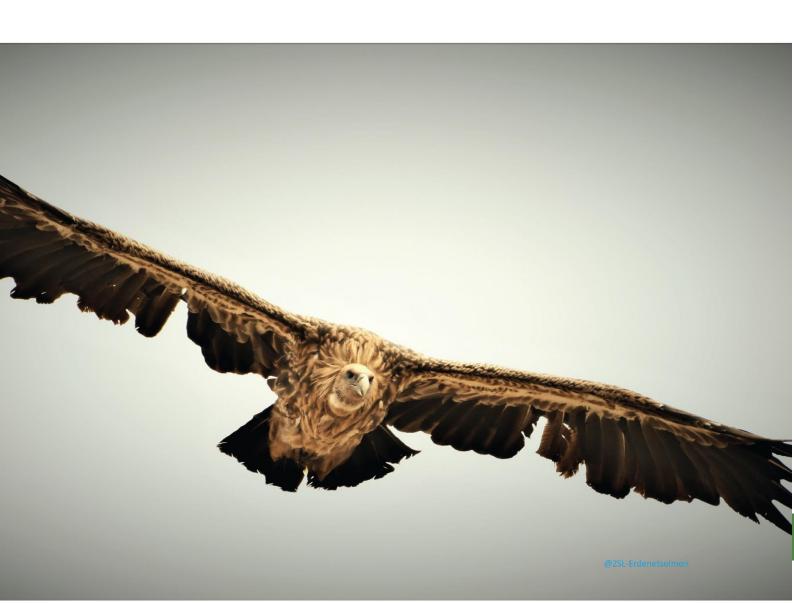# "CONSERVING FOREST STEPPE ECOSYSTEM AND ENDANGERED SPECIES THROUGH LOCAL COMMUNITY-LED NETWORK" PROJECT

ENDLINE STUDY REPORT

Content

Abbreviation

BMI	Body Mass Index
FUG	Forest User Group
LPA	Local Protected Areas
IRIM	Independent Research Institute of Mongolia
MPI	Multidimensional Poverty Index
PUG	Pasture User Group
PWD	Person with Disability
ZSL	The Zoological Society of London

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Acknowledgement

Background

Independent Research Institute (IRIM) undertook an Endline Study of the Zoological Society of London (ZSL) funded project "**Conserving Forest Steppe Ecosystems and Endangered Species through Community-led Network**" between January 15 and March 26, 2021.

The study aims to evaluate the outcomes of the ZSL-funded project with objectives of establishing standard management of local protected areas through conserving, using and restoring natural resources with the participation of a local community-led network in Khoid Mogoin Gol-Teel Local Protected Area (LPA) of Bulgan soum, Arkhangai aimag.

Under the study, **firstly,** the socio-economic situations of the residents along Teel LPA were studied and findings of the study were compared with the Baseline Study conducted at the beginning of the project in 2018[1] as well as the livelihoods at national, regional and local levels. In other words, the socio-economic situations of the project beneficiaries were studied with the Multi-dimensional Poverty Index (MPI), which is designed to measure basic socio-economic situations. **Secondly,** the implementation and effectiveness of each project activity was evaluated against the target outcome indicators set out in the Project Log-frame. **Thirdly,** the project beneficiaries' opinions and attitudes toward conserving natural resources with the participation of the local network were collected.

The survey covered 150 households out of 881 households[2] from Bulgan soum, Arkhangai aimag, and collected primary data with a questionnaire containing 53 questions allocated in 6 sections. Of the 150 households surveyed, 134 were community members and the rest were non-community members. In addition, semi-structured interviews were carried out with key stakeholders such as local people, local authorities, and nature reservationist to collect primary qualitative data. A total of 18 interviews were conducted with these stakeholders.

The study report comprises of the chapters, including (i) study methodologies, (ii) socio-economic situations of the residents along Teel LPA, (iii) evaluation results of the project outcome and implementation, and (iv) the beneficiaries' opinions and attitudes towards the local community-led environmental conservation (v) General Conclusions.

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[1] Independent Research Institute of Mongolia, Septermber 2018 – February 2019
[2] NSO, Integrated Database, 2020

EXECUTIVE SUMMARY

This report outlines the results and findings of a socio-economic study and general trends with the special focus of the study being on the status of endangered species, forest management, sustainable pasture management, sources of incomes of the local people along the LPA, and the effectiveness of the LPA management and conservation system. The report summarizes the detailed findings of the socio-economic situations of the local population, such as living standards, education and health, as well as the current state of local natural resources, participation in decision-making as well as opinions and attitudes of beneficiaries toward community-led environmental conservation.

Both quantitative and qualitative data collection methods were employed to validate and cross check the study findings, present the stakeholders' opinions equally, and evaluate the project impact. To ensure comparability of the quantitative data with the Baseline Study findings, the MPI method was used.

The key findings of the study are as follows:

- In terms of age, the youngest respondent is 22, the oldest is 66. On average, 74% of the respondents (41) are aged between 30-49. In addition, half (75 out of 150) respondents are female, and the other half are male. In terms of household size, there was one single-headed household, while the largest household had eight members. The number of the household members vary from 4 to 5 with 2-3 children. The heads of the households are most likely to be a main income earner, living in the area for 30 years. In terms of the ethnicity groups, 95.8% of the respondents are Khalkh, and the remaining 4.2% are Uuld, Khoton and Darkhad.

- Comparing to the Baseline Study, the MPI decreased (by 0.031) from 0.115 to 0.084 during the Endline Study. In other words, the proportion of the poor in the total population, decreased from 29.7% to 22.9%. The intensity of multidimensional poverty decreased (by 0.024) from 0.389 to 0.365. This means that 38.9 percent of households affected by deprivation during the Baseline Study dropped to 36.5 percent. As a result, both sub-indices declined to some extent, contributing to the decline in the MPI.

- Taking into account the changes in the socio-economic situations of the residents along the LPA, the MPI decreased from 0.115 during the Baseline Study to 0.084 during the Endline Study. The decrease in the MPI indicates an improvement in the socio-economic situations of the local population. Since the livelihoods of partnership members are higher than those of non-partnership members who are not involved in the project, it can be concluded that the project has made a significant contribution to improving the livelihoods of households.

- As a result of the project, population numbers of endangered species in the LPA is expected to increase over the last 3 years. In particular, the population of deer and marmots has increased significantly. The increase in population numbers of endangered species is explained by improved community surveillance, camera surveillance, prevention of illegal logging, reduced poaching, and improved regulations. It is also pertaining to the environmental awareness training and advocacy activities organized within the project.

- It was said by the respondents that the entire forest was at risk prior to the project implementation. This is due to the fact that the local people were harvesting firewood illegally from the LPA. However, following the project, the situation improved significantly as the partnerships began to operate, closing off logging paths leading to the forest, improving surveillance and monitoring, and
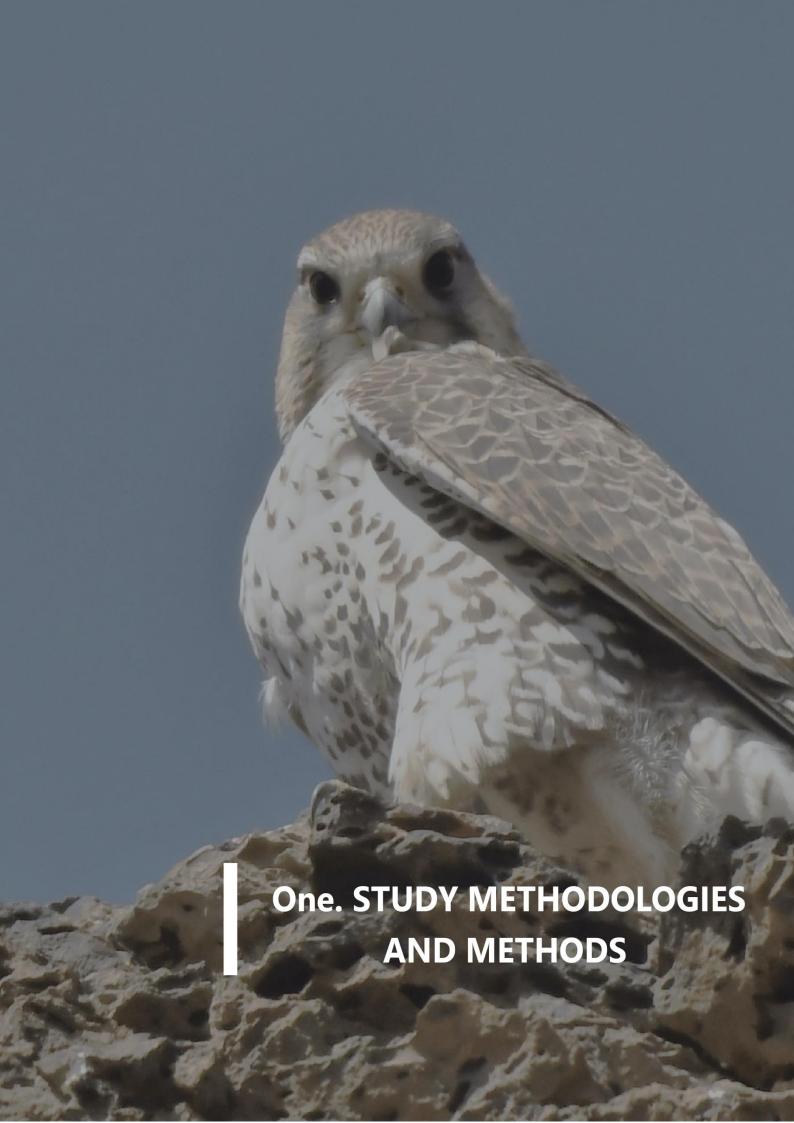
sending active patrols. Moreover, the community was given the opportunity to remove dead trees from the forest and contribute to their incomes while monitoring the local logging activities. Thus, illegal logging has decreased.

- Respondents noted that pasture conditions have continued to deteriorate over the past three years, despite the implementation of the project. Herders attribute the deterioration of pasture conditions to an increase in the number of livestock, climate change, and the spring and summer droughts of the past two years. In other words, it is not possible for the project and herders to manage climate change. To improve the pasture conditions, the local people are taking measures such as rotating pastures, fencing hayfields, and saving winter camps in autumn and spring for winter times. It was also noted there is an urgent need for the local people to work together to improve the quality of livestock, reduce the total number of livestock and control the number of migrating herders from other soums as well as herders in the aimag center. Therefore, it can be seen that the local people now have increased awareness of the pasture conditions and share the same solutions to these issues.

- The local people said that the households with membership in the partnerships were able to increase their income streams. The key factors include income earned from dead tree removal activities and the Joint Savings Fund. Provision of dead tree removal equipment, establishment of community partnerships and facility support for small and medium businesses has seen the desired results, which is increased household income diversification. The partnership leaders started using the equipment in the activities, namely processing dairy products and harvesting. The Joint Savings Fund also contributes to the household livelihoods. With the increased capacity of the equipment, the local people are able to increase their income from the removal of dead trees and the production of dairy products. The civil servants also agreed that all partnerships had multiple sources of income, such as from production of dairy products, and from constructing fly ash clay brick fences for cattle and logging.

- Stakeholders emphasize that the establishment of community-led network management in the LPA is "very effective". The establishment of a community-led network in the LPA has brought out positive changes; the project team and the local community have established good cooperation. However, cooperation of the local people with the local authorities and official has remained stagnant.

- As a part of the study, opinions and attitudes of project beneficiaries toward the local community-led conservation were investigated. The vast majority of beneficiaries believe that hunting should be regulated and activities to protect the global endangered species should be initiated.

- 81.3% of all households agree that it is important to regulate the use of natural resources through rules and regulations, and 95.3% of all households agree that the participation of every citizen is crucial to stop illegal logging and exploitation of the natural resources. It can be concluded that the local people are supportive in raising awareness of the importance and benefits of establishing the local community-led forest management.

- 90.6% of households agreed the importance of environmental protection for the establishment of a sustainable pasture management in the LPA, while no household consider it as insignificant. 78.7% of the respondents said that pasture use should be regulated through the activities, rules and regulations of partnerships and associations. The majority of the respondents are seen to acknowledge the importance of creating LPA with sustainable pasture management.

- Approximately 3 out of 4 people said that it is important to implement projects and programs aimed at using natural resources wisely, protecting traditions and culture, and improving the social and economic situation of herders and the local population. Most of the respondents (87.4%) agree that herders and partnership members now have multiple streams of income. In addition, 75.3% of the respondents agree that it is important to support community cooperation and establish partnerships. The households with a membership in the partnership are more likely to have higher appreciation than non-partnership member households.
- 98% of the respondents say that it is important for citizens (forest communities, pasture use groups (PUG) and local authorities, department of environment, forest user groups (FUG), agencies of the land administration, police, and specialized inspection divisions) to work together to conserve forest-steppe ecosystems through the local community-led network. All of the stakeholders fully agree that the introduction of the effective conservation management in the LPA is vital.

One. STUDY METHODOLOGIES AND METHODS

One. STUDY METHODOLOGIES AND METHODS

The Study Aim

The study aims to evaluate the outcomes of the ZSL-funded project, implemented between July 2018 and March 2021, with objectives of establishing standard management of the local protected areas through the conservation, rational use and restoration of natural resources with the participation of a local community-led network in Khoid Mogoin Gol-Teel Local Protected Area (LPA) of Bulgan soum, Arkhangai aimag.

