EVALUATING THE EFFECTIVENESS OF COMMUNITY-BASED CONSERVATION IN MONGOLIA'S GOBI DESERT

A REPORT TO THE NATURE CONSERVANCY

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As ever, all errors, omissions or opinions remain the responsibility of the authors.

TABLE OF CONTENTS

LIST OF TABLES AND FIGURES

1 INTRODUCTION

1.1 Background of the study

The research presented here is part of a larger study funded by The Nature Conservancy (TNC), which aims to show how sustainable grassland management can reduce poverty and conserve nature at the same time (Leisher *et al*., 2010). Worldwide, grasslands provide livelihoods for nearly 800 million people and are a source of forage for livestock, wildlife habitat, and a host of other resources (White *et al.*, 2000). However, grasslands are severely degraded. It is estimated that around three quarters of the world's grazing land has deteriorated to such an extent that it has lost at least a quarter of its animal carrying capacity (UNEP, 2005).

The TNC study follows the Positive Deviance Approach,[1] focusing on what works, and how it works. In choosing this approach, the fundamental assumption is that there is more to learn from conservation successes than conservation failures. Therefore, three projects were selected that were likely to have succeeded in both conserving biodiversity and improving the local well-being of people. The case studies were: the Northern Rangelands Trust in Kenya, the Umgano Project in South Africa, and the "Gobi Component" of the GTZ Program "Conservation and Sustainable Management of Natural Resources" in Mongolia. Other criteria for choosing these projects were that they had been in existence long enough to generate effects, were located in a developing country, and were funded by an international donor. This report describes the assessment of the GTZ Gobi project in Mongolia.

The research had two main objectives. First, to establish which have been the ecological and socioeconomic benefits of the project, and to quantify these as far as possible, and second, to find out how these benefits had been obtained, *i.e.*, to determine the success factors of the project that might be replicated elsewhere.

The report is set up as follows: In the remainder of the introduction some context is provided by briefly describing the GTZ Gobi project and some important general developments that took place in Mongolia before, during and after the project. It also sets out the main methodology of the research. In Sections two to four, the empirical findings of the ecological and socioeconomic analyses are discussed, after which the success factors of the project are presented in Section five. Section six provides a synthesis of the qualitative and quantitative analyses of the socioeconomic findings, and Section seven concludes.

1.2 Developments in Mongolia's livestock sector

The project operated against a background of a country in transition from a communist, collectively organized past, heavily subsidized by the Soviet Union, to a democratic future where it had to participate in the capitalist markets, and was supported by international donors. The end of the Soviet subsidies led to the partial de-industrialization of Mongolia, and after the dismantling of the socialist livestock collectives (*negdels*), its livestock was privatized. Many of the people who had lost their jobs in industry and the *negdels* reverted to subsistence herding. The number of herding households approximately doubled, and many of these new

[1] See www.positivedeviance.org/about_pd/index.html for a description.

herders were inexperienced at pasture and livestock management. Moreover, the services once provided by the *negdels*, such as coordination and transport for seasonal moves, the upkeep of water sources, veterinary services, and the provision of information, disintegrated. Together this led to a reduction in livestock mobility, which resulted in the overgrazing of pastures around *soum* and *aimag* centres and water sources. Despite this, there was a large increase in the number of animals due to the generally favourable weather conditions during these initial years of the transition. In 1990 Mongolia had 26 million domesticated animals; in 1998 this number had grown to 33 million – an increase of 27%.

The early signs of over-use of pastures in some places turned into a national disaster when weather conditions worsened at the end of the decade. Between 1999 and 2002, winter conditions were very severe and Mongolian herders and livestock were faced with consecutive *dzuds*, the Mongolian term for winters when ice and snow prevents the animals from foraging on the pastures. This resulted in estimated losses of 10 million animals nation-wide, and in December 2002 the total number of animals had gone down to 24 million; back to the level of the late 1980s (NSOM, 2003a).

Since 2002, weather conditions improved and livestock numbers increased again reaching 44 million by the end of 2009 (NSOM, 2009). However, from late 2009 to early 2010 Mongolia was hit once more by a severe *dzud*, exacerbated by a drought the previous summer. Eight million animals were estimated to have died, according to the Ministry of Food, Agriculture and Light Industry (SDC, 2010). Despite these large losses, the animal numbers after the *dzud* were still higher than those of 1998, which, at the time, were already considered to be beyond the land's carrying capacity.

Two other important developments that affect the livestock sector should be mentioned here. The first is the increase in absentee herders – often rich and Ulaanbaatar-based. Their large herds – sometimes exceeding 10,000 animals – roam the land, disrespecting local herders' customary use rights of the land. The growth in animal numbers since 2002 is thought to mainly stem from such large-scale operations. Second, is the increase in mining, both formal large-scale mining and the informal – often illegal – small-scale type. The former, while offering employment opportunities and an alternative to herding, has drawn criticism from herders because of pollution and destruction or depletion of water sources, land degradation through tracks, open-pit mining and dust pollution, and because of the general influx of people and small enterprises to mining areas. More and more herders – and not only the poor – are also involved in small-scale gold mining, locally called "ninja mining". While offering an alternative source of income, as well, problems with the theft of livestock and materials from winter camps, and damage of pasture have been reported (Schmidt *et al.*, 2009).

1.3 The GTZ Gobi project[2]

The project area is cantered around Gobi Gurvan Saikhan National Park ("The Three Beauties of the Gobi"). The project area, indicated in the map below, included 12 *soums* (districts) in 3 of Mongolia's southern *aimags* (provinces). Gobi Gurvan Saikhan is Mongolia's largest national park and was established in 1993 to protect globally endangered wildlife species, such as the snow leopard and the argali sheep, endemic flora, significant paleontological sites, and the unique desert ecosystem.

[2] The project description is largely based on Schmidt *et al.* (2009).

Figure 1: Location of the GTZ project area

The area's grasslands are dominated by low and highly variable rainfall conditions both spatially and temporally, which results in a so-called "non-equilibrium ecological system". In this type of ecosystem, pasture management is complex, and the main response to changing conditions has always been mobility. Changing weather patterns, related to global change as well as locally induced trends, further add to this complexity. Patterns of pasture management also depend on the geographical area and type of pasture and livestock. In the project area, three types can be distinguished: camel pasture, dominated by saxaul plants; grasslands for small livestock; and mountain pasture for horses and yak.

The GTZ project started in the area in 1995. In its first phase (1995-1997), the focus was on research and the establishment and training of Buffer Zones Councils around the park. The national park was established without much involvement of the local people, and the failure to invite active participation in decision making led to hostility from local communities and some representatives of local government. This persisted during the first project phase. Realizing that conservation was going to be impossible without a positive local attitude, the project began to take a new approach from 1998 onwards. This new approach involved participatory analysis and planning with local communities, local government and other stakeholders. Local people realized they needed to work together to coordinate their pasture use, and assist each other in herding tasks, moves, winter preparation, and in processing and marketing of the products they made. A key element of the project became the formation of community organizations of local herders and rural centre inhabitants that were based on customary institutions as much as possible. Using community organizations, the project aimed to improve cooperation and management between the local people, the park administration and local government, and through this attain better natural resource management, stronger conservation and improved livelihoods.

Good pasture management is vital for maintaining a balance in Mongolia's fragile semi-desert ecosystem. After the collective management during the Soviet era ceased, the responsibility for pasture management officially came to lay with the *soum* governments, but they did not take up the task with any zeal. The resulting lack of coordination and herders' desire to improve this, led the GTZ project to make community organization its main tool for achieving its goal of improving pasture conditions and halting further desertification. The

communities would be responsible to coordinate the pasture management in close cooperation with the local government and the national park administration, an approach called co-management.

For this strategy to work, and to make community organizations successful, the project devoted a lot of resources to the improvement of local capacity and skills. Trainings were organized to develop management, financial, and (participatory) planning capacity among all stakeholders, including herders, local government, and the national park administration. Community organizations, depending on their demand, could also learn practical skills for adding value to livestock products or diversifying livelihood strategies away from animal husbandry. Included among these were, for instance, trainings on dairy processing, felt making, meat processing, and the provision of tourism services. Care was taken as much as possible to train local trainers in order to build sustainable mechanisms for capacity development. Moreover, for all that was provided by the project, the communities were asked to contribute in some way, for instance by providing food and accommodation for the trainers. This was done to ensure that the communities were truly interested in the things they requested and to increase their ownership of the activities. Trainings were also provided on natural resource management and conservation. These trainings were given to all the stakeholders: protected area staff, government officials and community organizations. For the latter group, the trainings focused on pastureland management and wildlife monitoring.

The project provided material and financial support to the community organizations, the park administration and local government. This support included, among others, the provision of vehicles and field equipment for the park administration, community information and training centres to provide a physical place to meet, tools and equipment to complement the practical trainings, and educational material.

An important aspect of the project was the sharing of knowledge and experiences, both nationally and internationally. The successful initial community organizations hosted workshops to teach others. Representatives of the communities also participated in international conferences, such as the World Parks Congress in Durban in 2003, and in international organizations, such as the World Alliance of Mobile Indigenous Peoples.

When project funding stopped in 2006, 83 community organizations had emerged, involving 1,175 households, or about 14 percent of the project area's total number of households.[3] In some *soums* more than 20 percent of the households were organized. The table below shows the number of community organizations, and its member households, that were registered between 2002 and 2005.[4]

Table 1: Number of community organization registered (2002-2005) (Schmidt et al., 2009)

	2002	2003	2004	2005
Number of community organizations	51	66	79	83
Number of member households	658	880	1038	1175

[3] It was estimated in 2006 that approximately 75 percent of these communities were really active – with objectives and leadership, regular planning and with implementation of certain activities.

[4] As registered by local extension staff.

1.4 Methodology

Following the Positive Deviance approach of the overall TNC study, those *soum*s within the GTZ project area were selected with the highest density of still active community organizations, where the impacts of the GTZ-project were likely to be most pronounced. This led to the selection of the following *soum*s: Bulgan, Khangkhongor and Bayandalai *soum* in Omnogobi *aimag*; Bayanlig and Bayangobi *soum* in Bayankhongor *aimag* and Bogd and Baruunbayan-Ulaan (BBU) *soum* in Uvuurhangai *aimag* (see map below). All three major pasture and ecosystem types – desert steppe, saxaul areas, and mountain pastures – were included. Field work took place in the months of June and July 2010.

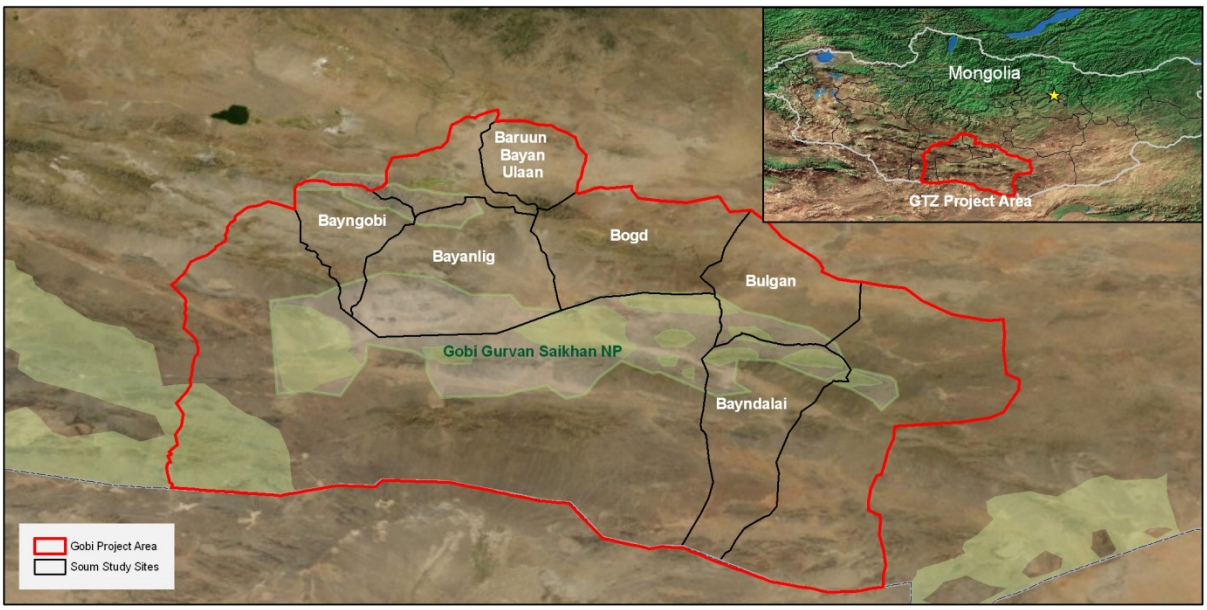

Figure 2: Map of Gobi project area and soums sampled in the study

Ecological assessment

The team used a Normalized Differential Vegetation Index (NDVI) to compare the condition of the grasslands of the community sites to non-community sites. Based on satellite data, NDVI is a measure of photosynthetic activity and can therefore be related to the density of aboveground biomass (Tucker *et al.*, 1985). With high-quality empirical calculations and a strong theoretical basis, it is especially useful for assessing the health and density of vegetation without complex classifications (Goward *et al.*, 1985, Sellers, 1985, Schimel *et al.*, 1991, Potter *et al.*, 1993). Characteristics of NDVI are typically as follows: bare soils have an NDVI between -0.1 and 0.1, with higher NDVI values occurring as the amount of green vegetation increases (up to 1.0 for a dense tropical forest) (Goward *et al.*, 1985).