Under the objectives of the study, the research team undertook the following activities (i) analyzing the socio-economic situations of the residents along Gol-Teel LPA, (ii) evaluating the impact on biodiversity in the Khoid Mogoin Gol-Teel areas, and (3) studying opinions and attitude toward environmental conservation, sustainable development and rational, equitable and inclusive use of the natural resources.

The Baseline Study findings are compared against those of the Endline Study in terms of the changes in the livelihoods of the beneficiaries and socio-economic situations of the local people and environmental conditions. The study covered the target vulnerable communities of the project and looked at gender issues.

Scope of the study

Figure 1 shows how the goals and activities of the ZSL project are in line with the UN Sustainable Development Goals (SDGs) 2030 and the AICHI 20 Biodiversity Convention.

The main focus of the project activities was placed on introducing effective conservation management in the LPA through establishing effective community-led forest and pastureland management, protecting and monitoring wildlife and endangered species, introducing effective conservation management in the LPA, and supporting the citizens and communities to diversify their income. The project activities-protecting terrestrial ecosystem, reducing the impacts of climate change, ensuring gender equality, supporting livelihoods of the local population, ending poverty and hunger through promoting job security, and strengthening the partnership for economic growth in Bulgan soum, Arkhangai aimag- are closely harmonized with objectives 1, 2, 5, 7, 11, 12, 14, 17, 18 of AICHI 20 Biodiversity Convention and Goal 1, Goal 2, Goal 5, Goal 8, Goal 13, Goal 15 and Goal 17 of the SDG 2030 shown in Figure 1 with light blue and pink background respectively.
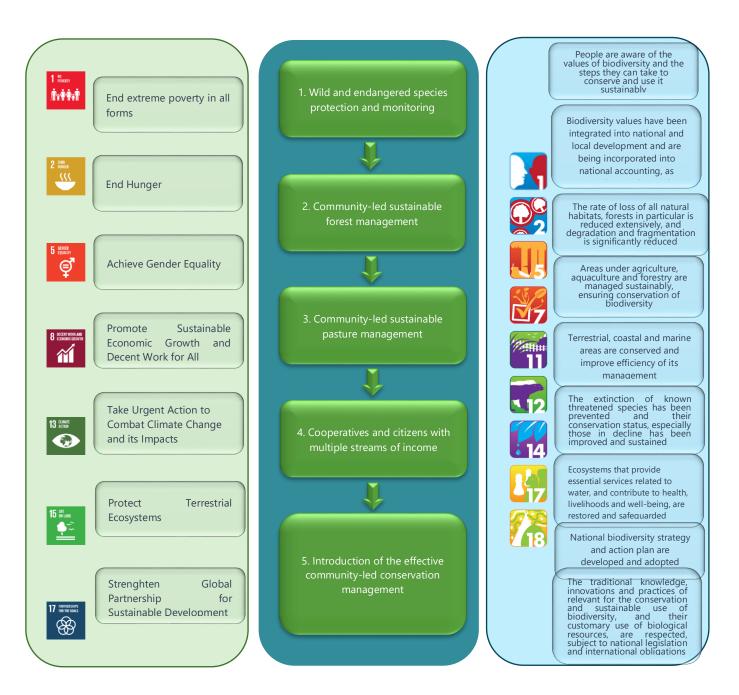
Based on the data collected from the residents along Teel LPA, the socio-economic situations and environmental impact of the project were studied against the indicators set forth in the Project Log-frame and below shown document objectives.

Figure 1. Harmonization of the SDGs 2030, outputs of the ZSL project and AICHI- 20 goals

SUSTAINABLE DEVELOPMENT GOALS ⟷ **ZSL | LET'S WORK FOR WILDLIFE** ⟷ **Convention on Biological Diversity**

SDGs	ZSL project outputs	Aichi Biodiversity Targets
End extreme poverty in all forms	1. Wild and endangered species protection and monitoring	People are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably
End Hunger	2. Community-led sustainable forest management	Biodiversity values have been integrated into national and local development and are being incorporated into national accounting, as
Achieve Gender Equality	3. Community-led sustainable pasture management	The rate of loss of all natural habitats, forests in particular is reduced extensively, and degradation and fragmentation is significantly reduced
Promote Sustainable Economic Growth and Decent Work for All		Areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity
Take Urgent Action to Combat Climate Change and its Impacts	4. Cooperatives and citizens with multiple streams of income	Terrestrial, coastal and marine areas are conserved and improve efficiency of its management
		The extinction of known threatened species has been prevented and their conservation status, especially those in decline has been improved and sustained
Protect Terrestrial Ecosystems	5. Introduction of the effective community-led conservation management	Ecosystems that provide essential services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded
Strenghten Global Partnership for Sustainable Development		National biodiversity strategy and action plan are developed and adopted
		The traditional knowledge, innovations and practices of relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and international obligations

Source: (Monica Wrobel, Tungalag Ulambayar, Samuel Merson, Erdenetsolmon Ganbaatar, Khaliun Tsog, 2020)
 (United Nations, Sustainable Development Goals, 2015-2030)
(Aichi Biodiversity Targets, 2020)

Study methodologies

The general framework of the study methodology is shown in Figure 2. The study has three objectives. The first objective of the study is to assess the socio-economic situations of the residents along Teel LPA and compare the findings with the Baseline Study conducted at the beginning of the project in 2018[3] as well as the livelihoods at national, regional and local levels. This objective was more in line with the SDGs, ending poverty and hunger and creating economic growth through gender equality and the promotion of decent work. The same methodologies were employed in the Baseline Study and Endline Study to ensure the comparability of the findings. The MPI, designed to measure basic socio-economic situations, was employed to quantify the socio-economic situations of the project beneficiaries. The MPI is an index designed to measure the depth of poverty by combining two main data, including (i) the incidence of poverty in the given population, or the proportion of people affected by multidimensional poverty, and (ii) the intensity of their deprivation, or the weighted average ratio of deprivation. The methodology for calculating this index is described in detail in section "Some Socio-Economic Indicators of the Household and Their Changes" in the report.

In contrast to the Baseline Study, in the Endline Study, a Multiple Regression Analysis was performed to determine the factors influencing the MPI. This way, it made possible to determine whether the socio-economic situations of the households are dependent on the education, age and membership head of the household. In addition, a desk review was conducted to compare the situation of the project beneficiaries with non-beneficiary local communities.

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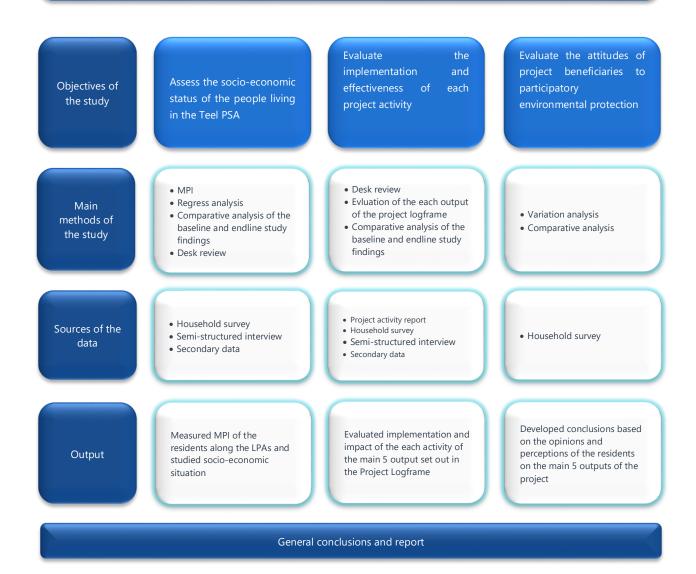
[3] Independent Research Institute of Mongolia, September 2018 – February 2019

Figure 2. Study design

Objectives of the study: The purpose of this study is to evaluate the final results of the project implemented by LASH in Teelin SPA, Bulgan soum, Arkhangai aimag, with the aim of establishing standard local protected area management through participatory protection, sustainable use and rehabilitation of natural resources.

Objectives of the study	Assess the socio-economic status of the people living in the Teel PSA	Evaluate the implementation and effectiveness of each project activity	Evaluate the attitudes of project beneficiaries to participatory environmental protection
Main methods of the study	• MPI • Regress analysis • Comparative analysis of the baseline and endline study findings • Desk review	• Desk review • Evluation of the each output of the project logframe • Comparative analysis of the baseline and endline study findings	• Variation analysis • Comparative analysis
Sources of the data	• Household survey • Semi-structured interview • Secondary data	• Project activity report • Household survey • Semi-structured interview • Secondary data	• Household survey
Output	Measured MPI of the residents along the LPAs and studied socio-economic situation	Evaluated implementation and impact of the each activity of the main 5 output set out in the Project Logframe	Developed conclusions based on the opinions and perceptions of the residents on the main 5 outputs of the project

General conclusions and report

The second objective of the study was to evaluate the implementation and effectiveness of each project activity against the target outcome set out in the Project Log-frame. Under the objective, the research team reviewed the project documents and related materials and evaluated the project activities related to 5 objectives with 21 indicators, in which both quantitative and qualitative data research methodologies were employed. The findings were compared to the Baseline Study results.

The third objective was to survey the project beneficiaries' opinions and attitude toward conserving natural resources with the participation of the local network. To achieve the objective, using a questionnaire, the study team surveyed 150 households, on the data of which simple statistical analysis, comparative analysis, and variance analysis were performed.

Data sources

The study team used primary and secondary quantitative and qualitative data. Figure 2 depicts the data used for each objective of the study.

Primary data

With a questionnaire containing 53 questions allocated in 6 sections, primary data was collected from 150 households out of 881 households[4] in Bulgan soum, Arkhangai aimag. Of the 150 households surveyed, 134 were community members and the rest were non-community members.

Primary qualitative data

To collect primary and secondary qualitative data, semi-structured interviews were carried out with key stakeholders. They included beneficiaries, partnership members, local authorities and nature reservationist. Shown in the table below, a total of 18 interviews were conducted.

Table 1. Primary qualitative data, by groups

№	Group	No. of interviews
1	Executive chief of partnership association	1
2	Partnership leader	6
3	Head of the single male headed-household	1
4	Civil servant/officials	5
5	Active patrols and nature preservationist	5

Sex balance of the respondents was sought during the quantitative data collection from the target groups. One male-headed household was interviewed. However, no female-headed household was covered in the survey.

The civil servant groups shown in Table 1 included soum governors, soum deputy governors, bagh governors, state environmental inspectors, and ecological policemen.

Quantitative and secondary data

Apart from the quantitative and qualitative primary data, desk review was conducted on the following documents to evaluate the final results of the project. They include;

- Annual and semi-annual reports on project activities
- Khoid Mogoin Gol - Teel LPA Management Plan, 2018-2023
- Baseline Socio-economic Study of the residents along the LPA, 2018
- The Project Log-frame for Evaluating and Monitoring Project Performance
- Socio-economic statistics of Mongolia and relevant reports

Limitations of the study

In January 2020, the COVID-19 pandemic broke out globally and Mongolia started imposing a partial or total quarantine. During this period, active social and economic activities came to a standstill, keeping the project implementation stagnant. The period of the Endline Study was unique in a sense that it was conducted during a strict lockdown to prevent COVID-19. Quantitative and qualitative information was collected by telephone as the research team was no longer to visit the field in Arkhangai aimag. In addition, the project team met and worked online.

As mentioned before, the field visit to meet with the project beneficiaries and assess the situations was restricted during the End-line Study. The study team faced some challenges during the telephone data collection while making effort to ensure accuracy and reliability of the data.

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[4] NSO Integrated Database, 2020

Two. SOCIO-ECONOMIC STUDY OF RESIDENTS ALONG TEEL LOCAL PROTECTED AREAS

Two. SOCIO-ECONOMIC STUDY OF RESIDENTS ALONG TEEL LOCAL PROTECTED AREAS

This part of the report summarizes that the ZSL project-brought changes to the socio-economic situations of the residents along Teel LPA, Bulgan soum, Arkhangai aimag since the second half of 2018.

Desk review was conducted apart from the MPI calculation on 150 households and qualitative data from the semi-structured interviews with key project stakeholders. The Baseline Study findings and results were compared with those of the Endline Study.

Household demographics

Demographics of the respondents are useful to identify the characteristics of the project beneficiaries and related results. This part of the report presents the demographics of 150 out of 881 households[5] in Bulgan soum, Arkhangai aimag.

Preferably, the heads of the households were invited to the survey to ensure completeness and accuracy of the data. 77 of the respondents were the heads of the households and the remaining 73 were their spouses. In addition, exactly 50% of the 150 respondents were women and the remaining 75 were men. This means gender balance of the respondents was ensured.

In terms of age, the youngest respondent was 22 and the eldest one was 66. An average age of the respondents was 41. Figure 3 shows the age groups of the respondents using the National Statistical Office (NSO) methodology. 74.0% of the respondents, or three out of four respondents are aged between 30 and 49. The respondents aged 20-29 were relatively fewer, which accounted for 10.7% of the sample. Elderly people over 50 accounted for 15.3% of the respondents.

Figure 3. Age groups, n=150

Figure 4. Marital status, by gender, n=150
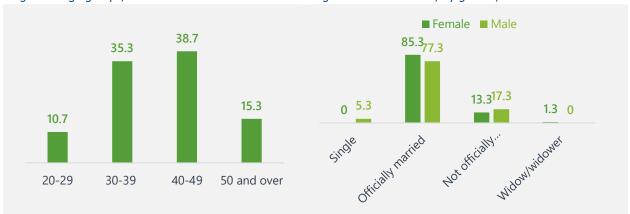
Figure 4 shows marital status of the respondents by gender to show attributed differences. No unmarried women or widows were included in the survey. 5.3% of all the male respondents (75) were unmarried. Therefore, women are more likely to get married, while men are less likely to get married.