By using a time series of NDVI observations, one can examine the dynamics of the growing season and monitor phenomena such as droughts and floods (Yang *et al.*, 1998, Peters *et al.*, 2002, Wang *et al.*, 2003), and anthropogenic cause related environmental change such as overgrazing and large-scale deforestation (Wang *et al.*, 2005, Kawamura *et al.*, 2005, Morton *et al.*, 2005). The strongest correlation between grassland biomass production and NDVI can be obtained by integrating NDVI over a relatively long time interval (Gu *et al.*, 2007). These results demonstrate that NDVI can be used directly in landscape-scale models of Net Primary Productivity (NPP) for grassland ecosystems (Wang *et al.*, 2005).

NDVI can be determined using the older, lower resolution Advanced Very High Resolution Radiometer (AVHRR) sensor for pre-2000 statistics, and the newer, higher resolution Moderate Resolution Imaging Spectroradiometer (MODIS) sensor for post-2000 NDVI statistics. Both have demonstrated the ability to estimate total and live biomass, and can reliably detect the phenology and forage quantity and quality of grassland steppe areas (Zhang *et al.*, 2003, Kawamura *et al.*, 2005a). NDVI has been used to study restoration changes of grazing in grasslands (Wang *et al.*, 2008), and there is also evidence that grass growth correlates strongly with greater biodiversity in equilibrium grassland ecosystems (Guo, 2007).

This methodology uses long-term seasonal NDVI statistics to compare the habitat condition of a conservation site against field-calibrated control sites. Summarized bi-weekly NDVI statistics are gathered over a certain time span for each site: in this study: 1982 – 2006 using AVHRR data and 2000 – 2009 using MODIS data. The statistics are summarized to produce average seasonal NDVI characteristics and a Time-Integrated NDVI (TI-NDVI = summed growth season NDVI) for both the conservation and control sites. Seasonal growth NDVI statistics (see Figure 3) can show differences in growth patterns. Differences could be as follows: the time of onset of greening up in spring (when plant growth starts), the rate of greening up in the spring (how quickly the plant-cover recovers from winter), the maximum NDVI (the greatest amount or density of summer growth), and the length of the growing season (duration from onset to senescence in autumn). These statistics of the growth season, when combined and compared (community vs. non-community), could be indicators of a more robust and healthy grassland ecosystem. Time-Integrated NDVI (TI-NDVI) statistics indicate the yearly seasonal-growth summed NDVI results (see Figure 3). This statistic is strongly correlated with above-ground biomass for each season (Tucker *et al.*, 1985, Wessels *et al.*, 2006), which, in grasslands, is an indication of the relative amount of forage available. Bi-weekly NDVI Means can also be compared with precipitation to pin-point times of drought or high rainfall – which is especially important in very dry regions.

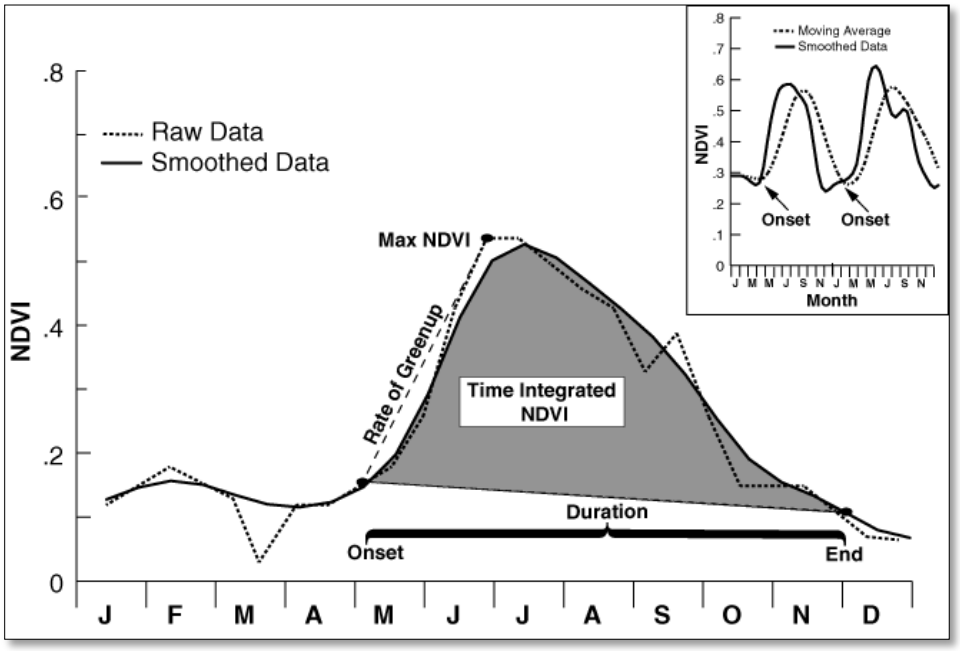

Figure 3: Seasonal Characteristics of NDVI (Green et al., 1994)

For a meaningful comparison, control sites should have similar habitat features as the community conservation areas. The number and location of the data points are defined by the different macro habitats that occur in the

conservation area – usually delineated by differences in rainfall, elevation and possibly soils if detailed enough data exist.

Data were collected in the field (with GPS locations) for multiple sites (see Figure 4), both inside the conservation area and from control sites nearby. The minimum area needed for this type of analysis is determined by a combination of the resolution of the satellite data and local variation of the habitat. To minimize local variation and adequately reveal the underlying pattern of NDVI, it is best to average adjacent pixels (Wang *et al.*, 2005) – e.g., a 3x3 or larger pixel area is ideally required. For the moderate resolution MODIS sensor data (250 meter x 250 meter pixels), a 2.25km x 2.25km area was used (a 9x9 pixel area, 81 pixels in total), thereby obtaining a more accurate reading of the underlying NDVI of the grassland. For the low resolution AVHRR data (8km x 8km pixels), single pixels were used, as they covered each grazing site completely, and multiple pixels would cover more than one site. The error that might be introduced by using single AVHRR pixel data is offset because the data are already summarized from the original 1km and 4km spatial resolution data (Tucker *et al.,* 2005). Individual site selection was determined by local community coordinators. Each coordinator was instructed to position the team at the centre of the grazing areas –whether they were the community or non-community areas. A detailed description of the individual steps taken in the analysis is provided in the appendices.

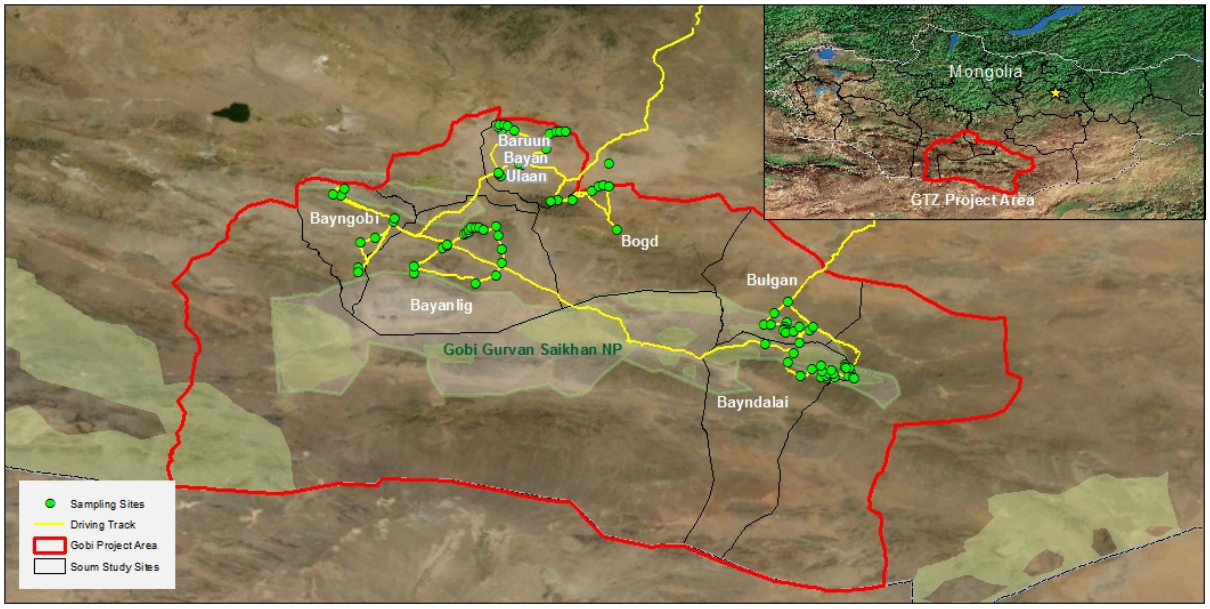

Figure 4: Ecological sampling sites

Socioeconomic assessment

The effects of the project on poverty were determined by looking at several dimensions. Following the World Bank's definition of poverty, the three different dimensions of poverty were subdivided into a number of indicators that are presented in Table 2. The indicators were taken from van Beukering *et al.* (2007) and adapted to fit the local circumstances. The presentation of the socioeconomic results follows the structure of this framework.

Table 2: Poverty indicators

OPPORTUNITIES	EMPOWERMENT	SECURITY
Income	Governance mechanisms	Health
Alternative livelihoods	Community participation	Social cohesion
Livestock (management)	Benefits to ♀	
Pasture management		
Access to credit		
Housing		
Durable goods		
Education		

The indicators were assessed by using both qualitative and quantitative methods. This offered the benefits of both approaches: the deeper, contextualized information that one-on-one interviews and focus group discussions provide, and the numbers that can be compared through statistical analysis.

The qualitative analysis consisted of 31 semi-structured interviews with key informants, such as government officials in different positions, community organizers,[5] community leaders and people from the national park administration. The questions for the interviews are provided in the appendices. Eight focus group discussions were held with members of mostly GTZ-organized herder community organizations.[6] Again, both the protocol for the discussions and an overview of locations and participants are provided in the appendices.

A household survey was held to provide data for the quantitative analysis. The questionnaire for the survey was developed in the spring of 2010, after which it was translated in Mongolian and further discussed and amended with the help of local experts in Ulaanbaatar. The questionnaire was finalized after two rounds of pre-testing in Khankhongor *soum*. The survey team consisted of experienced interviewers, many of whom were familiar with the study area. The questionnaire can be found in the appendices.

A sample frame for the survey was drawn up by collecting population data on *soum* and *bag* (sub-district) level. In cooperation with local government officials and former community organizers, herder households were selected that were members of still-active organized communities. As another prerequisite for selection, the herders had to already have been herding in the *soum* in 2002, the year in which community organizations took off, to ensure they would be aware of the changes that had taken place. As mentioned above, the area largely has a non-equilibrium ecosystem, in which the weather is the main determinant for grazing conditions and therefore has also has a large impact on herders' year-to-year income. Because the weather can also differ significantly on a local scale, it was decided that the control households would be selected from the same *soum*s as the target households. This ensured that the target and control households had faced similar weather conditions. It meant that the geographic element of market access – distance to markets – was automatically controlled for as well. The draw-back of this approach is the possible influence of target households' behaviour and pasture management practices on the control group, potentially making the comparison biased.[7] To limit

[5] Community organizers were part of the project staff. There was one such person in each *soum*, and their role was to visit and stimulate the communities and act as a liaison between them, local government, other stakeholders and resource agencies, and the rest of the project team.
[6] The GTZ project also supported community groups in the *soum* centers, but these were excluded considering this study's focus on grasslands.
[7] For a discussion of this problem see Glew *et al.*, 2010: 11.

this influence, households that had winter camps and pastures closest to those of the community member households were excluded from the sample frame. To match target and control households on socioeconomic characteristics at the start of the project, all households were divided in groups based on the number of animals they owned in 2002. This division was based on the official welfare grouping used by government.[8] After the sample of community households was drawn, the shares of each welfare group were matched in the sample of control households.

Some of the effects that will be discussed in the empirical analysis were also influenced by projects that operate(d) in the area after GTZ left. Among the organizations active in the region are SDC, JICA and the World Bank. This could be seen as leading to a bias in the results, as the measured effects cannot be attributed solely to the GTZ project. However, the main element of the GTZ project—around which this study is centred—is the community organizations. The GTZ Gobi project pioneered this approach, and it has been largely adopted by the projects that came after. The uptake of its strategy by other organizations is not only a sign of success, but also a direct impact of the project. More so, the GTZ project trained the communities in writing project proposals which helped draw donor money to the area. It is, therefore, felt that the impacts found in this research can largely be attributed to the GTZ project and its strategy to help develop and work with community organizations.

[8] The grouping divides households in 5 categories ranging from very poor to rich. Officially, more variables than just livestock numbers are used, but this was the only variable generally available for 2002, and is considered very important. The groups are: Very poor: 0-50 animals; Poor: 51-100 animals; Average: 101-500 animals; Better-off: 501-1000 animals; Wealthy: >1000 animals.

2 ECOLOGICAL ASSESSMENT

2.1 Seasonal Growth Curve Comparison (2000-2009)

A clear difference between the community-managed areas and non-community land can be seen for the average seasonal growth (see Figure 5). An NDVI threshold of 0.12 was used to test the difference.[9] The length or duration of the growth season was longer in the community-managed areas (~18 weeks vs. ~12 weeks), allowing for a longer grazing season for livestock. The timing of the start of growth and rate of green-up is also important. The green-up of the community sites occurred earlier and faster in the spring (by about 6 weeks), allowing for livestock to recover quicker from the winter. Lastly, the peak growth of grass in the conservation areas was higher (the maximum NDVI is 21.3 percent greater). This means that plant growth was denser: there was more forage available for the livestock. On average, the overall NDVI for community sites was 11 percent greater than in non-community areas with most of the difference occurring in the growth season. The grasslands were therefore denser throughout the entire year.

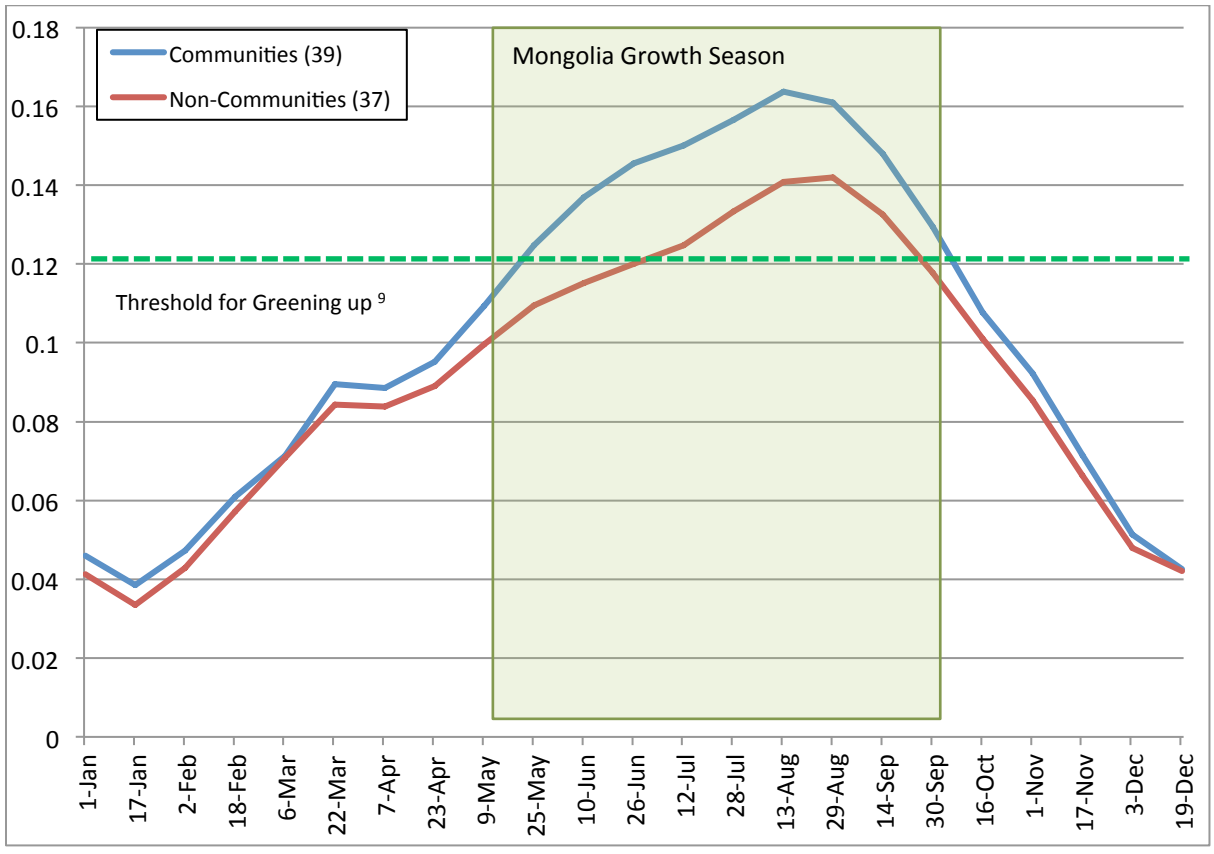

Figure 5: Ten-Year Seasonal Growth Curve Comparison (NDVI)

[9] An NDVI of 0.1 has no or very little photosynthetic activity, so above that point (*i.e.*, 0.12) some plant growth has occurred.

2.2 Time-Integrated NDVI (Sum of Growth Season NDVI) (2000-2009)

For all years, community sites had a higher Time-Integrated-NDVI than the non-community areas. Time-Integrated NDVI (TI-NDVI) is the sum of the NDVI for a year, or in other words, the yearly growth of a site. On average, community sites had 15.5 percent more biomass than non-community sites. This extra biomass is directly correlated with an increase in forage for livestock. There is also a difference when comparing years that are above the average TI-NDVI for the study period to those that are below (averages of 115.8 and 100.4 for communities and non-communities respectively). For the below-average years, community grazing sites had a higher ratio of growth than non-community sites when compared to above-average years (an average of 16.4% vs. 14.6%). In other words, in drought years, there was comparatively more biomass for communities than non-communities, than in high growth years. This translates to community organization members having an increased chance of surviving drought years than non-community members.

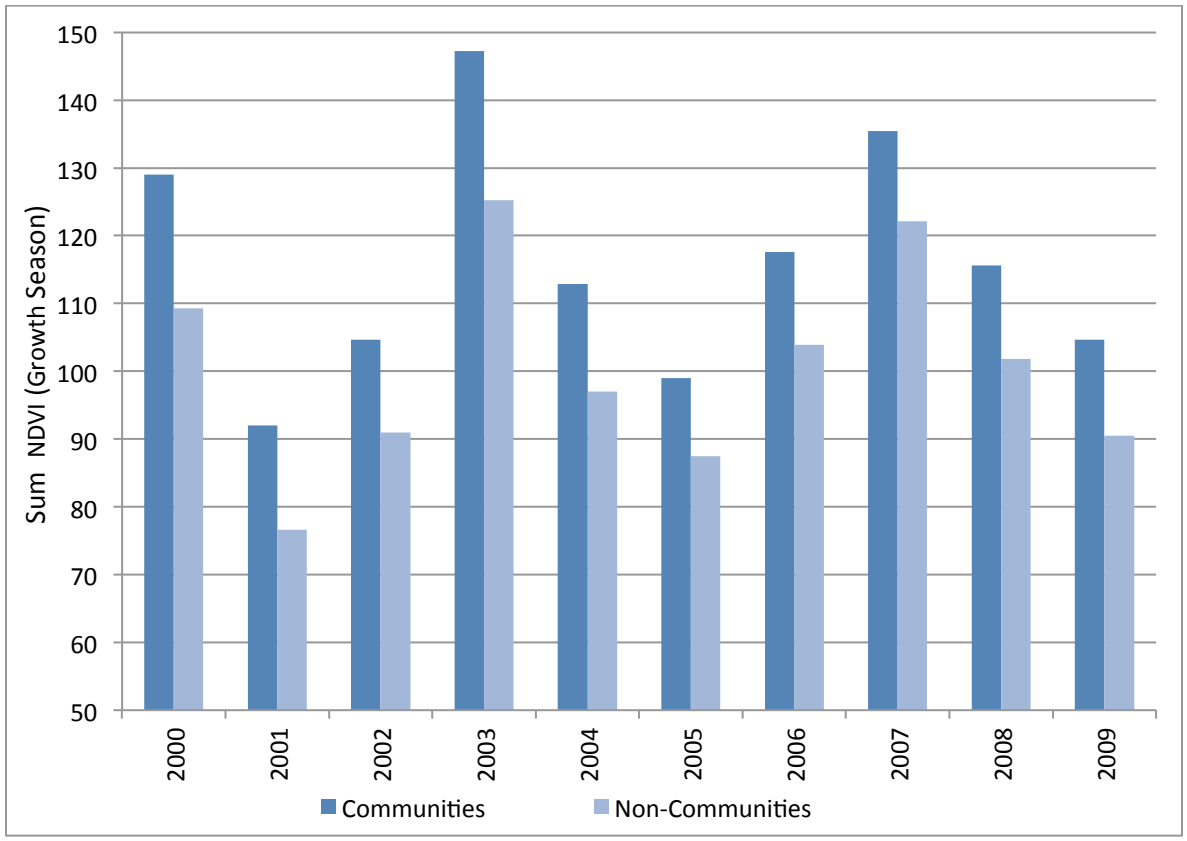

Figure 6: Seasonal Biomass Growth (TI-NDVI)

2.3 Advanced Very High Resolution Radiometer Seasonal Growth Analysis (1982-2006)

According to rainfall statistics, the 1990s were a decade of relatively high rainfall (on average 15 percent higher than the preceding two decades), with fewer drought years (rainfall below the 26-year average) than the previous and following decade (1980s = 5, 1990s = 2, 2000s = 7) (see Figure 7). Interestingly, the overall trend for rainfall over the 26 year period remained virtually flat (y = -0.0339x).

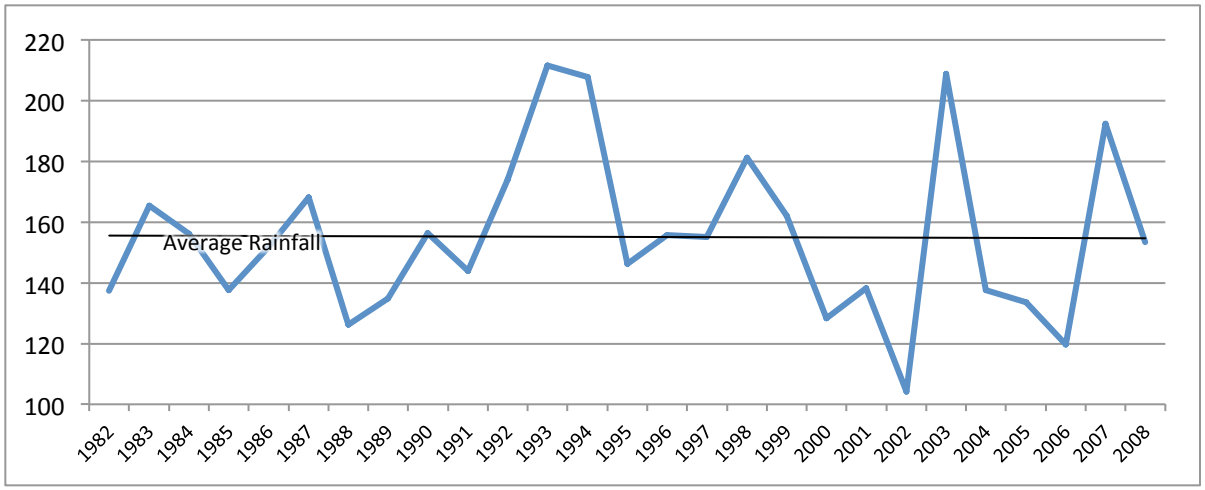

Figure 7: The region's rainfall per year in mm (1982 to 2008)

Rainfall has a strong correlation with the rate and quantity of plant growth. The high rainfall in the 1990s led to a higher seasonal NDVI in that decade compared to the decades before and after. This can be seen in the NDVI seasonal growth curve for in Figure 8. For all sites (community and non-community sites combined), the growth season NDVI for the 1990s was 16.5 percent higher than for the 1980s and 9.2 percent higher than for the 2000s. It was fortuitous that the 1990s was a high rainfall decade, given the disorder in grazing management that ensued after Soviet control ended in 1990.