In terms of household size, there was one single-headed household, while the largest household had eight members. On average, the number of the household members vary from 4 to 5 with 2-3 children. The heads of the households are most likely to be the main income earner residing in the area for 30 years. In terms of the ethnicity groups, 95.8% of the respondents are Khalkh, and the remaining 4.2% are Uuld, Khoton and Darkhad. The ethnic groups, namely Durvud, Kazakh and Buriad were not covered in the survey.

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[5] NSO, Integrated Databse, 2020

The majority of 660 respondents, or 74.2% are Buddhists. 22.5% of them are atheist while the remaining 3.3% are shaman, Christian and Islamic.

Most households migrate seasonally throughout the year. 106 out of 150 households (70.7%) migrated once each season of the year. 13.3% migrated eight times a year and 3.8% did twelve or more times a year. In addition, 56% of all households have migrated in the previous 12 months. 12.2% of all households have been sedentary.

Table 2 shows the number and proportion of vulnerable household members covered in the Baseline Study and Endline Study of the project. Of the 590 members of the 150 surveyed households, the Baseline Study covered 4 orphans and 19 widows/widowers, whereas the Endline Study covered one orphan and six widows/widowers. However, compared to the Baseline Study, there was an increased number of persons with disability (PWD) and increased mortality rate among children under 5 during the Endline Study. In total, the number of people from the vulnerable groups increased from 34 in the Baseline Study period to 38 in the Endline Study period. However, due to the high number of household members covered in the Endline Study, the proportion of vulnerable people in the total respondents seem to be in decline.

Table 2. Proportion of the vulnerable group people in the total sample population

№	Vulnerable group	Baseline, n=590		Endline, n=660	
		No. of vulnerable person	Percent	No. of vulnerable person	Proportion
1	Orphan	4	0.68	1	0.15%
2	Widow/widower	19	3.22	6	0.91%
3	Person with disability	11	1.86	21	3.18%
4	Mortality of children under 5	0	-	10	-
	Total	34	5.75	38	4.24%

Educational attainment of the household members

The part of the report presents the educational attainment of household members comparing with the Baseline Study.

The educational attainment of the respondents was relatively low. FigureFigure 5 shows that only 6% of the respondents had a bachelor's degree or higher, and the remaining 94.0% had a non-bachelor's degree, technical or vocational education, or lower. For instance, 25 out of 150 citizens (16.7%) had complete secondary education, 87 respondents (58.0%) had primary education, 22 respondents (14.7%) had primary education, and 2 respondents (1.3%) were uneducated.

Figure 5. Educational attainment, by percentage n=150

Figure 6 shows educational attainment of the respondents by gender. The educational attainment of the respondents was relatively low, the educational attainment of the male respondents in particular was

significantly lower than female counterparts. It was common that they were uneducated or had primary or lower secondary education. Conversely, Figure 6 shows that women are slightly more educated than men.

In the Endline Study, 44 households with uneducated adult members having primary or lower education (5th grade and lower) were surveyed. Making up 29.3% of the total households, this number indicates that the adult members of the households were relatively lower educated while it was 28% in the Baseline Study. There were 2 households with drop out children aged between 6 and 14, which was relatively fewer than those identified during the Baseline Study.

The household members' state of health

In the Baseline Study, 78% of the respondents were paying health insurance contribution while the percentage grew to 98% during the period of the Endline Study.

Height and weight data of household members were collected from each household and the body mass index (BMI) was calculated. The same methodology was used in the Endline Study as the BMI could illustrate the household food security and nutritional status in the Baseline Study. With the MPI, overweighted adults and children are not considered to be malnourished. Adults with a BMI below 18.5 are considered. FigureFigure 7 shows the respondents' state of health by BMI.
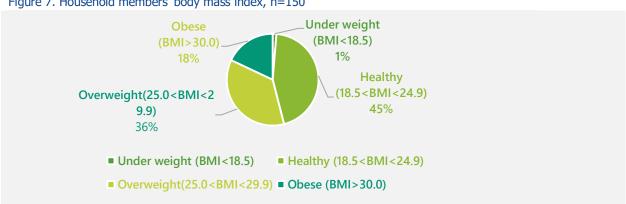
Figure 7. Household members' body mass index, n=150

According to the BMI, 54% of the respondents were overweight or obese. Also 45% of the respondents are healthy, which is higher compared to the 13% in the Baseline Study. In addition, 3% of the respondents were underweight, or malnourished during the Baseline Study while it was 1% during the Endline Study.

Household livelihood

The MPI considers six indicators for standards of living. Three of them pertain to factors that affect women's health and living standards, such as the accessibility to clean drinking water, improved sanitation, and clean fuel consumption. The two indicators are related to the quality of the housing at a basic level, which includes electricity and power supply, and the availability of floor materials. The last indicator is related to consumer goods (Alkire Sabina, et al., 2011), which can be counted as asset such as radios, video, telephones, bicycles, motorcycles, cars and trucks, and refrigerators.

Drinking water. In terms of access to safe drinking water, it is considered a shortage of clean drinking water if it is not available and 30 minutes away from home to get clean water. Clean drinking water includes tap water, taps, boreholes, pumps, protected wells, protected springs, and rainwater. According to the threshold, 3% used clean water, but according to the Endline Study, 34.7% have access to clean water. In other words, 34.7% of the total 150 households had access to clean water, and the remaining 65.3% were considered to have poor access to drinking water in terms of the living standard indicator.

Hygienity. If a household does not have access to adequate sanitation or sharing toilet, it is considered a lack of improved sanitation. Eligible sanitation facilities include latrines and walk-in toilets, as well as improved pit latrines without shared ventilation. In addition, if a household is dissatisfied with their situation, it is considered a lack of sanitation. According to the threshold, only 5% of households used improved sanitation in the Baseline Study while 60% used it in the Endline Study. In particular, 40% of households in the Endline Study are in need of sanitation in terms of living standards.

Clean fuel: If a household burns wood, coal or dung, there is a shortage of clean fuel. 99% of households in the Baseline Study and 98% of households in the Endline Study had a shortage of clean fuel in terms of living standards.

Floors of the accommodations (Ger and apartment): The majority of households (85%) had a ger, 2% had a fence house, and 13% had a ger or a house. The main material of the walls of the house and ger was wood, and the floor was waterproof linoleum. One-fifth of households (21%) had no floor or compacted dirt or dung floor. As a result, 21% of households are deprived in terms of a basic living standard indicator.

However, in the Endline Study, 90% of the households lived in gers, 8% in houses, and 2% in apartments. 4% of them rated the condition of their accommodations as excellent, 31.33% as good, 62.0% as optimal, and 2.67% as bad.

Electricity: In the Endline Study, all but one household had electricity. 11.3% of them used centralized power systems, 1.3% used diesel stations and gasoline generators, 70.7% used solar energy, 16.0% used small power generators and 0.7% used candles. This shows that in the Baseline Study, two households were deprived in terms of the electricity of the living standard indicator, while in the Endline Study, only one household was deprived of electricity.

Asset Ownership: A household is considered to be deprived if it does not own at least one or more radio, video, telephone, bicycle, motorcycle, refrigerator, washing machine, silver bowl, or greenhouse (without a car or tractor). Most households owned more than one asset. Most owned assets include a cell phone, a TV and a refrigerator. In addition, 58.7% of households own a vehicle, 41.3% own a car, and the majority or 70% own a motorcycle.

Household socio-economic indicators and its changes

Socio-economic situations of the households were studied and presented by (i) the compared MPI results (ii) analysis of the data collected from the key stakeholders with household questionnaires and interviews.

The MPI during the Baseline Study and the Endline Study

As part of the Endline Study, the MPI was calculated for 150 household data. The index is calculated according to the methodology of education (years of schooling, school of attendance), health (child mortality, nutrition), living standards (electricity, drinking water, sanitation, flooring, cooking fuel and asset ownership). 3 groups and 10 sub-indicators (asset ownership) were coded to 0 and 1 based on the relevant questions of the sample questionnaire, and in many respects, the deprivation score was used to determine whether the household was affected by poverty. For each of the 10 sub-indicators, the score is 0, 1 for the year of schooling, 1 for the household member with no primary education or 5 years of education, 1 for the school of attendance if the household has 6–14-year-old school dropouts, and 1 for less than 5 If there is a child mortality that happened at the same age, a score of 1 is given. A score of 1 on any of these 10 sub-indicators means that the household is in deprivation.

The table below shows the results of the deprivation score for the 150 households, the number of households that received 1 point for each of the 10 sub-indicators. For example, the Endline Study shows that 44 households had a member with no primary education.

Table 3. Households in deprivation

Indicators	No. of households in poverty		Proportion	
	Baseline	Endline	Baseline	Endline
Education				
No. of years of schooling	42	44	28%	29.3%
School of attendance	5	2	3%	1.3%
Health				
Child mortality	0	7	0%	4.7%
Food nutrition	5	2	3%	1.3%
Livelihood				
Electricity	2	1	1%	0.7%
Drinking water	145	98	97%	65.3%
Hygiene	143	60	95%	40%
Floor type of the accommodation	32	85	21%	56.7%
Fuel for heat	149	147	99%	98%
Asset and ownership	54	0	36%	0%

Compared to the Baseline Study, the number of households in deprivation has decreased in terms of sub-indicators such as years of schooling, child mortality, flooring of ger, apartment, while school of attendance, food nutrition, electricity, drinking water, sanitation, and cooking fuel, in terms of sub-indicators such as asset ownership.

The MPI is determined by multiplying the two indices: the proportion of the poor in total (H) and the intensity of multidimensional poverty (A).

$$MPI = H \cdot A$$

Using the deprivation score for each of the above households and the number of households, calculate the multidimensional headcount ratio (H) to obtain the following results.

$$H = q/n = 151/660 = 0.229$$

Here n is the total number of people and is calculated as the sum of the number of households in each household, q is the number of people affected by poverty according to the MPI methodology, which is calculated by adding the number of households in each household in deprivation.

The calculation of the intensity of multidimensional poverty (A) is as follows; The sub-index is calculated by the following formula to correct the deprivation score for households with a deprivation score of less than 1/3.

$$A = \left(\sum_{i=1}^{n} c_i(k)\right)\Big/q = 55.111/151 = 0.365$$

will be displayed. (All calculations performed here can be viewed by running the Stata program Do-file)

Using the results of the above two sub-indices, the calculation of the MPI in the Endline Study is as follow;

$$MPI = H \cdot A = 0.229 \cdot 0.365 = 0.084$$

In Bulgan soum, Arkhangai aimag, the comparison of the MPI during the Endline Study and the Baseline Study are shown in the table below.

Table 4. MPI comparison

Study stage	MPI $(MPI = H \cdot A)$	Multidimensional poverty headcount (H)	Intensity of multidimensional poverty (A)	No. of people in deprivation(q)
Baseline	0.115	0.297	0.389	175
Endline	0.084	0.229	0.365	151

As can be seen from the table above, the MPI decreased (by 0.031) from 0.115 in the Baseline Study to 0.084 in the Endline Study. In particular, the proportion of the poor in the total population, which is estimated in multidimensions, decreased from 0.297 in the Baseline Study to 0.229 in the Endline Study. In other words, 29.7% of the total respondents in the baseline survey were poor, while in the endline survey, the figure dropped to 22.9%. The intensity of multidimensional poverty decreased from 0.389 to 0.365 in the Endline Study and by 0.024. This means that 38.9% of the households in deprivation in the Baseline Study were in total poverty, while in the Endline Study it decreased to 36.5%. Thus, both sub-indices declined significantly, contributing to the final drop in the MPI.

It can be concluded that the MPI decreased as a result of the project implementation from the baseline to the final stage, which improved the overall quality of life of the sampled households. However, it should be noted that 7 of the 10 sub-indicators used to calculate the MPI have improved, or in many respects, the number of households affected by poverty has decreased, while 3 indicators have deteriorated. Decreases in both indices of the MPI reaffirm the improvement in the socio-economic situations of the households.

Evaluation of socio-economic outcome indicators other than the MPI

This section of the report presents changes in socio-economic situations of the residents along Teel LPA with the MPI along with analysis of the primary and secondary quantitative and qualitative data.

As mentioned in the previous section, the MPI base was 0.115, but dropped to 0.084 in the Endline Study. In particular, a decrease in the poverty index indicates an improvement in the socio- economic situations of the local population. Using other variables not used in the index calculation, the well-being of the respondents is also summarized in this section.

Adequacy and sources of the household income

The majority of households (80%) in the Endline Study rated themselves as middle class, 8% as upper-middle class, and 12% as lower-middle class. Table 5 shows how household income and its structure have changed over the last three years, one of the key indicators for measuring livelihoods. 150 households surveyed earned an average of MNT 8,452,628 in the past three years, of which 72.15% came from basic work and sources, 13.5% from additional income, 19.4% from social welfare, pensions and benefits, and 6.7% from use of natural resource and the remaining came from hunting and wildlife resources. In terms of each source of income, over three years, income from permanent employment, social welfare, pensions, benefits, and natural resource use have increased significantly.