But did community member grazing sites actually benefit from the conservation strategy, or were they always better off in terms of plant growth? Comparing the community member sites against the non-member sites pre- and post-conservation intervention (grazing management and pasture conservation) shows that in the 1980s, the community member sites had a slightly higher (1%) average growth season NDVI than the non-member sites, and maximum NDVI was the same. In the 1990s, the community member sites had a slightly lower (1%) average growth season NDVI than the non-member sites. Maximum NDVI for non-members was 4 percent higher than community members. However, in the 2000s, after the conservation intervention, the community sites had an average 5 percent greater growth season NDVI than the non-community sites.

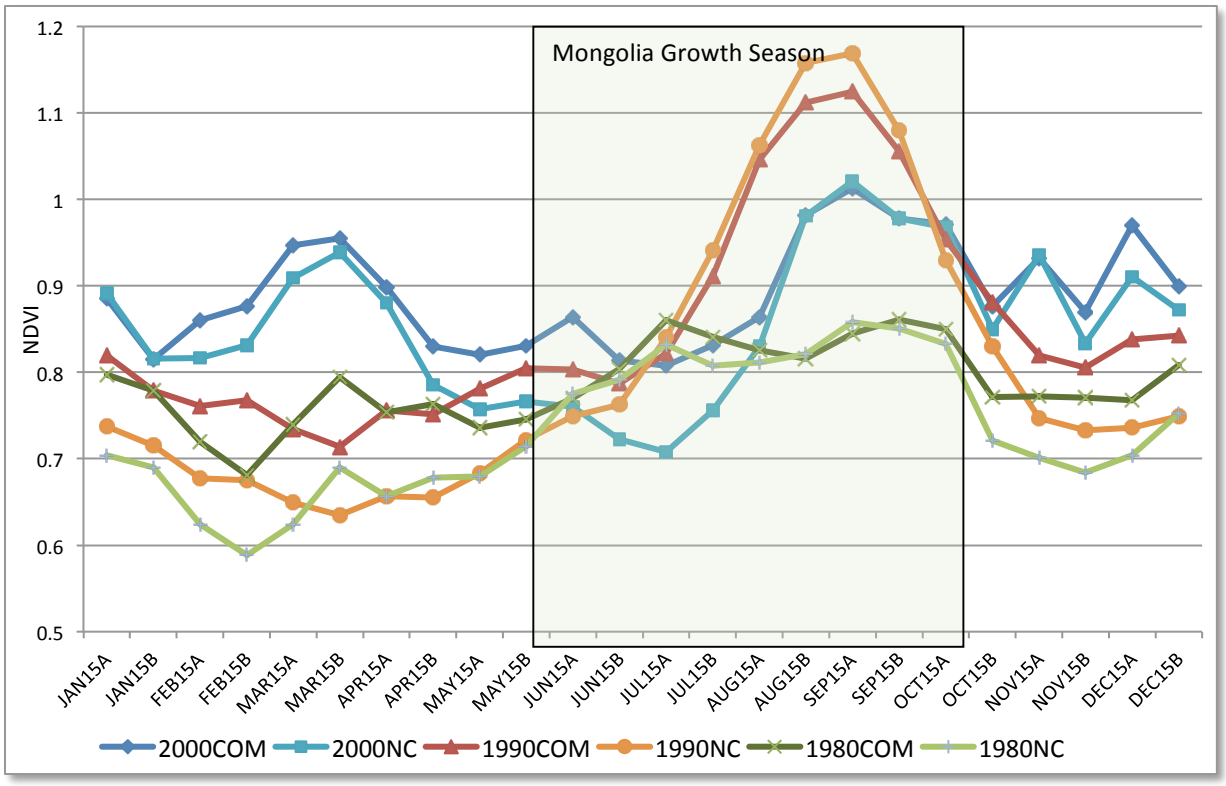

Figure 8: 24-Year Bi-weekly Seasonal Growth Curves (grouped by decade: 1980s, 1990s, 2000s)

2.4 Advanced Very High Resolution Radiometer Time-Integrated NDVI (1982-2006)

The yearly growth-season TI-NDVI was similar for both communities and non-communities for the period 1982 to 1999 (pre-conservation) – the average TI-NDVI for that period was within 0.5 percent of each other (non-community sites trending slightly higher over time). However, in the 2000s, the community sites had a 6 percent higher TI-NDVI than non-community sites, and reversed a trend over the previous two decades.

It could be argued that drought years are when the conservation intervention becomes more relevant to those communities involved, because in terms of forage, drought years are when livestock are in most peril. Rather than using average rainfall, which is unevenly distributed in the Gobi and can bias results, drought years were identified as a year where annual TI-NDVI was below the three decadal average for all sites.[10] On the whole, for all three decades, low TI-NDVI years were the same for both community and non-community sites. For these low NDVI years, the difference in TI-NDVI between community and non-community areas is even greater. During the two decades before the conservation intervention, both the community and non-community areas had almost the exact same TI-NDVI (within 0.02%). However, after the conservation project was initiated, the community sites had a 14 percent higher TI-NDVI, compared to the 6 percent difference found for all years. The higher TI-NDVI equates to more biomass (forage) for livestock during difficult years and the ability to survive a drought in better condition than the non-community member livestock.

[10] The drought years can be found in the appendices.

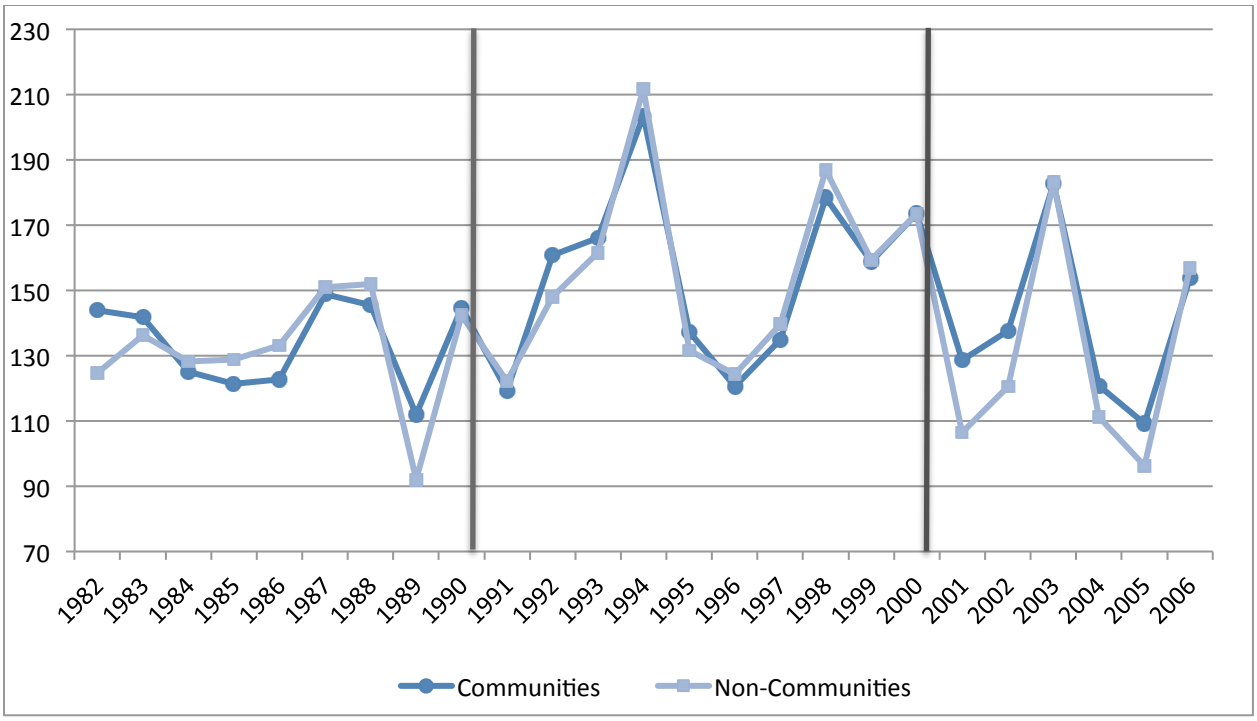

Figure 9: 24-Year Advanced Very High Resolution Radiometer TI-NDVI: Sum yearly growth season (1982-2006)

2.5 Summary of ecological assessment

The grass on community managed areas, on average, had a longer growing season, with earlier and faster green-up in the spring, and a higher peak growth between 2000 and 2009. Over the whole season, this meant community members had 15 percent more biomass available on their land than there was on the pastures managed by non-members. The long-term analysis showed that overall plant growth in the 80s and 90s was almost identical in both community and non-community sites, ruling out inherent differences between them as a cause for this finding. The long-term analysis also showed that after the conservation program started, during drought years, there was more forage available for community sites, meaning an extra benefit to community members during difficult times. The grazing management practices put in place (*e.g.*, joint grazing rotation between winter and summer pastures, which allows recovery of the grassland during the "off" season) have been shown to have a beneficial effect to the grassland condition. The ability to reduce stocking levels by selling off excess livestock, especially during drought years and substituting with other additional sources of income (*e.g.*, tourism and selling vegetables) would have a similar effect on the grasslands.

While it has been shown that the community-managed rangeland is in better condition than that managed by non-organized herders, assessing any improvement to biodiversity is more difficult. To accurately do so would take an in-depth study of many months, and require a pre-conservation intervention baseline to be measured against (which is only available for a few species in the national park). However, one can argue that the increased availability of natural forage for livestock also means an increase of forage and cover for antelope and small herbivores (*e.g.,* pica), which would in turn, benefit predators (*e.g.,* raptors). Other studies have shown that in stable grasslands, increased grass growth equates to increased grassland species diversity (Gou, 2007). While in the field, it was noted from personal observation, that arid bird species abundance was

generally higher in areas of greater grassland density (and most often occurring community sites). For other natural, non-grassland habitats found in the region, such as the saxaul plants, there also seems to be a recovery underway. The saxaul plants, which are found mainly in the western parts of the study area and are a source of firewood, have been recovering. However, this recovery is probably due to a combination of both technological advances providing an alternative for heating, such as coal, gas and electricity, and conservation efforts.

3 QUALITATIVE ASSESSMENT

3.1 General impressions

In general, all participants in the study were very positive about the project. Several respondents said that the project *"opened our eyes and brought us back together to share labour, worshiping, happiness and sorrow"*. However, it also became clear that since termination of the project in 2006, there has been a relapse in the impacts of the project, and the project's core strategy of establishing community organizations for better natural resource management, stronger conservation, and improved livelihoods has not been fully sustained. Only about half the community organizations were still operating four years after the project ended. Local perceptions are that a changing climate, becoming dryer with more frequent *dzuds*, has led to increasingly difficult grazing conditions. The 2009-2010 *dzud* made many herders leave their normal grazing grounds on long treks (*otor*), or even made them give up herding altogether and move to Ulaanbaatar or one of the *aimag* (province) urban centres. Government support for community organization has also declined after most of the government officials who were actively involved by the project were replaced after elections. *"Out of the 80 communities established in the Gurvan Saikhan National Park, around 40 communities still exist, but they are often not active"*, said the former park director.

Even though the number of active community organizations has declined, those that are still active have experienced many positive effects from the project. The most noticeable benefits have been in the areas of alternative livelihoods,[11] improved social cohesion and governance. Seasonal movements and hay production are also examples where improvements were achieved.

3.2 Opportunities

Income and alternative livelihoods

The project's direct focus on livelihood improvement and diversification came about from the realization that conservation would be impossible without the support of the local herders. But this was not just a way to win them over. In the project's strategy, reducing livestock dependence would lead to people moving out of herding, or to earning more income from fewer animals, and would therefore lead to reduced grazing pressure on the pastures.

Income generation was generally seen as an important motivation to be part of a community organization. In almost all focus group discussions, increases in income were mentioned as an important impact of the project and community organization. These increases were mainly possible because of the alternative livelihood trainings that GTZ organized for the community organizations. The project made people *"aware of income sources other than livestock"*. Herders also said, *"The trainings have improved our lives and our living standard"*. The products that community organizations still sell after having followed GTZ trainings are felt products, dairy products (milk, yoghurt, cheese, ice-cream, sweet cream), souvenirs, cookies and other

[11] Included here under 'alternative livelihoods' are the new income-generating activities that are related to livestock rearing, such as further processing of animal products, which are therefore not completely 'alternative' to the traditional herding activities.

pastry/baking products, sausages, boots, belts and other leather products, yarn and other wool products, fresh and preserved vegetables, furniture, medicinal teas, building blocks from cement, and fuel briquettes. The project also taught community organizations how to make labels with product information, and good and attractive packaging, which allowed them to charge a higher price, make their products last longer, and position themselves in the market with their community product brand name. Those who can travel to the *soum* or *aimag* centre or the Chinese border to sell their products were said to have increased their income a lot.

Income increases also came about from the project indirectly. For example, one community organization mentioned that the government helped communities to get in contact with wholesale buyers, so they could sell collectively. Increased market access was often mentioned as a benefit by the community organizations. However, many also mentioned that this 'bridge' stopped after the project ended, because contacts had not been properly handed over to the community organizations.