Table 5. Household annual income, by MNT

№	Source of income	2018	2019	2020	3-year	%
1	Permanent employment	5,518,467	5,604,533	7,174,480	6,099,160	72.2
2	Additional income	1,433,333	1,144,000	838,333	1,138,556	13.5
3	Social welfare and pension and benefits	1,177,827	1,308,067	2,444,260	1,643,384	19.4
4	Hunting (marmot, deer antlers, ore masks)	1,000	-	0.013	333	0.0
5	Natural resource exploitation (logging, collecting nuts and fruits)	322,001	271,833	1,101,867	565,234	6.7
Total annual income		8,452,628	8,328,433	11,558,940	8,452,628	100

Figure 8 and Figure 9 show a comparison of the monthly household income by frequency, mean and median comparing the project Baseline Study and Endline Study results. In the base year, 57% of the 150 households had a monthly income of less than MNT 500'000, while 31% of the 150 households had an income of less than MNT 500'000. In addition, the share of high-income households increased in the Endline Study compared to the Baseline Study. The average monthly household income increased from MNT 448,750 in the base year to MNT 714,250 in the Endline Study period, and the average household income increased from MNT 553,837 in the base year to MNT 963'245 in the Endline Study period, which has improved household livelihoods over the past three years.

Figure 8. Monthly income, in 2018 and 2020

Figure 9. Monthly income (mean and median), in 2018 and 2020

One of the five main objectives of the project was to improve the livelihoods of the households through increasing the number of sources of income and creating sustainable jobs. The surveyed 150 households had an average of 4-5 members, 2-3 of whom earn an income. In other words, 50% -60% of household members earn income. Table 6 also shows that the majority of households (102) had two or more sources of income.

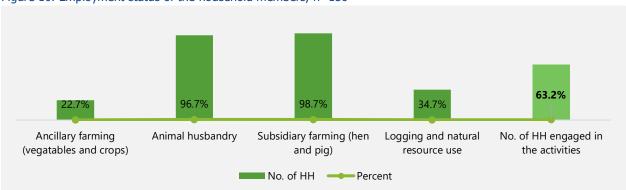| No. of sources of income	No. of households	Proportion
One stream of income	48	32%
Two streams of income	79	53%
Three streams of income	18	12%
Four streams of income	5	3%
Total	**150**	**100%**

Table 6. The number of streams of income

Figure 10 shows that 63.2% of the 150 surveyed households in 2020 were engaged in household farming, and almost all of them were engaged in animal husbandry and ancillary farming. Specifically, 96.7% of all households earned income from animal husbandry, 98.7% from subsidiary farming, 22.7% from agriculture, and 34.7% from logging and natural resource use.

Figure 10. Employment status of the household members, n=150

In the past three years, 20% of all households have been able to process agricultural products to meet their needs, and 43.3% of them have been able to supply surplus products to the market and earn income. For example, in the past three years, households have developed agricultural products to meet their needs, supply them to the market, and support their livelihoods.

Adequacy of the household income is another indicator of improved household livelihood in 2020 compared to that of 2018. Of the 150 households surveyed in the 2018 baseline survey, 43% said that their household income was minimal or insufficient for their daily basic needs, while 29.3% of the 150 households surveyed in the 2020 survey said so. Compared to 2018, the 2020 survey results show that the proportion of households whose household income met their daily needs and had access to short-term clothing, and who are able to exceed their needs and save, has increased, indicating that household livelihoods have improved (Figure 11).

Figure 11. Adequacy of the household income, n=150

Partnership benefits

142 out of the 150 households (94.7%) were members of a partnership with co-managed natural resources in the Endline Study. Partnership members benefitted greatly as a partnership member. As informed, there were almost no negative consequences of being a partnership member. TableTable 7 shows that a large proportion of households responded that they had improved their livelihoods by joining a community group, receiving dividends, removing dead trees from the forest, and becoming more environmentally

friendly. It was followed by the benefits of developing business plans and projects, receiving equipment and other support, improved livelihoods through participating in trade fairs.

Table 7. Benefits of being partnership member, n=142
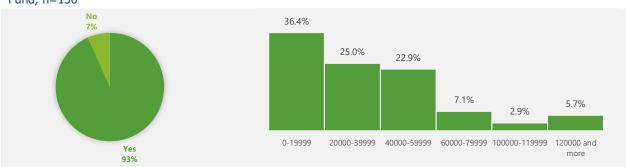
№	Benefits	No. of households	Proportion
1	Improved livelihood through receiving dividends	100	70.4%
2	Improved livelihood through collecting dead trees from the forest	92	64.8%
3	Improve livelihood through developing business plan, project and receiving equipment as support	82	57.7%
4	Improved livelihood through attending in trade fairs	32	22.5%

Becoming a member of a partnership not only contributed to the household livelihood, but also helped them to use their pastures, protect their forests, and clean their rivers together. This shows that it is highly beneficial for households to become members of a partnership with co-managed natural resources.

Joint Savings Fund and its benefits

One of the key outcomes of this project, which aims to protect forest-steppe ecosystems and endangered species with the participation of local communities, is the establishment of partnership and community-based savings funds. 140 out of 150 (93%) had contributed to the Joint Savings Fund, putting an average of MNT 47,045 per month. 36.4% of them saved less than MNT 20,000 per month and 84.3% saved less than MNT 60,000 per month (Figure 13)

Figure 12. Membership of Joint Savings Fund, n=150

Figure 13. Money collected in the Joint Savings Fund, by MNT, n=140

87.7% of all households benefited from being part of the savings group. 91.4% of them had access to unsecured, low-interest loans, 87.9% had contributed to improving their livelihoods, and 82.1% improved their financial literacy and financial discipline. In addition, 89.3% of these people saw improved cooperation of the community members. It can be concluded that less than 5 percent of the average monthly income of MNT 963'245 (MNT 47'045 per month on average) was saved, and most households in the savings group were able to benefit.
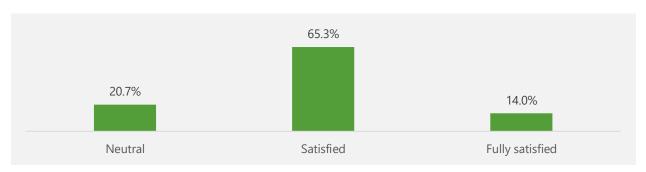
Figure 14. Benefits from Joint Savings Fund, proportion of the households, n=140

Changes in household livelihoods and the respondents' satisfaction over the past three years

In addition to quantitative analysis of changes in living standards, the survey assessed how satisfied the local people were with their lives and how they felt that their livelihoods had improved, as shown in Figure 15 and Table 8. There was no household in the 150 households that had little satisfaction. On the other hand, 14.0% of them were very satisfied with their improved livelihoods, 65.3% were satisfied, and the rest were neutral; Most of the households were satisfied with their lives.

Figure 15. Satisfaction with the livelihood, by percent, n=150

The Endline Study findings show 40.7% of all households saw improvements in their livelihoods, 50.0% saw neither improvement nor deterioration while 14% experience deterioration. Looking at the findings by a membership, 25% of non-community households said their livelihoods deteriorated, while 8.5% of partnership member said their livelihood deteriorated. Since the livelihoods of community members have improved and are higher than those of non-community members, it can be concluded that the project has made a significant contribution to improving the livelihoods of households (TableTable 8).

Table 8. Changes in the household livelihoods over the past three years

№	Household livelihood	No. of households	Proportion	No. of households with membership	Proportion	No. of non-member households	Proportion
1	Significantly improved	9	6.0%	9	6.3%	0	0.0%
2	Slightly improved	52	34.7%	49	34.5%	3	37.5%
3	Remained the same	75	50.0%	72	50.7%	3	37.5%
4	Slightly deteriorated	13	8.6%	12	8.5%	1	12.5%
5	Significantly deteriorated	1	0.7%	0	0.0%	1	12.5%

| Total | 150 | 100% | 142 | 100% | 8 | 100% |

Interviewed partnership members and community associations also reported that the project has contributed to improving the livelihoods of the local population. As an example, Quotation 1 is provided, the interview with male-headed single household.

Quotation 1. The partnership members saw increased sales of the dairy products

The project provided dairy equipment to support the implementation of the partnership business plan. Our curds were sold out. Our partnership specializes in the production of dairy product. In the past, we used to do it individually, but now we have partnered to increase the variety of dairy products and produce more.
Interview with single male headed household
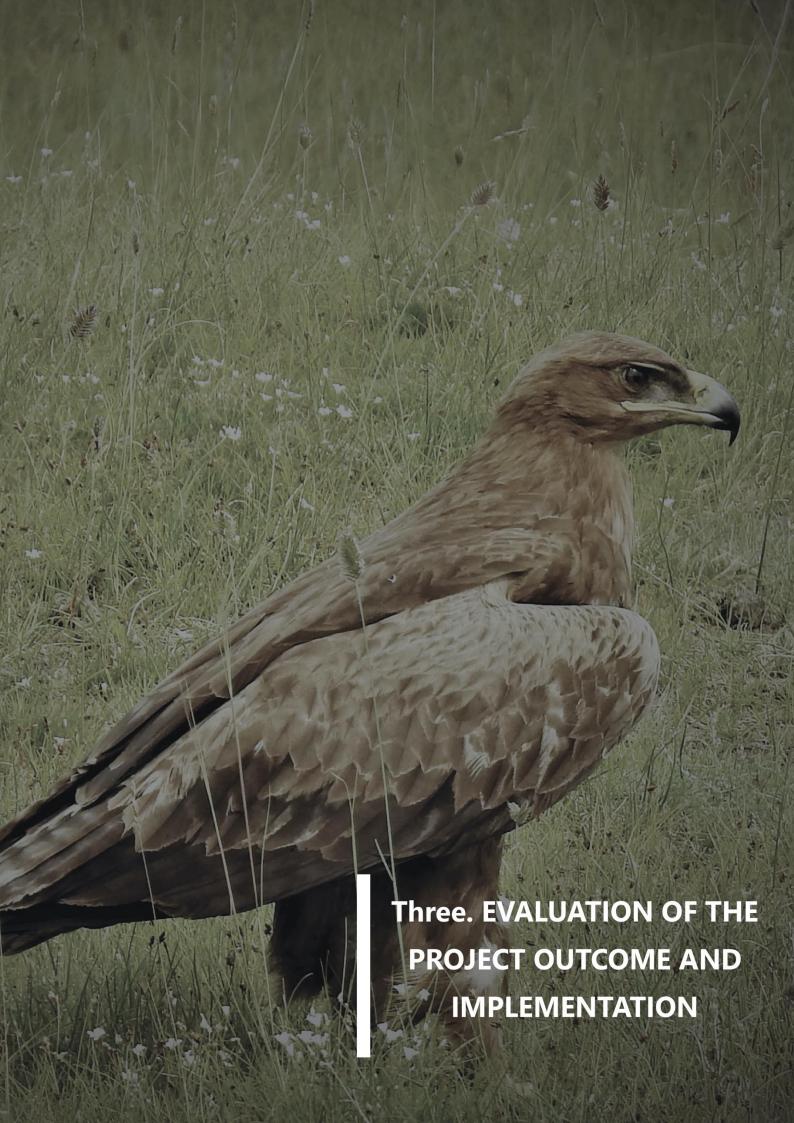
The Government of Mongolia's COVID-19 prevention policies, suspending socio-economic activities to some extent, were likely to impose some implication to the livelihood of the households. 2 out of 9 households whose livelihoods have improved significantly in the past three years was due to COVID-19 and 2 were because of COVID-19, 2 were because of international projects, 2 are related to employment, and the rest are due to climatic conditions and increased household productivity. The two households benefited from the international projects said their livelihood significantly improved while 6 households said their livelihood saw slight improvements. No one said their household livelihood deteriorated, or remained the same because of projects. This indicates that the project saw the desired results, contributing to improving the livelihood of the households.

Quotation 2. Increased production of the dairy products

Last spring, the ZSL project asked one community to propose a project worth 7 million MNT. Because we are close to agriculture, we bought agricultural equipment and used them to plant fodder on 20 hectares. Now that we have the equipment, we don't have to buy fodder, we have to plant it ourselves. We also make dairy products and sell them at trade fairs.

Interview with partnership leader

Three. EVALUATION OF THE PROJECT OUTCOME AND IMPLEMENTATION

Three. EVALUATION OF THE PROJECT OUTCOME AND IMPLEMENTATION

Outcome 1: Biodiversity (Endangered Species) Conservation and Monitoring

When asked how much the wildlife population has changed over the past three years, 44% said it has increased, 9.3% said it has decreased, and 46.7% said it has remained unchanged. 28.6% of the people (9.3%) who believe that the number of wild animals has decreased, consider that the number of wild animals is high, 57.1% consider it to be optimal, and 14.3% consider it to be low. In terms of membership, 14 respondents (9.3%) who believe that the number of wild animals, are from the partnerships, including Artsat 3, Bayanbulag 1, Naranbulag 1, Buural Khangai 2, Tekhkhairah 3, Jarantai 1, Naranbulag 1, Undurkhutul 1, and Temeen Chuluun 1.

Figure 16. The number of wildlife population over the past three years, n=150

Figure 17. Degree of the changes in number of wildlife population over the past three years, n=15

Musk deer. 40 households (26.7%) of the 150 households said that they saw the musk deer, of which 26% saw them alive and 0.7% saw them dead. 50% of these 40 households saw the musk deer once a year, 40% occasionally (2-12 times), and 10% frequently (13 or more times a year). People who saw the musk deer reported that they were on average 59 km away from the soum center, 15 km at the closest and 70 km at the furthest. People often saw the musk deer from surveillance cameras and while following the livestock. Also, the musk deer is often identified by their traces. 90% of the above mentioned 40 respondents were able to recognize the musk deer easily while 10% were not.

Falcon. 41 households (27.4%) of 150 said that they saw falcons, of which 26.7% saw them alive and 0.7% saw them dead. 31.7% of these 41 households saw falcons once a year, 41.5% occasionally (2-12 times), and 26.8% frequently (13 or more times a year). These people saw falcons away from on average 35 km from the soum center, 4 km at the closest and 150 km at the furthest. Falcons were often seen in the morning. 82.9% of 41 people who saw falcons, were able to recognize the them with no difficulty while 17.1% were not.

Eagle. 113 households (75.3%) of the 150 households saw eagles alive. 9.7% of these 113 households saw eagles once a year, 35.4% occasionally (2-12 times), and 54.9% frequently (13 or more times a year). Eagles were seen on average distance of 28.9 km away from the soum center, 1 km at the closest and 80 km at the furthest. Eagles were usually seen in the morning. 81.4% of these people were able to spot eagles, while 18.6% were not.

Marmot. 120 households (80%) of the 150 households saw marmots, of which 79.3% were alive and 0.7% were dead. 12.5% of these 120 households saw marmots once a year, 39.2% occasionally (2-12 times), and 48.3% frequently (13 or more times a year). The marmots were spotted an average 30.6 km away from the soum center, 1 km at the closest and 100 km at the furthest. The marmot is often identified by their hole. 89.2% of these 120 people were able to recognize marmots, while 10.8% were not.

4.7% of the respondents said that poaching increased, 10.7% remained unchanged, 45.3% decreased, 14% decreased significantly, and 25.3% did not know. When asked who poached, 22% of locals, 22% of soum center residents, 35.3% of aimag center residents, 22.7% of them from Ulaanbaatar, and 46.7% said they did not know.

Figure 18. Changes in poaching over the past three years, n=150

■ Increased	■ Remained the same	■ Decreased	■ Decreased dramatically	■ Do not know
4.7%	10.7%	45.3%	14%	25.3%

According to the respondents, the wildlife population has increased as a result of the project. In particular, the number of musk deer and marmots has increased significantly. For example, in the last three years, the number of marmot holes has increased, deer antlers are increasingly found, and herd grazing has increased. According to the local people, the increase in population numbers of endangered species was the result of the improved community surveillance, camera surveillance, restriction of illegal logging, and improved regulations. The local authorities and officials saw this trend attributed to reduced poaching and improved legal environment. The partnership leaders were linking this trend to increased surveillance at the forest and the local people's improved environmental awareness gained from the project trainings.

Quotation 3.
… Forming a partnership, the local people's environmental and wildlife awareness and their attitude have improved. Also, poaching decreased.
(Interview with a representative of soum Governor's office)
Quotation 4
… The population of the marmot increased significantly. During forest monitoring, 200-300 marmots can be spotted. The decrease in the marmot population was related to illegal hunting for food. The increased in the marmot population is pertaining to the improved legal environment and its enforcement as well as increased awareness and attitude of the local people.
(Interview with nature reservationist)
Quotation 5
… There has been increase in the number of endangered species, including musk deer. It is a result of the improved natural conservation and activities of the nature reservationists. To ensure the sustainability, these people should be incentivized.
(Interview with natura reservationist)

According to an official from the Department of Environment and Tourism of Arkhangai aimag, wildlife resources have been increasing in recent years because of the improved legal environment. However, the number of some animals are unlikely to increase due to illegal hunting and overgrazing.

Outcome 2: Community-Led Sustainable Forest Management

When asked how much forest resources have changed over the past three years, 18.7% of the respondents said the forest conditions have improved, 41.3% said they have deteriorated, and 40% say there has been no change. According to 30.6% of these people (41.3%), the intensity of the deterioration was high (30.6%), moderate (50%), and low (19.4%). The level of pasture deterioration was regarded as high (30.6%) moderate (50%) and low (19.4%). 28 respondents (18.7%) said that forest resources have improved were from the partnerships, namely Bayanbulag 7, Byatshanchuluu 3, Mogoikhon 3, Tekhkhairah 3, Jarantai 1, Naranbulag 3, Undurkhutul 1 and Temeen Chuluun 6 respectively.
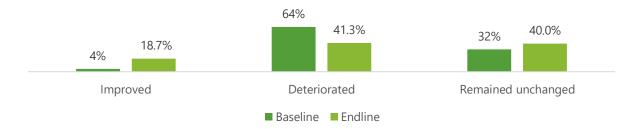
Figure 19. Forest conditions, n=150

| 18.7% | 41.3% | 40.0% |

■ Improved ■ Deteriorated
■ Remained unchanged

Figure 20 Degree of changes in the forest conditions n=150

| Deteriorated | 30.6% | 50.0% | 19.4% |
| Improved | 21.4% | 64.3% | 14.3% |

■ Significantly ■ Moderately ■ Slightly

In the Baseline Study, 64% of households believed that forest conditions had deteriorated over the previous 5-10 years, 32% had not changed, and 4% had improved. Following the implementation of the projects, the responses of the improvements in the forest conditions increased by 14.3 percentage point and the responses of deterioration decreased by 22.7 percentage points. This is a very good indicator seen over the past 3 years.

Figure 21. Changes in the forest conditions, by Baseline Study and Endline Study

4% | 18.7% | 64% | 41.3% | 32% | 40.0%
Improved | Deteriorated | Remained unchanged

■ Baseline ■ Endline

Prior to the project, the entire forest was in crisis. This is due to the fact that residents of the aimag center were harvesting firewood from Bulgan soum of Arkhangai aimag. However, following the implementation of the project, the communities reported that the situation has significantly improved due to the closure of paths to illegal logging, camera surveillance, and active patrols. In addition, logging became under better monitoring as a result of permitting certain areas for the partnerships to collect dead trees.

When asked if the respondents had heard of illegal logging in the past 12 months, 38% of them had heard while 62% had not. However, the frequency of illegal logging being heard 1-2 times was 45.6%, 7% 3-5 times and more than 5 times 15.8%. The remaining respondents could not remember how many times it had happened. In overall, the respondents agreed that there has been a significant reduction in illegal timber logging.

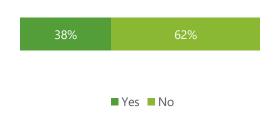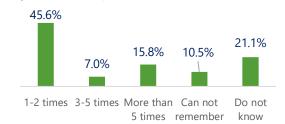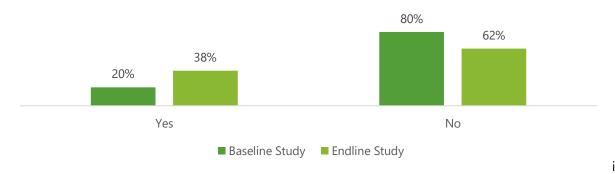Figure 22. Illegal logging being heard, n=150

| 38% | 62% |

■ Yes ■ No

Figure 23. Frequency of illegal logging being heard in the past 12 months, n=150

45.6% | 7.0% | 15.8% | 10.5% | 21.1%
1-2 times | 3-5 times | More than 5 times | Can not remember | Do not know

During the Baseline Study, 80% of households had not heard or seen any illegal logging in the LPA, while 20% had heard. The change in the percentage of people who received information about illegal logging increased by 18% due to improved patrols of the local people.

Figure 24. Illegal logging being heard, comparison between the Baseline Study and Endline Study

In the past three year period, 8.7% of the respondents said illegal logging had increased, 14.7% said it had remained the same, 63.4% said it had decreased, and 13.3% said they did not know. When asked who was illegally logging, 20.7% said they were locals, 26.7% said they were from soum centers, 45.3% said they were from aimag centers, 6.7% said they were from Ulaanbaatar, and 34% said they did not know.

Figure 25. Changes in the illegal logging in the past 3 years, n=150

When asked if a forest patrol team was formed, 90.7% said it was established, while the remaining 9.3% said it was not. The number of forest patrols per month is 18.4 times, with a minimum of 1 and a maximum of 99.

Figure 26. Formation of the forest patrol team, n=150
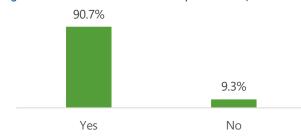
Table 9. The number of patroling per month

At most	99
At least	1
Mean	18.4
Median	3
Mode	3

In 2019, 36 cases of illegal use of natural resources were detected in the soum, and the number dropped to 18 in 2020, which were informed by the active patrols and the local population. According to the figure above, the number of offenses has halved in two-year's time.

The partnership members benefited from working together collecting firewood, with the right to clear and rehabilitate the forest. They were able to increase their sources of income collecting pine nuts and fruits and firewood in the permitted areas. The local authorities and officials also agreed that community-based partnerships enabled the use of natural resources in accordance with the law. There could be more income generating opportunities if they expand their activities to the level of cooperatives. According to the partnership leaders, collecting firewood from the permitted areas provided an opportunity to generate a

new income source. A single headed household representative said that he was satisfied with being allowed to collect firewood from the forest and contribute to the restoration of the forest at the same time. The forest patrols were satisfied with the legal logging activities. All of the stakeholders said that forest conditions have improved over the past three years, scoring 5 out of 5.

There has been little change in the local budget from natural resources in the last two years

Table 10. Amount of the revenue collected from the natural resource to the local budget, by MNT

№	Sources of income	2018 (MNT)	2019 (MNT)
1	Forest	30,099,250	31,316,336
2	Animals	280,000	420,000

In addition, the local community has been able to work as a subcontractor for a professional organization and to oversee the logging activities of professional organizations.

Quotation 6.
...As a partnership, collecting firewood and pine nuts is conducted on a seasonal basis. In the fall, the local people were able make more income from pine nuts.
(Interview with a partnership leader)
Quotation 7.
...Illegal logging is now completely under control, no longer recorded. Being vigilant, active patrols frequently patrol. They check people's identity cards and permission slip to allow them go into the forest. No all the local households make living solely from the use of the natural resources. The local people ask permission from the partnership to conduct logging activities and work in groups.
(Interview with active patrols)
Quotation 8
...Two of the partnerships of our bagh organize forest cleaning activities 2 times a year, in the spring and fall as for the request of the local department of environment. The local people engage in these activities and sell the collected trees to make income. In the past 2 years, a total of 4 forest cleaning activities were conducted. In the last fall, the local people were able to make more money because of the more yield of the pine nuts. Some of them were able to pay their herder's loan and tuition fee.
(Interview with a bagh governor)
Quotation 9
...It's the second year that our partnership is getting involved in the forest cleaning activities. The partnerships are collaborating on planting and protecting the trees. One can make daily income of MNT 200,000-300,000 from the forest cleaning activities.
(Interview with partnership leader)

The local people are able to use and restore forest resources in accordance with the law, and are interested in doing more to expand their operations. In addition to the rational use of natural resources, it is important to improve the quality of restoration activities and learn how to interact with nature in the future.

Outcome 3: Community-Led Sustainable Pasture Management

When asked how pasture conditions have changed over the past three years, 6.7% said they have improved, 73.3% said they have deteriorated, and 20% said they have not. The intensity of the pastureland degradation rated by the respondents who considered pastureland degradation was high (43.6%), moderate (41.8%) and low (14.5%). In terms of the partnership members, ten respondents (6.7%) said that pasture conditions had improved, , are from Bayanbulag 2, Mogoikhon 2, Teh Khairaikh 1, Jarantai 1, Naranbulag 1, Undur Khutul 1, Temeen Chuluut 1, and Byatshanchuluun 1.
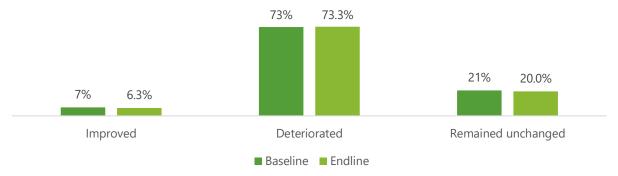
Figure 27. Pasture conditions, n=150

Figure 28. Degree of the pasture land deterioration

| .70% | 73.30% | 20% |

- Improved
- Deteriorated
- Remained unchanged

| 30% | 50% | 20% |

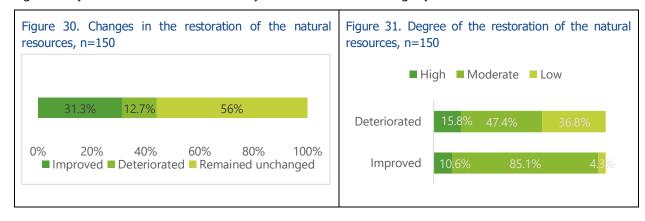0%   50%   100%

- High ■ Moderate ■ Low

In the Baseline Study, 73% of households estimated that pasture conditions had deteriorated over the last 5-10 years, 11% had not changed, and 7% had improved pasture conditions. The comparison below shows that pasture conditions have not changed in the past 3 years.

Figure 29. Pasture land conditions, n=150, by the Baseline Study and Endline Study

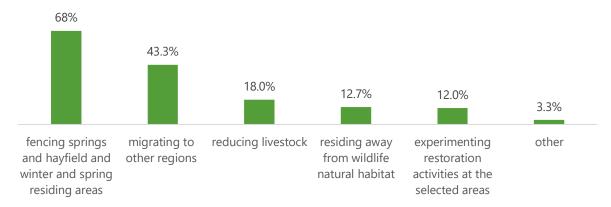|	Improved	Deteriorated	Remained unchanged
Baseline	7%	73%	21%
Endline	6.3%	73.3%	20.0%

- Baseline ■ Endline

Herders attribute the deteriorating pasture conditions to an increase in the number of livestock. When asked how the natural resource restoration changed over the past three years, 31.3% said it has improved, 12.7% said it has deteriorated, and 56% said there has been no change. 47 households (31.3%) of 150 households said that the restoration of the natural resources had improved, of which 10.6% said it had improved significantly, 85.1% said it had moderately, and 4.3% said it had slightly.