Besides the activities related to the further processing of animal products, vegetable growing was one of the alternative activities that was much appreciated by the herders. Even the otherwise inactive community organization that participated in one of the focus group discussions mentioned that vegetable growing was the one activity they had kept. Some vegetable growers moved it to a higher level. One community organization had started a community institution, which allowed scaling up and selling collectively to wholesale buyers. Another had registered its businesses with the Mongolian Chamber of Trade and Commerce.

A further non-livestock related income source was tourism. GTZ funded the participation of herders in international meetings of pastoralists and communities engaged in conservation, tourism and food production. These included meetings to Africa to learn how to start a tourism business. Some of the businesses that started as a result of this continue to be successful. Several community organizations rehabilitated an historic site in cooperation with the local government and charged fees to tourists, which are shared between the communities and the government.

The increase in income has not always been permanent, and as a lot of it is related to animal products, offers little respite when severe weather diminishes livestock. For instance, in one focus group discussion in Bulgan, people said they used to work together with a tourist camp, providing meat and milk, but due to droughts there were too few tourists and their contract was ended. The latest *dzud* also strongly affected many of the new income sources. Many communities mentioned that the *dzud* had killed much of their livestock and weakened the rest. They have had very few offspring this year which meant less milk to process and sell. *"The alternative livelihoods offered by the project couldn't compete with the disastrous effects of years without good rain.*" Also the other animal products, such as wool, cashmere and skins, have declined in volume and quantity, so that little was left to process and sell or use. Others said, *"We have a better life, but it is still hard to cover all the daily expenses*".

One important development that was often mentioned by the key informants – but not by the communities themselves – is that in recent years illegal gold mining has become an important income source. Many herders who lost much of their livestock in the last *dzud* were driven to this so-called 'ninja' mining. Cashmere, which has always been the main "cash-crop", was also mentioned to have become increasingly important as an income source. Compared to these two main income sources, the extra income generated from GTZ alternative livelihoods is small, though appreciated by the herders.

Livestock management

The focus on further processing of animal products was one way to let incomes increase while reducing the number of animals and general grazing pressure. Improving the quality of people's herds was another part of this strategy. The project organized trainings to get the message across that having a large herd was not necessarily better than having fewer, but better-quality animals. It, moreover, helped to provide high-quality breeding stock. In the focus group discussions, it was clear that most communities had become more aware of the importance of this message. Key informants mentioned that it had actually resulted in less livestock in the past few years. One community set a limit on the maximum number of animals per household, because "*if people have too many animals they don't have time for meetings, and if members have a large herd, more animals will die in a dzud anyway*". This community has also kept up the practice of buying high-quality breeding stock. Others, however, said that "*during project time there was a breeding program and GTZ brought in sheep and goat males from far but this has stopped because herders don't have the money*". They said they now only exchange animals in their own *bag* and *soum*, but that this does not provide the change in genes that avoids inbreeding.

Veterinary care is another important requirement to have high-quality livestock. Tsaagan Nuur community members said that the project taught them to give their livestock regular veterinary treatment and vaccinations. One veterinarian who used to be a community organizer for the project said that communities have better access to veterinary service, but that this also came about through the JICA 'healthy livestock, healthy food' project. Another vet in the same area said he had as many community members as non-members among his clients, and there was no difference in this respect.

One *soum* governor said the following: "*After the 2000 dzud, people concentrated on livestock quantity, but after the 2009 dzud, people realized that they lost animals again and it's better to concentrate on quality, not quantity. Both from their own common sense and from GTZ project trainings they realized that it saves costs to have fewer but better animals that give more milk and cashmere.*"

Pasture management

Besides the aim to reduce the total number of animals, improving pasture management was an important focal point of the project. A vital element of good pasture management is rotational grazing and the seasonal moves to different areas. In general, the community herders all learned from the project trainings that rotational movements should entail more than the few kilometres they moved before, and that they needed to leave a pasture all at the same time to allow it to rehabilitate. A *bag* governor in Bogd said that *"pasture management has improved in the bag because the communities teach others and share their experiences to preserve the pastures and understand why it's important to not use certain pastures."* However, this does not seem to be generally true anymore, and depends on whether communities managed to remain active under the current harsher conditions. One of the communities that participated in the focus group discussions said the project had had no lasting effects on pasture or livestock management. A community leader in Khangkhongor *soum* said that the effects of their improved pasture management activities on the quality and density of the pastures continued for two years after they started with their activities, but it did not last because of a lack of rain and overgrazing. Among the positive stories, Bayndalai herders said they used to move only 10 kilometres around their winter camp with their livestock. After project trainings, this distance increased to about 40 kilometres. The communities there also more often reserve winter pasture than in the past.

One community leader mentioned that in the past the community had made it easier to go on *otor* – the long distance trek to good pastures with the large animals in the autumn to strengthen them for the winter. Some community members would take all the large animals in the herd, while others stayed behind with the small animals and took care of the vegetable plots. In only half of the focus group discussions it was said by the participants that they still went on *otor*.

Several communities started to fence off areas to let the pasture recover or start collective hay production. Only 2 out of the 13 communities that participated in the focus groups have successfully continued processing hay together and four have continued to fence off pastures. Holding this back is the lack of financial means and materials to fabricate the fences. Insufficient water and the generally dry soil and climate are other reasons given why hay making failed or was not undertaken.

Another vital element of pasture management is the upkeep of wells and natural water sources. A good pasture is useless unless there is a nearby water source where the animals can drink. Almost all participating communities in this study have undertaken activities to clean up their water area and to protect streams and other natural water sources. Many communities have also dug wells, sometimes in cooperation with the local government. During the project, communities in Bulgan built an eight kilometre long irrigation system for the pastures, which was partially financed by the community fund. Zuun Bogdiin Uguuj community in Bogd redirected a river back to its original flow.

Finally, when asked if the project had generated any visible effects on the pastures, a respondent answered: *"these days, there has been a little more rain and people sometimes have less livestock"*. Another respondent said that *"the project did a lot to improve pasture management, but there are no visible results on the quality of the pasture because the State government allowed the land to be used for mining."* This reflects the general notion that the weather and government decisions had an influence on the pastures beyond the impacts of the GTZ project that were discussed above.

Access to credit

The GTZ project affected herders' access to credit in a number of ways. The project set up Buffer Zone Councils around the park that were supposed to help draft management plans for the zones. These councils were provided with seed-funding by the project and local government to provide credit, for instance to traders or community organizations. Community organizations were encouraged to set up community funds from which micro-credit could be provided to members. Community members contributed in-kind or in cash. About one third of community fund received a contribution from the project to keep a "risk management" fund within their community fund. This contribution was dependent on a risk management and preparedness plan and co-funding to be provided by the community.

However, these sources of credit seem to have largely dried up since the project was terminated in 2006 and emergency purchases of hay and fodder during last year's *dzud* emptied the community funds. What has happened to the Buffer Zone Funds is unclear. The communities mentioned that credit from the funds had stopped after the project ended,[12] but the last evaluation of the project by GTZ itself in the autumn of 2009 showed that the funds had actually grown (Schmidt *et al.*, 2009). Two key informants – and one himself a Buffer Zone Council member – in one particular area mentioned that the Buffer Zone Councils in the area still

[12] Similarly, they said loans from the environmental protection councils, which operate in *soum*s that do not fall within the boundaries of the park, had stopped in 2008.

provided loans to communities, that there was a lot of money in the fund, and that regular reporting to the communities took place. However, the communities of this same area did not mention any benefits from the Buffer Zone Fund, and a community leader said no more loans have been given, and they did not know where the money had gone.

Of the thirteen communities that participated in the focus group discussions, only two still had a well-functioning community fund that had sufficient funding and was actively reporting to community members. Besides being emptied to buy hay and fodder during last year's *dzud*, the community funds also lost money because micro loans to members were not repaid, which was also related to the impacts of the *dzud*. *"We used all the money to buy fodder and hay during the dzud and now there is nothing left. We don't have the money to start again"*. Another reason that was often mentioned was *"We used to have much money in our account but we don't know what has been done with it or where it has gone."* indicating that the funds may not always have been managed well.

An indirect way in which the project has influenced the access to credit for community organizations has been the adoption of the project's community approach by other donor projects. Some projects that provided (micro) credits, such as the World Bank Sustainable Livelihood Project and the Japanese Healthy Livestock, Healthy Food Project, would only work with communities, which thus helped the already-organized GTZ-communities.

Education and capacity development

When asked about education, most respondents mentioned knowledge and skill development of herders as a result of the GTZ trainings. Only after specifically asking for impacts on children's education a few respondents could mention some impacts, but this indicates that this was not an area where the project had its main impacts.

One of the effects mentioned was that community members have become more aware of the importance of education as a result of the alternative livelihood trainings. More children now go to kindergarten in the *soum* and *bag* centre. In one community, the members bring their children to community meetings, where they learn about nature conservation. The project also initiated so-called Ecoclubs in schools which aimed to increase the ecological knowledge of youngsters. Few of these seem still to be active due to a lack of resources after the project ended, but those that are, make information boards, take children out into nature and include kids in pasture and wildlife monitoring.

Other effects mentioned were that school drop-out rates had decreased (in Bayndalai), and that retired school teachers had been involved by the project to help children who had skipped school to take care of animals learn how to read (in Khangkhongor). In the latter *soum*, the youth had also participated in some of the projects workshops and many still practiced other activities besides herding. *"The youth have a better livelihood because of the project, because they don't know how to herd but do know other things now"*. In Baruunbayan-Ulaan *soum*, the community decided together what would be the best study choice for the youngsters.

Because community herders also teach their children what they have learned, lasting impacts of community organization and the GTZ project can be expected in the future. However, one of the facilitators said, *"The project improved the awareness of education, but resulted in people moving to the aimag centre to school their children and this causes communities to fall apart"* showing that it can sometimes be difficult to reconcile the different dimensions of development.

Another GTZ activity that was highly appreciated by the herders was the organization of study excursions and participation in international events abroad. By connecting the herders to international institutions they learned how communities abroad worked together and how pasture management could improve if people work together as a team. This revealed very valuable information to the herders and gave opportunities to share experiences. One of the results today is that some of the community leaders and members participate actively in the World Alliance of Mobile Indigenous Peoples. A former community leader in Khanghongor is a member of the international council of the alliance and was planning to start a Mongolian chapter of this institution to unite Mongolian herders and exchange ideas.

Environmental awareness

Many communities, especially those around the national park, have cooperated with the rangers to help them monitor wildlife, such as Argali sheep and Ibex goats. One community said that they were able to stop poaching in their area entirely. However, most communities complained that the rangers have stopped communicating with them and so they stopped with this activity. Despite the discouragement, herders did say that their attitude towards wildlife conservation has changed and they have become proud of their wildlife.

During the project, many communities planted trees to combat desertification and keep the soil of the community crop land moist. Most communities, however, explained that the trees had died because of drought and a lack of knowledge on how to plant trees. They often planted the wrong types that did not survive the harsh Gobi climate. A successful attempt was made in Khangkhongor, where a second motive was to later use the wood. They also started protecting bushes from being cut. *"Even non-community members are now afraid to cut trees"* said a community leader there. In Baruunbayan-Ulaan *soum*, the communities and *soum* government have started a tree plantation, which the caretaker proudly showed to be in fine condition. Following their training by the project, Bichigt community in Bayanlig still makes briquettes from coal dust and animal dung, which can replace fire wood and bushes as fuel.

A few communities mentioned that they have been rehabilitating mining sites. The miners dig deep holes and tunnels in the soil to find gold. Livestock fall into these holes and the pastures become inaccessible to herders. The herders expressed that it is very hard to make the miners listen to them and they always refuse to close their holes; that is why they started to do this themselves.

Finally, especially current and former s*oum* governors mentioned improved waste management by communities as very beneficial to the entire *soum*. Many communities have cleaned areas from rubbish, and made waste processing more organized; toilet areas have been cleaned and road maintenance performed collectively. "*GTZ donated a donkey for gar*bag*e transport, the government arranged a location, the national state pushes people to pay for rubbish transport and the communities collect the garbage. This is a win-win-win situation for all involved."* It was observed by the researchers in Bulgan that all herders, not only those from communities, collectively cleaned the litter after a *Naadam* festivity, picking up even the smallest plastic wrappers.

3.3 Empowerment

Governance mechanisms

The project promoted democratic processes in the community organizations. Community leaders were elected, and herders chose their own roles in the community. The GTZ project trained facilitators to show herders how to hold meetings and enhance equal participation. The project also pushed for legal recognition of the communities, in which it succeeded. The *Nukhurlul* (the name given to themselves by the early herder communities in the Gobi) were accepted as rural civil society organizations in the civil code following the initiative of a South Gobi member of parliament. This allowed contracts, for instance, on communal land management, to be made between local government and the communities, and gave the communities legal rights and obligations.

The relationship with the local government improved for some communities. Mongolians are a naturally shy people, as respondents phrased it, but during the project they learned to express their opinion, have discussions and talk to the governor. They learned to have a stronger voice. Many of the active communities were able to make the *soum* governor listen to them and they managed to influence, for instance, pasture management plans and social events. *"Government policies and plans are more community oriented instead of individual household oriented",* said a *soum* governor. Several government officials mentioned that it has become easier for them to reach herders as they now only need to contact the community leader instead of individual households. Regarding the last *dzud,* a former *soum* governor related this: "[…]*non-community members had to gather hay on their own, but community members were able to ask the governor for hay and he delivered it to them. They repaid from the community fund or later when they had sold their cashmere or wool*". It has also become easier for the communities to receive news from the government, for instance on changes in the law. Some communities started to read the *bag* law together. Some of these statements could raise the concern that community organization had a disenfranchising effect on herders who were not organized. The original aim and hope of the project had been that community organization would showcase its benefits to all, so that in the end all herders would be organized.

Not all community organizations shared the opinion that the relationship between government and organized herders had improved. Some said they did not know their governor and he never supported them. This was partly blamed on how all government officers are replaced if the opposition wins at elections. After the project's active involvement of local government stopped with its termination, newly elected officers had little knowledge of or experience with community organizations.

Besides the changes in communication, local herders appear to be able to take more actual part in government, as one person in Khanghongor *soum* explained: in elections for the local *khural* (parliament), people for the new administration used to be automatically appointed. *"These days herders can get elected"*. While there are indeed some cases of community members taking up local government positions, this was apparently not enough to ensure that cooperation between government and communities stayed at the level it had reached at the end of the project.

The project also, cautiously, supported experiments with new ways of communal land management. Land possession in the Gobi is difficult, because a climate with irregular rainfall requires long treks and sharing of land, which can be more difficult under formalized tenure. Moreover, many herders, including those in community organizations, oppose and fear land possession (let alone privatization). Despite these difficulties,

the government has initiated a trial with one community organization in the GTZ project area, which was supported by the project. It has concluded a contract over communal land use, including all four seasonal pastures for member households, for 15 years and to manage its pastures together with the park and the *soum* administration. The results have yet to be studied.

The final effect to be mentioned here is that the project tried to improve the relationship between communities and the administration of the Gobi Gurvan Saikhan National Park. As mentioned in the introduction, this relationship was not good at the start of the project. The project tried to actively involve local people in the management of the park with activities such as monitoring wildlife and setting up a radio communications network with which the communities could communicate with park staff. Besides a lot of material support to the park administration, the project focused on capacity development of its staff. Statements from the current park director reflected the success of this approach: *"[There is] still a good connection with the local people. The administration now has easier control over the park area due to community assistance in monitoring and via the many voluntary rangers. Also the capacity of the rangers has been increased and the management capacities of the administration have been strengthened."* However, this seems to better reflect the past situation, when the project was still ongoing, rather than the current one. The general opinion is that many activities have stopped since the project finished. *"The radio station has broken and so there is no longer communication with the rangers or between the rangers and the communities. Due to a lack of funding, the relationship with the national park and the communities is now very weak. Also, the park administration couldn't continue its benefits because there are very few people left with proper training and knowledge."* Many of the staff that the project helped train has indeed left, and the sole focus of the rangers today is to fight illegal gold mining within the park. In a focus group discussion in Bulgan, the co-management of the park – the cooperation between herders, the *soum* government and the national park administration – was specifically mentioned as a benefit in the past, but because the park rangers no longer communicated with the community, this impact had not lasted.

Community participation

Many communities indicated that their participation had increased, not only during community meetings but also within the household. Herders learned how to talk to people and express their opinions. *"When a new project comes, people are no longer shy; they show what they can do and participate in trainings"*. Both men and women participate more, and especially the women have been 'activated' compared to their life before the communities were established. The communities often participate in *soum* events as a group, and some of them talked proudly about the awards they had won together.

Participation not only improved within the community organizations themselves, but also within the *soum* or *bag*. The community organizations organized many events for the whole *soum* or *bag*. Moreover, 4,000 herders from all over Mongolia visited Ireedui community in Bayndalai to learn about their achievements. This community also mentioned that they now actively seek news and information, while before they did not. Many communities started to exchange information with neighbours and report to each other which projects were available in the area.

Benefits to women

The organization of herder communities brought tremendous change to the lives of the female members. Most of the participants in the focus group discussions were women. In some *soums,* all community leaders were

women, and many of the female focus group participants mentioned that there had been a huge change in the role of women in the household and during community meetings. Most participants confirmed that many women participate and make decisions during community meetings, because they have the communication and organizational skills, which were seen as important to keep communities active. *"Before the project I was an ignorant housewife, and the project opened my eyes. Without it I would still be in my ger standing over my milk pot,"* said one community leader from Khanghongor *soum*. Now she is a member of the World Alliance of Mobile Indigenous Peoples, attends its international conferences, and aims to set up a Mongolian branch of the organization.

In general, almost all community organizations in the focus group discussions agreed that women have learned a lot from the GTZ trainings, have improved their skills, and have become more active in making products together. Because many of the project's trainings were related to tasks that were usually performed by women in the household, such as processing milk and wool, the women became busier (sometimes even too busy). Herder housewives' social lives improved. Many had not had much of a social life before, but through the meetings, workshops, trainings and increased visits to the *soum* centre the women socialized more, and they went to the *soum* centre more often to grow vegetables and prepare yarn.

A change related to men was mentioned by the women of Ireedui community in Bayndalai *soum*. They said men's social participation in the community had improved and that they now consumed less alcohol and drank more responsibly.

3.4 Security

Health

The effects related to health appear to be quite minor, and in four out of eight focus group discussions, these effects were not mentioned at all. The effects that were mentioned range from improved access to health information, increased concern on health, improved prevention of illness, and community help to sick members. Some community organizations organized medical testing for the whole group and this was still ongoing.

Although only mentioned by one community leader, another health benefit has been the improvement in people's diet. The traditional diet is largely dominated by meat, but the project's trainings on vegetable growing has added some variety. The home-grown organic vegetables are also believed to be much healthier than the Chinese ones available. The community members more generally became aware of the importance of healthy food. *"We now have knowledge on safe food, and the project made us realize that we can spend money on our well-being and good food."*

Social cohesion

When asked what was the biggest project impact most respondents answered that the project brought people back together. Many referred to the sudden collapse of communism in 1990, after which the country was left disrupted and its population scattered. During the project's trainings people got to know each other better and learned how to work together as a team. Gradually they became more social, helped each other with household duties and cashmere combing while exchanging ideas and discussing opportunities. The community organizers that were interviewed spoke a lot about the social effects of the project. "*Communities learned to share labour*

and reach solutions together. People learned that initiating and implementing ideas can start from them and not only from NGOs," said one of them. The GTZ-funded information centres facilitated this process, as herders met there and used the space for advertising, children's day care, competitions and many other activities. Old traditions such as celebrating *Nadaam* and worshipping *Ovoo* (stone mounds on passes or mountain tops to mark sacred sites) to pray for rain also seem to have received a new impetus from community organization.

In one example of stronger group feeling, community members who became better-off gave livestock to poor ones, so they could have the animal products, such as the milk, cashmere and wool. This livestock was rotated to other poor households every few years.

The members of Takhila, Nart and Esun Erdene communities said that communities are now more welcoming to outside herders, for instance during *otor*. They do not deny each other access to pastures or wells, because community organizations understand that working together is important. Some mentioned that non-community members sometimes became jealous, but this hardly ever led to conflicts and was usually quickly resolved, sometimes by the person joining the community.

As with many of the project's effects, it must be noted that the stronger social cohesion has been partly undone because many community organizations have become inactive. The main reasons for this were that, first, the droughts that hit the region in the last four or five years forced people to go on *otor* and leave their communities behind. Second, last winter's animal losses meant there were also fewer products to prepare together. Finally, many people have moved to the *aimag* centres for better economic opportunities and for their children to attend school. In the *soum*s visited during this study, about half the community organizations were still active, but their activity level has generally dropped since the project ended. However, the fact that the community members were able to go on *otor,* and found their children's education important enough to move for, could also be seen as positive effects of community organization. It will be interesting to see whether the community organizations will become more active again when more favourable weather returns.

4 QUANTITATIVE ANALYSIS

The quantitative analysis is based on a sample of 280 households, of which 154 were members of active community organizations, and 126 were non-member households. In the initial sampling plan, 350 interviews were envisioned. However, due to the fact that many households had left the region and moved to urban centres, or were away on *otor* to find pasture for their animals after disappointing rains, another *soum* was added to the study and more than a week was added to the field time in order to increase the number of households to be surveyed. Even so, it was not possible to survey the number of households anticipated.

The project team selected a 95 percent confidence interval as its target. Surveying fewer households changed the overall confidence level from 5.08 percent to 5.72 percent.[13] This means that were this survey repeated on multiple samples, it would encompass the true population parameters 94 percent of the time.

The groups of herders that left the area are not represented in the final sample. This may have induced a bias in the results if they are different in some important characteristics from the herders who remained, which is not unlikely, considering the reasons for their absence. However, it does not make the comparison between member and non-member households less valid, as there was no apparent influence of being a member or not on the necessity or ability of households to leave the area.

The distribution of the final sample over the six *soums* is shown in Table 3. The average household interviewed consisted of 4.3 members and had 2.7 children. There were slightly fewer female respondents (44 percent of the sample), and 12 percent of the interviewed households had a female household head. The average age of the respondent was 46 years with a range of 17 to 83. The average duration of the interview was 36 minutes.

Table 3: Sample overview

Soum	Member		Non-member		Total sample	
	Number	Share	Number	Share	Number	Share
Bulgan	22	14%	15	12%	37	13%
Bayndalai	39	25%	25	20%	64	23%
Baynlig	12	8%	22	17%	34	12%
Bayngobi	17	11%	12	10%	29	10%
Bogd	22	14%	27	21%	49	18%
Baruunbayan-Ulaan	42	27%	25	20%	67	24%
Total	154	100%	126	100%	280	100%

As a result of the sampling procedure, the division over the welfare classes in 2002 is very similar across both community members and non-members, as can be seen in Figure 10 below.

[13] Confidence interval = 1.96√((population size–sample size)/(4*population size*sample size)). Based on a total number of 5,993 herder households for the 12 *soums* in 2009 (Schmidt *et al.*, 2009).

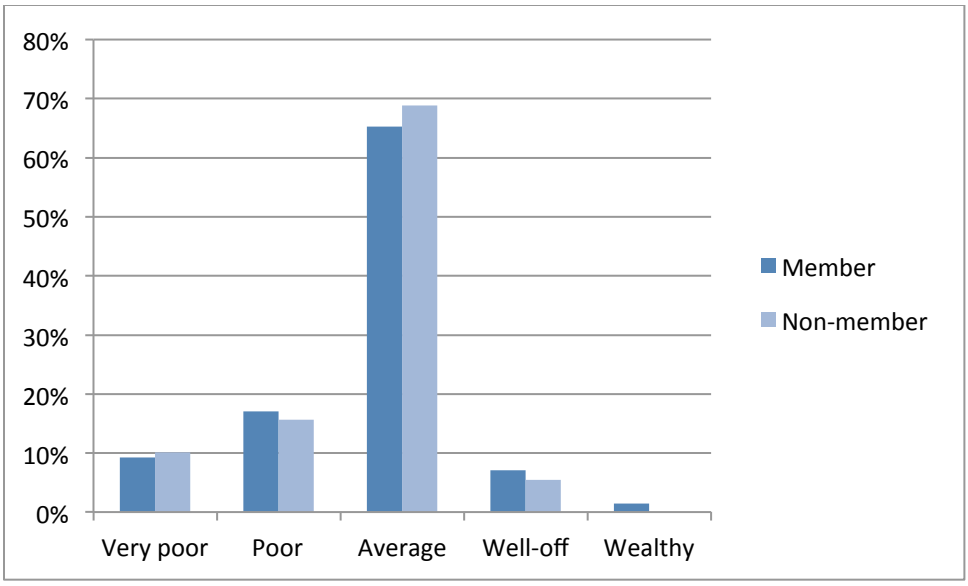

Figure 10: Sample division over welfare classes

4.1 Opportunities

Income and alternative livelihoods

The total average income for 2009 is compared between member and non-member households by aggregating income from all sources, such as selling live animals, (un)processed animal products and vegetables, gold mining, government grants, and jobs. The average income of community member households (MNT 4,281,688 or USD 3,244[14]), is considerably higher than that of non-member households (MNT 3,379,090 or USD 2,560). However, the difference is only just statistically significant at the 10 percent level, because the median income is much more similar (MNT 3,117,000 vs. 2,772,250 for members and non-members, respectively).[15] There are more community households with relatively high incomes, and this causes the larger difference in average income as can be seen in Figure 11 below.[16] Perhaps community organizations gave the more enterprising among the herders the chance to grow.