Figure 30. Changes in the restoration of the natural resources, n=150

| 31.3% | 12.7% | 56% |

0%   20%   40%   60%   80%   100%
■ Improved ■ Deteriorated ■ Remained unchanged

Figure 31. Degree of the restoration of the natural resources, n=150

■ High ■ Moderate ■ Low

	High	Moderate	Low
Deteriorated	15.8%	47.4%	36.8%
Improved	10.6%	85.1%	4.3%

In terms of the type of activities implemented for natural resource restoration, 68% of them were related to fencing springs, hayfields as well as winter and spring residing areas, 43.3% of them were related to migrating to ensure the balanced grazing of pasture land, 18% of them were from reduced livestock numbers, 12.7% of them were related to residing away from wildlife natural habitats and 12% of them were related to experimental restoration activities at the selected areas.

Figure 32. Activities conducted to restore natural resources and pasture land, n=150

Category	Percentage
fencing springs and hayfield and winter and spring residing areas	68%
migrating to other regions	43.3%
reducing livestock	18.0%
residing away from wildlife natural habitat	12.7%
experimenting restoration activities at the selected areas	12.0%
other	3.3%

It was noted that the pasture conditions have been deteriorating over the past three years. The reason for the deteriorating pasture condition included the increase in the number of livestock and climate change. In order to improve the condition of pasture conditions, the local people are taking actions such as rotating pastures, fencing hayfields, and keeping winter camps untouched for in the autumn and spring times.

The local authorities emphasized the importance of improving the quality of the livestock while reducing its heads, reducing the number of herders from other regions, in particular those from the aimag center, to improve pasture conditions.

The partnership leaders were more inclined to restricting the number of herders coming from other regions and partnership members' migration in a unified manner.

All the partnership members emphasized the importance of moving around frequently to avoid overgrazing.

No significant results have been seen because of insufficient participation of the herders to move around.

Quotation 10
...The herders lack awareness of pasture management. Overgrazing is happening on 10-15 percent of the pasture land because of the increasing number of herders from other regions.
(Interview with representative of the partnership association)

Quotation 11
...Increasing number of livestock is leading to overgrazing. There is little grazing land and drinking water left around. Forming a partnership, we are able to collaborate on migrating and fencing the hayfields.
(Interview with partnership leader)

Quotation 12
...We as a partnership member have now increased awareness of pasture land capacity and yielding. When one household doesn't migrate and other two households migrate, the desired results can not be achieved. This year, all of the households leave the area together to restore the pasture land. We out migrated Khoid Tamir.
(Interview with single headed household, partnership member)

Quotation 13
... Pasture land around here has increasingly seen deterioration. In the past few years, pasture yield is deteriorating. Yet, the number of livestock is increasing.
(Interview with an active patrols)

| Quotation 14 |
|---|
| *...The herders should give more importance on the efficiency and quality of their livestock. They should reduce the number of livestock and intensive animal husbandry. They should choose between 10–20-liter milk from a number of cows or getting the same amount of milk from 2-3 cows. The latter for sure has more economical benefits.* |
| (Interview with an active patrols) |
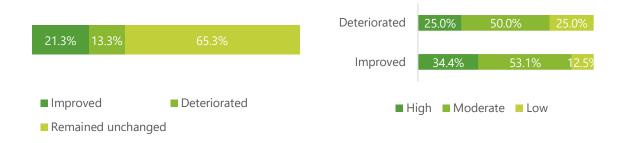
Stakeholders emphasized the need for better pastureland management policies to improve local pasture conditions, as well as the need for herders to rotate their pastures regularly and reduce overgrazing in the near future.

Outcome 4: Partnerships and Local People with Multiple Streams of Income

When asked how the conditions for earning income from natural resources has changed in the past 3 years, 21.3% said that they have improved, 13.3% said that they have deteriorated, and 65.3% said that there has been no change. The respondents (13.3) who believed that the opportunity to earn income from natural resources has decreased considered the degree of changes high (25%), moderate (50%) and low (14.3%) respectively.
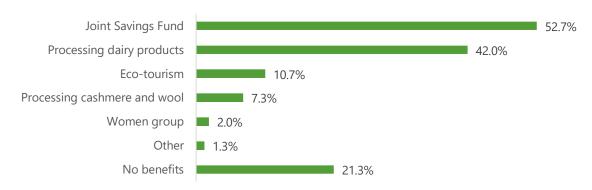
Figure 33. Income earning from the natural resources over the past 3 years, n=150

Figure 34. Degree of the changes in earning income from the natural resources, n=150
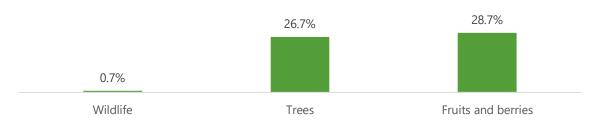
When asked how the households were economically benefitting from the project activities, 52.7% said they would increase their income through joining the Joint Savings Fund, 42% said through improved production of dairy products, and 10.7% said through eco-tourism.

Figure 35. How the households were benefitting from the project activities, types of the activities

According to the respondents, 1 of 150 households made income from wildlife, 40 households earned income from the trees, and 43 households made income from fruits and berries.

Figure 36. Income from the natural sources, %

According to the respondents, the households' diversity of income has increased. The forest cleaning activities played the main role in the increase of income. The necessary equipment for the forest cleaning activities were provided with the project; supporting the households to increase their streams of income and form the Joint Savings Fund.

Having received the equipment, the partnership leaders started production of dairy products and agricultural activities and the Joint Savings Fund contributed to the household livelihood.

With the equipment, the partnership members increased their sources of income through collecting firewood and improved production of dairy products.

The local officials also saw the partnerships having increased sources of income, such improved production of the dairy products, fencing and collecting dead trees from the forest.

Table 11. Partnership's streams of income, score ranging from 1 to 5

№		General	Forest	Dairy product	Tourism	Cashmere and wool
1	Local authorities	4,8	5	4	1	-
2	Active patrols	-	-	-	1	-
3	Single headed household	5	5	5	1	-
4	Partnership leader	5	5	3	-	-

Local authorities evaluated the project's activities "very effective". Collecting firewood played a significant role in increasing the income of partnership members. The production of dairy products has improved with the equipment support, and sales have improved as a result of participation in trade fairs. There has been some support for partnership to engage in tourism. However, because of the COVID-19 pandemic, some of the partnership activities were suspended.

Quotation 15
...There have been 3-4 forest cleaning activities with the involvement of 50-80 partnership members. Each time, each participating household earned MNT 800,000-1,000,000 on average. The partnerships spend this money on their necessities and increasing their savings.
(Interview with the representative of the partnership association)

Quotation 16
...As a part of the project, the dairy product producing equipment was provided. We sold all the products, including curd, made with the help of the equipment. Our partnership member attended a trade fair, selling our dairy products. The people were able to sell their dairy product to more extension.
(Interview with single headed household, partnership member)

Quotation 17
...We organize the forest cleaning activities together with the partnership members. We spend our money on gas and put the rest into the savings.
(Interview with the partnership leader)

Quotation 18
...Our partnership members bought one ash clay brick making machine and started selling the final products. In the last year, though, it stopped. The partnership benefitted a lot to the livelihood of the local people. The people now have much increased awareness of the environment.
(Interview with bagh governor)

Quotation 19
...The project provided us a dairy product producing machine. However, we can not fully operate the curd shaping machine. We can make heavy crem from the milk with the equipment. We have not taken any trainings on how to use the curd shaping machine.
(Interview with the partnership leader)

Quotation 20

...From the next summer, we hope we would start working. This summer becuase of the COVID-19 pandemic, we could do our tourism business.
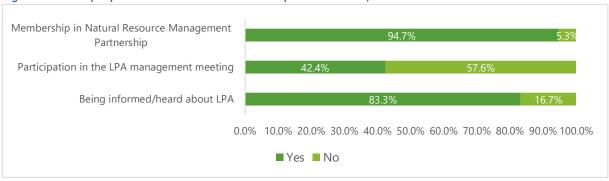
(Interview with single headed household, partnership member)

The partnership members had been able to improve their household economic situations through joint activities such as dairy processing, forest cleaning activities, collecting pine nuts and the joint savings fund. The project provided equipment and organized necessary methodological trainings. However, because of the COVID-19 pandemic, tourism and some training and development activities were disrupted. To ensure further expansion of the operation, the local authorities and partnership should work closely and activate the stakeholders' engagement.

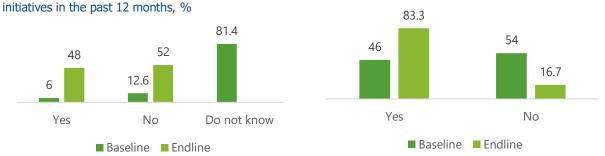## Outcome 5: Introduction of Effective LPA Conservation Management

94.7% of the respondents are members of the Natural Resource Management (NRM) partnership. 83.3% of the local people and community members know that the Mogoin Gol area of Bulgan soum of Arkhangai aimag has been designated as LPA. 42.4% of the respondents participated in the management meeting.

Figure 37. Local people's information about the local protected areas, %

At the Baseline Study stage, 9 members (6%) of the total 150 households joined the conservation initiative each year, while in the Endline Study, 72 members (48%) of the 150 households joined the conservation initiatives. At the Baseline Study, 46% of the local people knew that the North Mogoin Gol and Teel areas became LPA, but the percentage increased to 83.3% during the Endline Study.

Figure 38. Participation in the nature conservation initiatives in the past 12 months, %

Figure 39. Being informed about the LPA

25.3% of the beneficiary partnerships were involved in the development of the Environmental and Ecosystem Biodiversity Monitoring Plan, while 3.3% participated in the monitoring activities. 56.7% of them participated in environmental trainings and meetings.

Figure 40. Participation in the nature conservation activities over the past 3 years, %

In the past 3 years, the local people have participated in environmental trainings and meetings on average 4.2 times, at least 1 time and at most 30 times. On average, people participated in the development of the Environmental and Ecosystem Biodiversity Monitoring Plan 4.2 times, while they participated in the monitoring activities 2.5 times a year. There is not statistically significant gender difference in the participation in conservation training and activities.

Table 12. Participation in the environmental conservation activities in the past 3 years, by number

№	Frequency	Participation in the environmental conservation trainings and meetings	Participation in the development of Environmental and Ecosystem Biodiversity Monitoring Plans	Participation in the monitoring activities
1	At most	30	36	10
2	At least	1	1	1
3	Mean	4.2	4.2	2.5
4	Median	3	3	2
5	Mode	2	2	2

The respondents evaluated establishment of community-led LPA management was "very effective". With help of community-led LPA management, many positive changes were brought out.

The local authorities and officials believed that active patrols should be incentivized on a regular basis to further improve LPA management.

It is also important that revenues from natural resources are localized. Active patrols need to be retained to improve pasture management and control over pasture migration.

Partnership leaders gave positive evaluation on the community-led LPA management and participated in the trainings and formation of the joint savings fund.

The partnership members emphasized improved cooperation, management, and reduced disputes and disagreements among herders.

Active patrols improved their awareness of environmental protection through trainings over the past three years. In the future, it is necessary to continue the current community-led management through providing incentives for active patrols and financial support (salaries, gasoline costs).

Table 13. Stakeholders' evaluation on the community-led LPA management, 1-5

	Civil servants	Partnership leaders	Partnership member	Active patrols and nature reservationist
LPA management	4	5	4	3

*1 very poor, 2 poor, 3 moderate, 4 good, 5 very good)

On average, the LPA management was evaluated at '4' by the respondents.