[14] The exchange rate of 8 September 2010 is used for the conversions (MNT 1319.9 to USD 1).

[15] A non-parametric Mann-Whitney test, was run because income does not have a Normal distribution (U=8594, p=0.100).

[16] The two 'outliers' with average incomes above MNT 20,000,000 were checked and found not to be mistakes. The Box-plot shows the median and inter-quartile range.

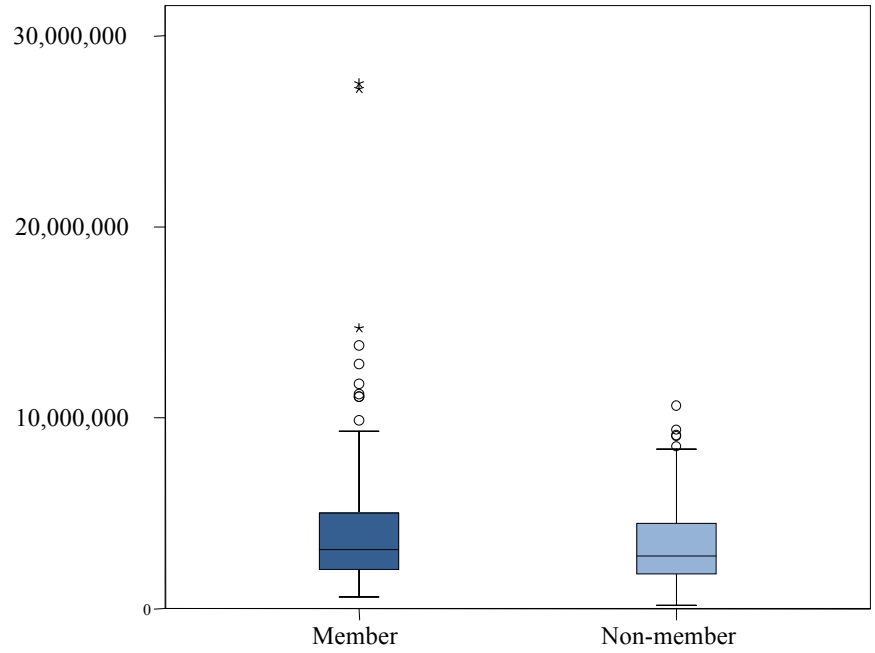

Figure 11: Total average income in 2009

To further investigate the influence of community membership on total income, a linear regression analysis was performed. In this analysis, membership of a community did have a significant positive effect on total income, but the variable lost its significance once total animal numbers in 2009 were controlled for. The level of education in the household also had a significant positive effect.

Overall, there is some evidence that community organization has had a positive impact on overall incomes, but the relationship is not very strong. At a more disaggregated level, the differences become clearer. Table 4 presents income by income source.[17] On average, selling cashmere was the most important income source for all herders, followed by the income from selling live animals for community households, and government transfers for non-member households. Government transfers in 2009 were larger than usual because all households were given MNT 50,000 per household member as emergency relief after the *dzud*. In normal years, pensions and children's money are also important sources of cash income. Statistically significant differences between the groups exist for selling live animals, alternative income sources and selling processed animal products. All these differences are statistically significant at the 1 percent level.[18] The differences for the latter two sources are not surprising as this is what the projects' trainings focused on. Alternative income sources include selling vegetables, providing tourism services, and selling handicrafts. The processed animal products sold consist almost exclusively of dairy products. Why community households would sell more live animals is less clear.[19] It could be that member households had a clearer picture of the dire state of the pastures after the 2009 drought and foresaw that they would not be able to bring all their animals through the winter,

[17] A table with income shares for each source is included in the appendices.

[18] The results of the Mann-Whitney tests are (U=7788; p=0.002), (U=8529; p=0.007) and (U=7497; p<0.001), respectively.

[19] There is no indication that the difference in income from selling live animals is due to a difference in the price each group could get: there is no significant difference in the locations where they make their sales, and questions about bargaining power were answered similarly, as well.

therefore taking the precaution to sell more. However, this is speculation. Gold mining does not seem very important, and this is somewhat conflicting with what was heard in the interviews and focus group discussions. It is very likely that respondents purposefully underestimated their income from this illegal source.

Table 4: Average income per income source

Source	Community member	Non-member
Total average income	MNT 4,281,688	MNT 3,379,090
Total median income	MNT 3,117,000	MNT 2,772,250
Selling cashmere	1,702,857	1,670,444
Selling live animals*	1,069,182	412,683
Government transfers	614,396	749,000
Selling other unprocessed animal products	369,610	301,679
Jobs	227,623	125,760
Alternative income sources*	117,273	35,556
Gold mining	105,000	56,667
Selling processed animal products*	71,786	16,429
Transfers from relatives	3,961	10,873

An asterisk signifies statistically significant differences

The survey results show that the project's trainings did affect income by stimulating further processing of animal products and starting alternative activities, but that this extra income is relatively small. Even if only those households that were involved in these activities are analyzed, the average share in total income remains relatively small as can be seen in Table 5. This is in line with what was found in the qualitative analysis. In the whole sample, only one household generated more than 50 percent of its income from alternative income sources.

Table 5: Income shares of processing animal products and alternative livelihoods

	Community member	Non-member
Share of households with alternative income sources	28%	5%
Average % of total income	8%	14% *
Share of households selling processed animal products	22%	10%
Average % of total income	6%	6%

*Note: Of the only six non-member households involved in these activities, two earned a lot with these activities, which explains the high percentage.

To see how community member households viewed the development of their income situation compared to before they joined the community, they were asked if it had become harder or easier to meet household expenses since joining. Non-member households were asked to compare their current income situation with that in 2002, the year in which most community organizations were formed. Figure 12 shows that the group of households that feels its income situation has become harder is much larger for non-member households. A Chi-square test showed the difference to be significant at the 1 percent level. Of those households that said it had become harder, almost all indicated that this was because expenses had gone up, while those whose situation had improved, gave increases of income as the main reason for the change. This was the same across both member and non-member households.

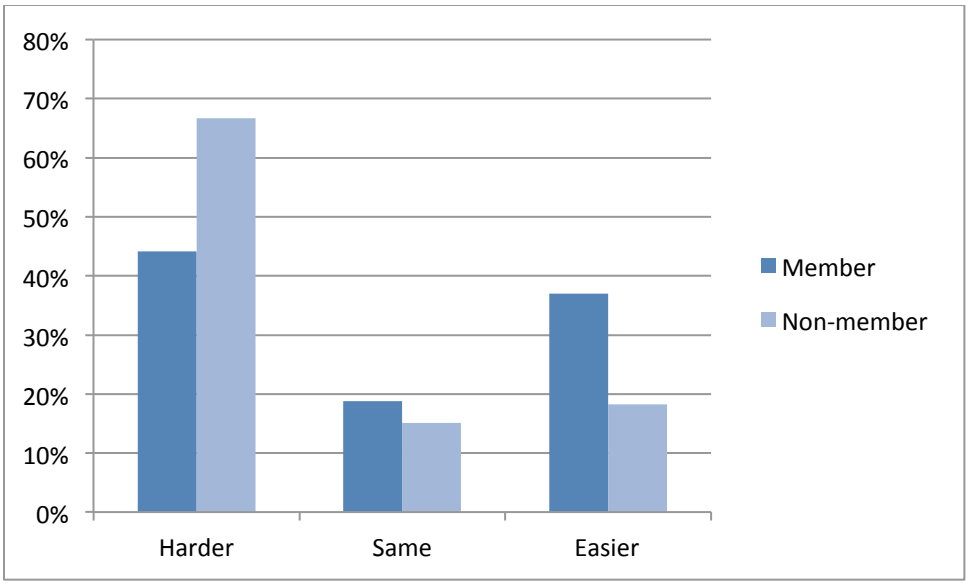

Figure 12: Change in the ability to meet expenses

Because herders in Mongolia are largely self-sufficient, living off the meat and dairy products from their animals, an analysis of cash income alone does not show the whole picture. Animals are generally slaughtered just before the winter, so the family has enough meat to make it until spring. The amount of animals a household can slaughter for meat is therefore an important welfare indicator. On average, member households slaughtered 28 animals in 2009 compared to 24 for non-member households. This difference is statistically significant at the 1 percent level. The slaughter rate (total animals slaughtered/total animals in 2009), however, is not statistically different.

Livestock management

The average size of the herd does not differ significantly between member and non-member households. Both at the time of the survey in 2010 and at the end of 2009, when animals are normally counted in the annual census, community member herds were slightly larger, but not significantly so. In 2010 member households had an average of 260 animals versus 245 for non-members.

In the composition of the herd there are small differences. Goats make up a slightly smaller and horses a slightly larger share in member herds, but the differences are not great, though statistically significant (at 5% and 1% level, respectively). The differences for the other animals are not statistically significant. What is clear is that both member and non-member herds are dominated by goats. The figure below shows the herd composition for both members and non-members.

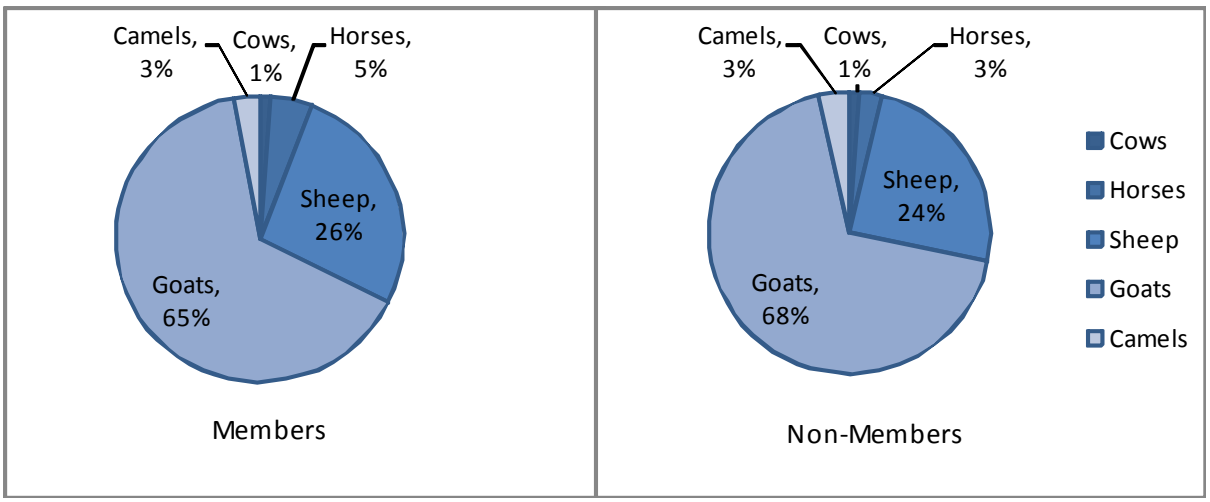

Figure 13: Herd composition

As presented in the qualitative analysis, buying high-quality breeding stock from other parts of Mongolia to improve the quality of the herd is not very common anymore, but breeding animals are still bought or exchanged on a more local level. In the survey, the distinction between these two forms of breeding was not made as it had led to confusion in the pre-test. Table 6 below shows the share of member and non-member households that bought or exchanged animals for breeding last year. Slightly more member households did so, but the difference is not statistically significant. The average number of animals bought or exchanged did not significantly differ either: 2.2 and 2.3 for members and non-members, respectively.

Table 6: Breeding stock bought or exchanged

	Community member	Non-member
No	54%	58%
Yes	46%	42%

With regard to veterinary services, member households, on average, sought out veterinary care 1.7 times over the last twelve months. The number for non-members is only slightly lower with 1.5.[20] Overall, only 13 percent of the sample did not seek out veterinary services at all. Most of these households indicated that they had not needed veterinary care. A few people said veterinary services were not available, or they could not afford them.

As can be seen in Figure 14, the most common types of assistance sought out were vaccination, dipping (a parasite treatment), and treatment for disease.[21] Again this is the same for member and non-member households.

[20] The difference is just *not* significant at the 10 percent level (p=0.107).

[21] The numbers don't add up to 100 percent, as respondents could indicate more than one type of veterinary service.