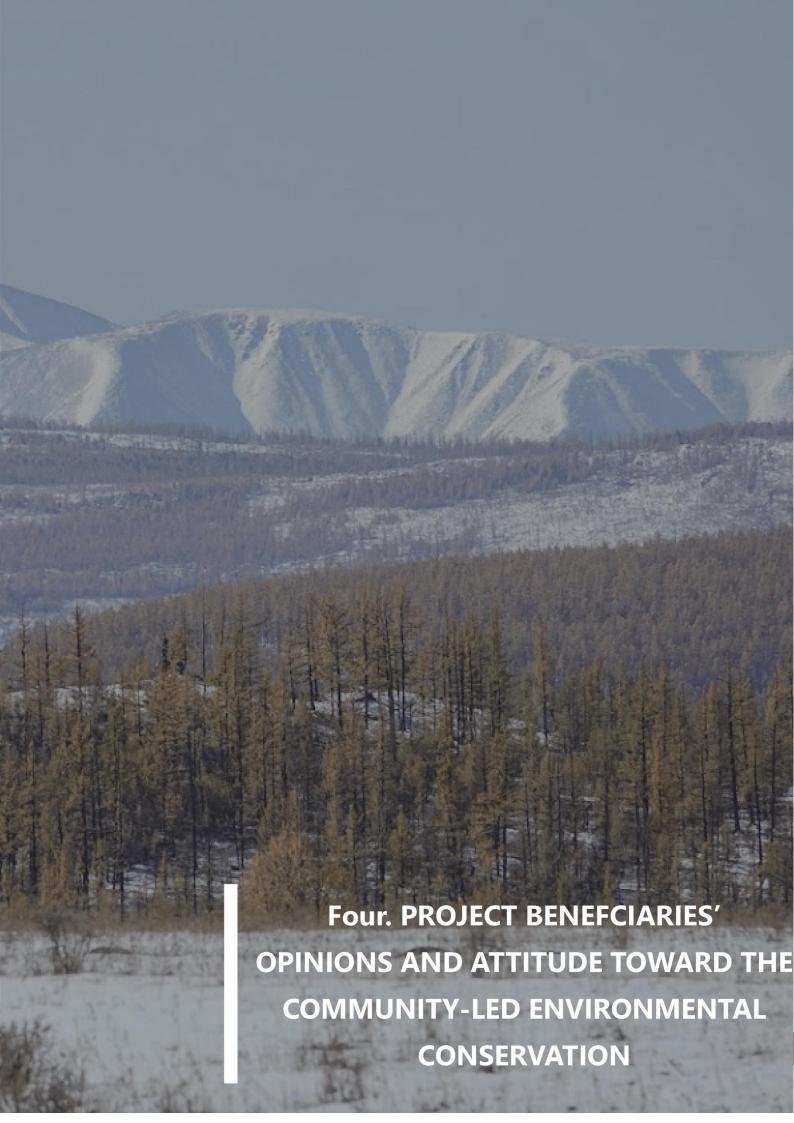| Quotation 21 |
|---|
| ...*Cooperation of the partnerships and the local authorities is poor. What they talked is poorly implemented.* |
| (Interview with partnership leader) |

Quotation 22
...*Our collaboration with the government organization is critical. For instance, in order to log, we need the official permission. It is said that the local governor is able to make MNT 40 million from the forest resources, some of which is gone to the tax. Only person they pay is a forest reservationist. They should give payment to two active patrols. They also should spend the money on the local development.*
(Interview with the partnership leader)

Quotation 23
...*As a result of the project, the herders started collaborating to protect the forest from fire and organize nature conservation activities. We intend to continue these activities even after the project ends.*
(Interview with the partnership association)

**Four. PROJECT BENEFCIARIES'
OPINIONS AND ATTITUDE TOWARD THE
COMMUNITY-LED ENVIRONMENTAL
CONSERVATION**

Four. PROJECT BENEFCIARIES' OPINIONS AND ATTITUDE TOWARD THE COMMUNITY-LED ENVIRONMENTAL CONSERVATION

Following the implementation of the project, the residents of Bulgan soum of Arkhangai aimag were surveyed on their views and attitudes toward the environment, sustainable development concepts and biodiversity, and the results of the analysis were presented in this section. The results of each of the five main project activities were summarized by age, gender, education level, and membership of the respondents in the partnerships.

The local people's attitude towards the conservation and monitoring of endangered wildlife

Over the past two years, under the project, 11 partnerships were formed, of which 10 are active with 272 members. Each partnership has an active patrol, conducted marmot point census survey, a musk deer surveillance camera, a bird species survey, organized capacity building training for active rangers, a biodiversity survey and introduced SMART wildlife monitoring. With the establishment of the partnership, the incidents of wildlife poaching have decreased, and the number of marmots, steppe eagles, falcons and musk deer species has increased by about 50 percent.

65.3% of the 150 project beneficiary households that participated in the activities to protect and monitor endangered species, said that prohibition of hunting was 'very important'. (Figure 41). In addition, 18% of them consider the banning of hunting to be 'fairly important', while 14% consider it to be 'important'. There were no statistically significant differences dependent on age, gender, or educational attainment of the respondents, with a 95% confidence interval. However, partnership members were less likely to pay attention to the ban on hunting. (F = 1.69, P-value = 0.196)
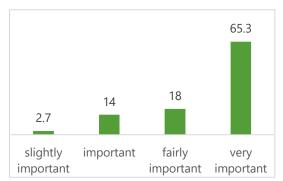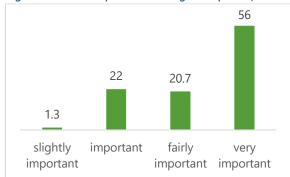
Figure 41. Banning hunting, n=150

Figure 42. Recovery of the endangered species, n=150

84 households (56.0%) of the 150 households rated the recovery of endangered species as 'very important', 'fairly important (20.7%), 'important' (22.0%) and 'slightly important' (1.3%). (Figure 42). There were no statistically significant differences depending on the age, gender, education level and membership of the participants.

In the Baseline Study, 9 households (6%) of the total 150 households joined the conservation initiatives per year, while in the Endline Study, 72 households (48%) of the 150 households joined the conservation initiatives. In the Baseline Study, 46% of the local people knew that the Khoid Mogoin Gol and Teel areas became the LPA, but this number increased to 83.3% at the Endline Study. It can be concluded that the majority of project beneficiaries believed that hunting should be regulated to some extent and the recovery of endangered species should be supported.
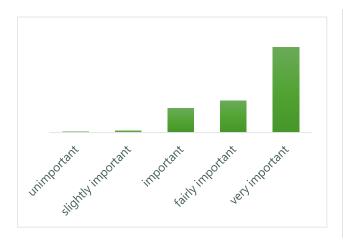
There was no statistically significant difference dependent on the age, gender, educational attainment and membership in a partnership. This shows that the majority of the project's beneficiaries believed that hunting should be regulated in some way and that the restoration of the world's endangered species should be supported.

The local people's opinions and attitude towards community-led sustainable forest management
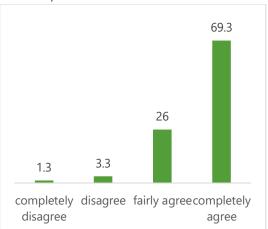
Under the project, local people and herders were organized in the form of natural resource partnerships and a management plan for the rational use of resources was developed and implemented in order to create community-led sustainable forest management. Within this framework, they have organized forest cleaning activities, assisting in natural restoration activities, such as conducting regular patrols to protect forests and riverbanks from pests and fires, setting up research sites, and organizing trainings. In addition, the LPA has enforced regulations on the priority use of non-timber forest products by communities and giving them the responsibility of conserving pastureland. On March 7, 2019, the first workshop on "Responsible Forest Management" was organized in Erdenebulgan soum of Arkhangai aimag. The fact that activities were conducted in two-year period, including the year of the outbreak of COVID-19 pandemic, means that the project outcomes are not fully known. Establishing the sustainable forest management is a long-term goal. Therefore, studying changes in the local people's attitudes in this area can be a key measurement of the project's performance.

89 households (59.3%) of the 150 households rated regulating the use of natural resources, including logging and collecting fruit and pine nuts 'very important'. 30 households (22.0%) rated it 'fairly important'. 81.3% of the respondents acknowledged the importance of the development and implementation of rules and regulations to ensure sustainable forest management. (See Figure 43). There were no statistically significant differences dependent on age, gender, or membership. However, there was statistically significant difference dependent on the educational attainment. In particular, compared to those with higher education, people with technical, vocational or lower education 42.3% (s.e = 0.158; p-value 0.008) are more likely to rate regulation of natural resource use as 'important' and 'slightly important'.

Figure 43. Importantce of regulating the use of the natural resources, n=150

Figure 44. Every citizen should be responsible for combatting illegal logging and expliotation of natural resources, n=150

Two households (1.3%) of the 150 households disagreed with the statement that every citizen should combat illegal logging and exploitation of the natural resources, and 5 households or 3.3% disagreed, while the remaining 143 households or 95.3% agreed. (See Figure 44) There was no statistically significant different dependent on the age, gender, educational attainment and membership in a partnership.
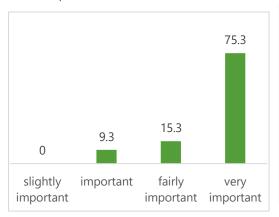
81.3% of all households agreed that it is important to regulate the use of natural resources through rules and regulations, and 95.3% of all households agreed that the participation of every citizen is important in stopping illegal logging and resource use. This means the local people acknowledged the importance and benefits of establishing community-led sustainable forest management. However, it should be noted that compared to those with higher education, people with technical, vocational and lower education give relatively little importance to the regulation of natural resource use.
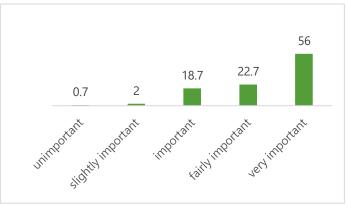
Local people's attitudes towards the creation of local protected areas with sustainable pasture management

The project implementers have developed and implemented procedures for the rational use of pastures in Bulgan soum, the establishment of a system of accountability, and the creation of the opportunities for herders to benefit from the rational use and improvement of pastures. The status of the partnerships has been clarified, a pasture use agreement has been signed, a five-year pasture protection work plan has been developed, 37 pastureland monitoring points have been established, and plants have been identified. Endline Study collected the opinion and attitudes of the project beneficiaries towards the establishment of local protected areas with sustainable pasture management.

136 households (90.6%) of the 150 households rated the importance of conserving the environment high, while no household rated it as insignificant (See Figure 45). There were no statistically significant differences dependent on age and gender. However, there was a statistically significant difference dependent on educational attainment and membership in a partnership. In particular, people with higher, technical, vocational or lower education are 36.1% more likely to underestimate the importance of protecting the environment (s.e = 0.06; p-value = 0.000) than those with higher education.

Figure 45. Importance of conserving the natural resources, n=150

Figure 46. Importance of regulating the pastureland, n=150

The respondents said that it is 'very important' (56%) and 'fairly important' (22.7%) to regulate pasture use through the activities, rules and regulations of partnerships and associations (See Figure 46). In other words, three out of four respondents believed that it was important to have rules and regulations governing pasture use and sustainable management. There were no statistically significant differences dependent on age, gender, education and membership in the partnership. This means the majority of the local people had good knowledge of the benefits and importance of creating LPA.

Local people's attitudes towards creating multiple streams of income and cooperation between herders and local communities

The local population's ability to use natural resources wisely and earn income from a variety of sources is the prerequisite for reducing poverty and improving livelihoods. Under the project, the activities to ensure gender rights and equality, create jobs for the local population, and support livelihoods and economic growth were undertaken. For instance, herders and the local people have been organized into partnerships and legal entities. This made them more productive, more responsible, and more empowered. In addition, the project provided financial and technical support to each partnership to develop and implement a small business plan. Herders and the local people have entered into agreements with relevant organizations to ensure the rational use of natural resources and the delivery of livestock products such as wool and cashmere to businesses and end users. As a result, partnership members have been able to earn income from a variety of sources, including clearing forests, selling firewood, participating in trade fairs, and selling their products. Another important result was that they had established and successfully implemented a partnership fund. The members of the partnership create monthly savings in the mutual fund, use it efficiently by joint decision, finance their activities, and provide low-interest loans to the members of the partnership without collateral.

The study looked at to what extent cooperation of the herders worked together and earned income from multiple sources and improved their livelihoods.

As shown in Figure 47, three out of four people ('very important' (52.7%) and 'fairly important' (22.7%)) considered it is important to implement projects and programs aimed at improving the social and economic situations of the local population. There were no statistically significant differences dependent on the age, gender, or membership in a partnership. However, compared to people with higher education, people with technical, vocational and lower education are 43.9% (s.e= 0.236; p-value= 0.065) more likely to underestimate the importance of implementing such projects and programs.

Figure 47. Importance of implementing projects to improve socio-economic situations of the local people, n=150
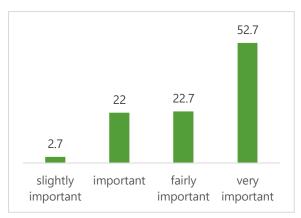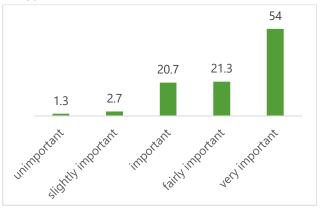

Figure 48. Importance of forming partnership and cooperative to support the cooperation of the local people, n=150

The respondents said it was 'very important' (54%), 'fairly important' (21.3%) and 'important' (20.7%) to support community cooperation and establish partnerships and cooperatives. (see Figure 48). However, 6 households (4%) of the 150 households considered the establishment of partnerships and cooperatives to be 'slightly important' and 'unimportant'. No statistically significant differences were identified in the variation analysis, which was dependent on age, gender, and educational attainment of the respondents. However, members and non-members of the partnership gave different responses, with a 95% confidence interval. In particular, compared to non-partnership members, partnership members were 65.0% (s.e =

0.362; p-value = 0.075) more likely to consider it is important to establish partnerships and cooperatives that support the cooperation of the local population.

It is the responsibility of every responsible citizen to use the natural resources wisely in their social and economic relations, as well as to protect and pass on Mongolian heritage and traditions to future generations. 68.7% of the respondents rated the protection of their heritage as 'very important', while 16.7% and 13.3% rated it as 'fairly important and 'important' respectively. However, 2 respondents (1.3%) considered it to be 'unimportant'. (See Figure 49). There were no statistically significant differences dependent on membership, age and gender. However, there was a statistically significant difference dependent on the educational attainment of the respondents. In particular, compared to those with higher education, people with technical, vocational or lower education had a 38.5% (s.e = 0.125; p-value = 0.002) probability of underestimating the importance of their heritage.

Figure 49. Importance of protecting heritage and traditions, n=150
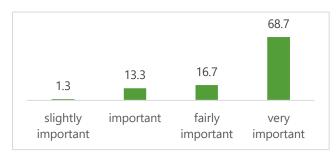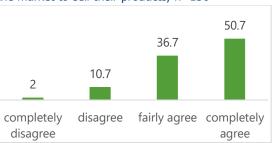

Figure 50. The local people's accessibility to enter in the market to sell their products, n=150

One of the main results of the project was to create opportunities and accessibility for the local people to use their natural and cultural resources properly, produce products and introduce them to the market. The surveyed households were asked how much they agreed with these opportunities. 76 households (50.7%) of 150 agreed that they had improved opportunity and accessibility to market. The households gave the following the responses, 'agree' 55 households (36.7%), 'do not agree' (16 households (10.7%)) and 'do not agree at all' (3 households (2.0%)) respectively. (See Figure 50). There were no statistically significant differences in these responses, depending on the age, gender, education level, or membership in a partnership.

Approximately three out of four people believe that it is important to implement projects and programs aimed at using natural resources wisely, protecting traditional heritage, and improving the social and economic situations of herders and local people. It is seen that people with technical, vocational or lower education were likely to give less importance to loving and protecting their heritage, and the importance of implementing projects and programs. The vast majority of respondents (87.4%) agreed that herders and partnership members have a diverse source of income; they now had the increased opportunity and accessibility to use their natural and cultural resources properly, and produce and market their products. An important result of the project was that 75.3% of all households believed that it was important to support cooperation of the local people and establish partnerships and cooperatives.

Attitudes of the local people towards the introduction of effective LPA protection management

The main goal of the project was to protect forest-steppe ecosystems and endangered species with the participation of the local people and to introduce standard conservation management in the LPA. In this context, the Governor's Office of Bulgan soum, the local people and herders cooperated. Also, the local authorities in Arkhangai aimag, the Department of Environment and Forest, and ecological policemen

worked closely. As a result, the local people were organized into partnerships, and on March 26, 2019, a partnership association was officially established with the participation of representatives of each partnership, rules and regulations were developed, and legal entities were put in place. Consequently, partnership members had the opportunity to unite and make their voices heard by local authorities, as well as work together to improve their skills, participate in training, become active patrols, conduct forest and pasture surveys at their permanent research sites, and restore, use and protect the environment. It is possible to cooperate with the participation of all parties. One of the important outcomes of the project is the acquisition of 137,018 hectares of land around the Khoid Mogoin Gol in Teel as the LPA.

The study looked at how the local people evaluated the benefits and importance of introducing effective LPA conservation management, and what their opinions and attitudes were.

Almost all the 150 households agreed that there was an urgent need to protect wildlife through community-led conservation management. Only one household (0.7%) disagreed as shown in Figure 51. There was no statistically significant difference dependent on age, gender and membership in a partnership. However, the answer was different depending on the respondents' educational attainment. In other words, 20.1% (se = 0.113; p-value = 0.080) are less likely than people with higher education to agree with the need to protect wildlife through such management.

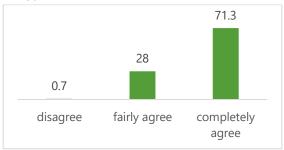Figure 51. Urgent need for protection of the wildlife, n=150

Figure 52. Importance of acquiring a certain areas as LPA, n=150

As shown in Figure 52, one in three respondents rated the establishment of protected areas as 'slightly important' or 'unimportant' while two in three rated them as 'fairly important' or 'very important'. There were no gender or gender-specific statistically significant differences. However, 69 respondents (60.1%), under the age of 39 and 81 respondents (65.1%) over the age of 40 acknowledged the importance. In addition, 66.7% of those with higher education and 63.1% of those with technical, vocational and lower education rated it as 'important'.

Respondents were asked to what extent they agreed with the Constitution of Mongolia stating that "Environmental conservation shall be the duty of every citizen" and collected their opinions and attitudes on the local people participation in the conservation of the natural resources. Figure 53 shows that almost all the respondents were aware of this responsibility. The higher age and the lower educational attainment, the less likely they agree with this responsibility. (estimated coefficient = 24.8%; s.e = 0.041; p-value = 0.000).

Figure 53. Conservation of the nature is a responsibility of every citizen, n=150
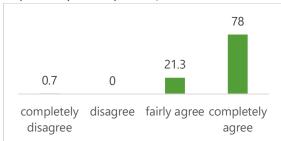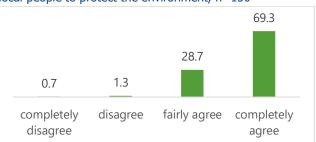
completely disagree	disagree	fairly agree	completely agree
0.7	0	21.3	78

Figure 54. The local authorities should collaborate with the local people to protect the environment, n=150

completely disagree	disagree	fairly agree	completely agree
0.7	1.3	28.7	69.3

The local people (FUG and PUG) and local Governor's Office (Department of Environment and Forest, Land Administration Offices, police and specialized inspection agencies) need to work together to protect forest and steppe ecosystems along the LPA. Figure 54 shows that 98.0% of the respondents regarded it as 'important'. However, one household and two households considered it was 'unimportant' and 'slightly important' respectively. There were no statistically significant differences in these responses depending on age, gender, educational attainment and membership in a partnership. Thus, almost all respondents believed that effective protection management needs to be introduced and is of great importance.

CONCLUSION

The stakeholders and the local communities evaluated the implementation of the ZSL-funded project "Conserving Forest-Steppe Ecosystems and Endangered Species with Community-led Network" in the area of 137,018 ha and 2 rivers (Khoid Mogoin Gol in Teel) in Bulgan soum of Arkhangai aimag 'very effective'.

Socio-economic situations of the residents along Teel LPA

The study covered the changes, measured with MPI and other socio-economic indicators, in the socio-economic situations of the residents along Khoid Mogoin Gol-Tuul LPA as a result of the project "Conserving Forest-Steppe Ecosystems and Endangered Species with Community-led Network" and the findings and results were compared to those of the Baseline Study.

The MPI is designed to measure vulnerability and deprivation of households with a set of three indicators, including education, health and living standard. In the Baseline Study in 2018, 29.7% of the 150 households were vulnerable while 22.9% in the Endline Study were vulnerable in terms of these indicators. In 2018, 38.9% of the households were in deprivation, but in the Endline Study, the number dropped to 36.5%. Therefore, with the MPI, education, health and life standards of the people living in the Teel LPA have generally improved over the last three years. In particular, 7 out of 10 indicators improved, and the indicators of household members' schooling years, infant mortality, ger and apartment floors decreased.

In the Baseline Study, the households earned an average of MNT 553,837 per month, while in 2020 they earned an average of MNT 963,224, increasing the number of people earning income and the number of sources of income. In addition, 40.7% of the 150 households estimated that their income had improved and that their livelihoods had improved over the past three years, and that all households were satisfied with their livelihoods.

The Baseline Study found that the local people lacked business experience, financial knowledge, and technical skills to improve their livelihoods. According to the Endline Study, 94.7% of all households became members of the partnership, were able to write business plans, projects, receive equipment and other support from the project, develop agricultural products, supply their needs, supply them to the market and improve their livelihoods. In addition, 140 out of 150 households joined the Joint Savings Fund receiving dividends, increasing their household income, improving financial education, and learning how to work with local people. In addition, partnership members have come to love and protect the environment through the integrated use of pastures, forests, trees, and rivers. Therefore, the partnership that co-managed the natural resources created as a result of the project has become highly important and beneficial not only for the livelihoods of the member households, but also for the environment.

Outcome and implementation of the project

According to the local population, the number of wild animals has increased by 44% and poaching has decreased by 59.3% in the past three years. The number of musk deer, marmots has increased significantly. The increase in population numbers of endangered species has been noticed by an increase in the number of marmot holes, fallen deer antlers and herd grazing. The increase in population numbers of endangered species was pertained to the project's activities such as camera surveillance, community patrols, blocked paths to illgeal logging, improved enforcement, and a change in the local peoples' attitudes. The main goal of the project, to establish a conservation and monitoring system of endangered species, has been achieved.

The fact that there was a 14.7 percentage point increase and 22.7 percentage point decrease in the local people that regarded the forest conditions have improved as a result of the project is a very good indicator

over three-years' time. Also, the number of households receiving information on illegal logging has increased by 18 percentage points, which can be explained by the improved health monitoring system. According to the respondents, prior to the project, the entire forest was in crisis. This is due to the fact that the local people were illegally logging. With the implementation of the project, the involvement of newly established partnerships, the situations have improved with the closure paths to the forest, use of surveillance cameras, and monitoring of active patrols. Moreover, the partnerships were given the opportunity to remove dead trees from the forest and contribute to their incomes while monitoring the local logging activities. Thus, illegal logging has decreased.

Pasture conditions have not changed in the last 3 years. In other words, the project's efforts to improve pasture management have not yielded results. Herders attribute the deteriorating pasture conditions to an increase in livestock numbers and climate change. The project and herders are unable to control the impacts of climate changes. According to the local population, actions to improve pasture conditions, such as rotating pastures, fencing hayfields, and relocating winter camps in autumn and spring, have had little effect.

According to the local population, the stream of their income has increased as they joined a partnership. The main factor influencing the income increase is related to forest cleaning activities. The project activities to increase the diversity of household incomes, such as providing equipment for the forest cleaning activities and running a business and supporting Joint Saving Fund have seen the desired results. The main source of livelihood for the local people used to be livestock, such as meat, wool and cashmere, whereas the project has increased income diversification and increased opportunities for legal logging and collecting firewood, production of dairy products, and tourism.

Stakeholders emphasize that the establishment of community-led network management in the LPA is "very effective". The establishment of a community-led network in the LPA has brought out positive changes; the project team and the local community have established good cooperation. There are 11 partnerships operating in the LPA. As for the members of the partnership, the current performance of the partnership is 'excellent'. For the beneficiaries of the project, importance and the efficiency of the project activities is 'excellent'. However, the stakeholders emphasized the need for the cooperation of the local people and local authorities in conservation of the forest and steppe ecosystem management in the LPA.

Project beneficiaries' opinions and attitudes towards community-led environmental conservation

Efforts to introduce community-led conservation management will yield the results in relatively long-term. Therefore, one of the important short-term outcomes of the project is citizens' understanding the importance of their participation in environmental conservation and the rational use of natural resources.

The local people said it is necessary to regulate the use of natural resources through rules and regulations, and to establish conservation and monitoring system of endangered species. In addition, 95.3% of all households agreed that the participation of every citizen is important to stop illegal logging and exploitation of the natural resources. The local people were supportive and aware of the importance and benefits of creating community-led sustainable forest management. They also acknowledged the importance of creating LPA with sustainable pasture management.

Approximately three out of four people believed that it was important to implement projects and programs aimed at using natural resources wisely, protecting traditional heritage, and improving the socio-economic situations of herders and the local population. The majority of respondents agreed that the opportunities and accessibility to the proper use of natural and cultural resources, as well as the production and marketing of products were now in place, leading herders and partnership members to a diverse source of income.

Another key result of the project was that 75.3% of the respondents believed that it was important to support community cooperation and establish partnerships and cooperatives.

To conclude, the project beneficiaries believed that every citizen's participation in environmental conservation and introduction of effective conservation management in the LPA is pivotal.

RECOMMENDATION

Under the ZSL-funded, three-year project, residents along Teel River LPA were able to earn income from multiple sources, improve their livelihoods while satisfying their needs by processing agricultural products and supplying them to the market. In 2018, at the beginning of the project, the local people with limited business experience, financial knowledge and technical skills started being empowered, trained and provided with opportunities to work together. This contributed to improving their livelihoods.

The results of this project showed that a non-cash capacity building policy is more effective. Therefore, it is important to continue all project activities aimed at improving people's livelihoods. The local authorities of Bulgan soum should take a leading role.

During the three years of the project, the local people have come to believe that it is important to introduce community-led conservation management in the LPA. It is important to continue community-led conservation management since the local people has acknowledged the importance.

The study results show that there is a need to improve awareness of the local population. For example, with one of the MPIs, the households are in deprivation. Also, the people with lower education tended to underestimate the importance of community-led environmental conservation compared to those with higher education. In addition, the project has made significant contributions to the socio-economic spheres in a short period of time, giving a special focus on educating and empowering the local people. Improved awareness of the local people in the above-mentioned areas will play an important role in achieving the project outcomes.

REFERENCE MATERIALS

1. Aichi Biodiversity Targets. (2020). Convention on Biological Diversity: https://www.cbd.int/aichi-targets/target/

2. Alkire Sabina, et al. (2011). Multidimensional Poverty Index 2011: Brief Methodological Note. Oxford Poverty & Human Development Initiative (OPHI), 1-14.

3. EU funded EG4EG Project. Brigsa, S., & Narantungalag, O. (2017). Assessment of Development Programmes' Implementation Compliance with M&E Resolution 322/89 – using as Pilot a MFALI Development Programme..

4. Zoological Society of London. Monica Wrobel, Tungalag Ulambayar, Samuel Merson, Erdenetsolmon Ganbaatar, Khaliun Tsog. (2020). Darwin Initiative Main and Post Project Annual Report. Ulaanbaatar:

5. UNDP. (2017). Development Finance Assessment for Mongolia: Diversifying finance for sustainable development.

6. United Nations, Sustainable Development Goals. (2015-2030). Sustainable Development. Department of Economic and Social Affairs: https://sdgs.un.org/goals

7. NSO. Integrated Database. (2020). Number of households, Bulgan soum, Arkhangai aimag, Western region

8. Independent Research Institute of Mongolia and Zoological Society of London. Socio-Economic Baseline Study on Local Protected Areas, September 2018-February 2019, Ulaanbaatar

9. Zoological Society of London. Project Annual Report, Darwin Initiative Main and Post, Ulaanbaatar