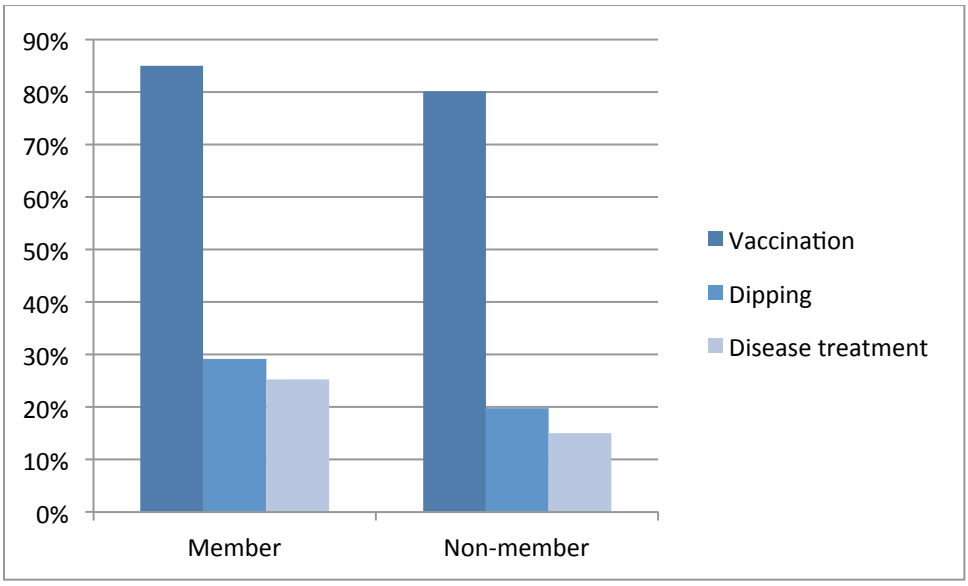

Figure 14: Most common types of veterinary services

Overall, there are no great differences in livestock management between member and non-member households. The size and composition of the herd is very similar. Both groups have around 250 animals, and thus fall into the "average" welfare class. Both groups also rely mostly on goats and sheep. Nor could a difference between focus on herd quality over quantity be established. No significant differences were found with regard to either breeding or veterinary care.

Pasture management

Good pasture management is vital for maintaining a balance in Mongolia's fragile semi-desert ecosystem. To see how decisions about pasture management were taken, the respondents were asked who they talked to about decisions such as whether to reserve pasture, where to move, and when to move. Member households more often discuss these decisions with others outside the household, but the share of those who do not is still surprisingly large. Forty-six percent of community members do not discuss with anyone (see Figure 15). The percentage of non-member households is 63.[22] Of those member households that do discuss, 25 percent does so within the community organization. Considering this was one of the main reasons to establish community organizations, it is disappointing to see how little of it remains. Neighbours were consulted by roughly the same shares in both groups: 29 and 33 percent for community households and non-members, respectively. Government was consulted by only a very small proportion of the respondents.

[22] The difference between both groups is statistically significant at the 5% level (Chi^2=8.75, p=0.03)

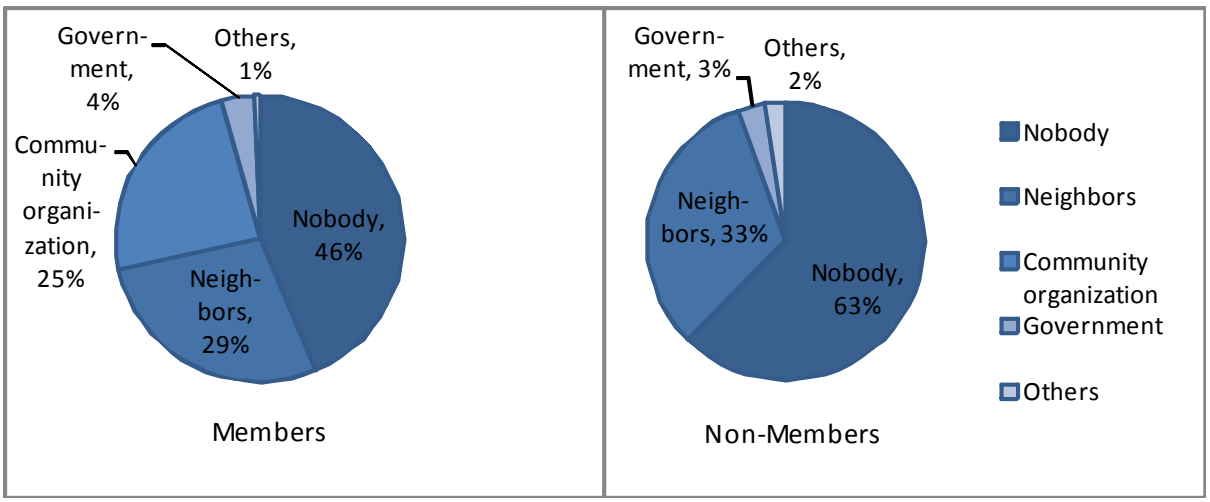

Figure 15: Pasture management coordination: who do you discuss with?

In the past, good pasture management could be easily observed by the number of seasonal moves herders made every year: the more moves, the better. This is not the case anymore. Herders can be forced to move often due to pasture degradation, or contrarily, have to stick to one place due to the lower number of water sources or to protect their winter pasture. Figure 16 shows how the number of moves changed since joining the community (or 2002 for non-members). Significantly more non-member households said they now make more moves ($p<0.05$).

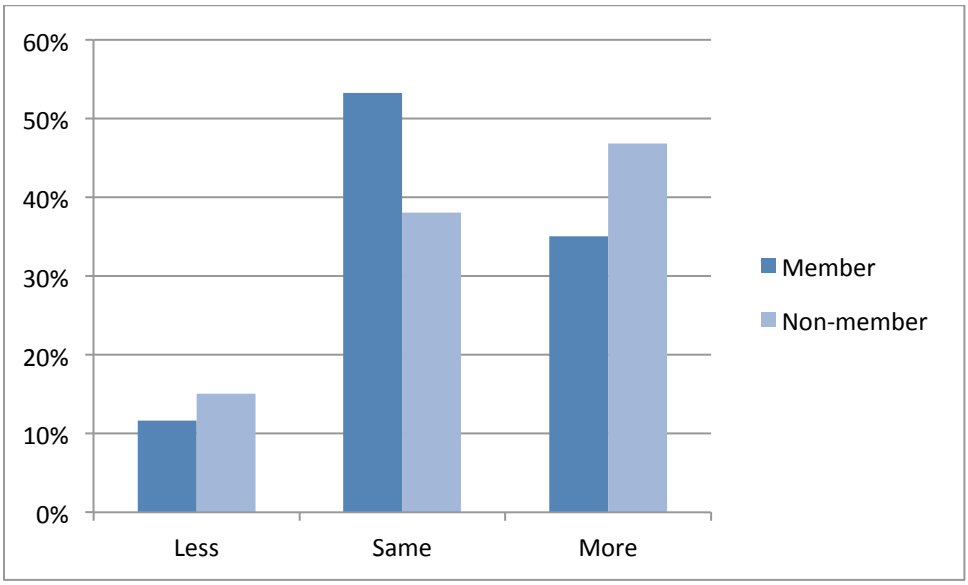

Figure 16: Change in seasonal moves

Looking at the reasons that were given as to why changes occurred gives more insights. Making more moves is closely related to the condition and availability of the pastures and to the changing weather or climate. Forty-three percent of the herders who now make more moves gave a neutral answer: "*we follow the pastures*" or "*it depends on the weather/grass*". A slightly larger share, 49 percent related the increase in the number of moves explicitly to deterioration in the pastures, the weather or the climate. There is not much difference in this

regard between member and non-member households. The only herders who made more moves due to a positive reason were community organized herders, and they linked this directly to the community: "*the community fixed wells, so now we can move more*" or "*we now all leave the winter pasture together*". This positive answer was given only 6 times, though (out of 54 community households who now make more moves).

The most common reasons given for a reduction in the number of moves was people had become too old, had no transport, or could not afford it anymore. This was said by 13 out of 37 respondents in this group – almost all non-members. Other reasons that were mentioned relatively often were 'a lack of pasture to move to' (10 respondents said this), and the fact that there was no longer any need to move because the household had fewer animals or was in a 'good place' (7 respondents).

Besides the seasonal moves, herders also generally go on long treks or *otor* with their animals in the autumn to strengthen them for the coming winter. If droughts occur, *otor* may be necessary to places where rain has fallen. In the times of the collectives, special areas were reserved for autumn *otor*, and in case of emergencies, the *aimag* administrations made agreements to share good pasture land. During those times, transport and manpower were provided by the *negdel*, but since they were dissolved, going on *otor* became more difficult. In the Gobi this does not seem to be a large problem. Table 7 shows the share of member and non-member households who are able to do *otor* when needed. Slightly more member households indicated they can, but in general a large majority of both groups can.[23] Households that are not able to do *otor* cannot because they lack manpower, have no place to go to, or lack transportation. In the group discussions, only half of the groups said they still practiced *otor*. One interpretation could be that more people do still feel they can do this when necessary, but have stopped doing it regularly.

Table 7: Ability to go on otor

	Community member	Non-member
No	16%	23%
Yes	84%	75%

Another important element of pasture management is the access to a good winter camp and reserved winter pastures. In order to keep livestock sheltered from the harsh Mongolian winters, herders require a winter camp. The most simple winter camp consists of just a wall to provide protection from the wind, while better camps have a roof as well and are closed on three sides. Member and non-member households do not differ in the access to a winter camp, nor in the quality thereof. Nearly half of both groups have access to a well-protected camp, while 10 percent has to make do without any camp. The large majority of both groups also have an official ownership certificate of the camp (93% and 83% for members and non-members, respectively).

Owning a winter camp, which comprises only the structure and the land it sits on, is important, but just as important to get through the winter is to have access to winter pastures that were not grazed during the rest of the year. In the past, fixed dates to leave winter pastures were set by the collectives, and herders did not really have a choice about it. Often a truck came, loaded up the *ger*, and that was that. In the new system, *soum* governors had the task to coordinate pasture management but generally did not. During the project, communities were again stimulated to agree on a fixed date to leave the winter pastures together. If not

[23]The difference between the two groups is almost significant at the 10 percent level (Chi^2=2.686; p=0.101).

everyone leaves at the same time, the ones who do cannot know that the others are not using "their" pastures in their absence, and therefore giving them no incentive to leave. This practice seems to have partly remained in place, as more community member households indicated they could reserve winter pasture easier than non-members (see Table 8).[24] However, more than half of community herders said they could not. For members and non-members alike the reasons for not being able to were the same. "*Other herders would use it*"; "*there is not enough pasture land*"; or "*the pasture is degraded*" were the reasons mentioned most often. Before the community members formed their communities, the situation was much more similar for both groups.[25] Roughly half could reserve pastures. It, therefore, seems that community organization has partly prevented the decline for its members, rather than leading to improvements. Both groups most often blamed climate change for the decline, followed by in-migration of other herders.

Table 8: Access to reserved winter pastures now and in the past

	Community member		Non-member	
	Now	Before	Now	Before
No	58%	50%	75%	54%
Yes	42%	50%	25%	46%

The preparation of hay and fodder is also important to bring the animals through the winter. It can be used when animals cannot feed directly from the pasture. During the project, some communities started preparing hay together on pieces of land that were fenced off. However, the Gobi climate is not the most suitable for hay production, which is reflected in the relatively small share of respondents who said they could generally produce enough hay and fodder to feed their animals throughout the winter.[26] As can be seen in Table 9 below, the share of member households who can prepare enough hay and fodder is almost twice as large as that for non-members.[27] For both members and non-members the lack of available land, and the Gobi climate were the reasons given for not being able to produce enough.

Table 9: Ability to produce enough hay and fodder

	Community members	Non-members
No	75%	87%
Yes	25%	13%

For those herders who cannot produce enough, buying hay and fodder is an alternative. Here again, slightly more community herders seemed to indicate that they were able to buy what they could not produce (see Table 10). However, the difference is not statistically significant. High prices and low availability were quoted most often as reasons for not being able to buy enough.

[24] The difference is statistically significant at the 1% level (Chi^2=9.533, p=0.002).

[25] As with the other "change questions", non-member households were asked about changes compared to 2002.

[26] Although this question asked about the general ability to produce enough hay and fodder, last year's *dzud* undoubtedly affected respondent's answers.

[27] The difference is statistically significant at the 5% level (Chi^2=6.064; p=0.014).

Table 10: Ability to buy enough hay and fodder

	Community members	Non-members
No	62%	69%
Yes	38%	31%

Taking this together, 53 percent of member and 40 percent of non-member households are able to grow or purchase enough hay and fodder. The largest share, roughly 45 percent, of both members and non-members feel that their ability to acquire hay and fodder has not changed compared to the past. While being the minority in both groups, there were significantly more member households who indicated this had improved (see Figure 17).[28] The deterioration was mostly blamed on climate change, while improvements were mainly linked to community organizations.

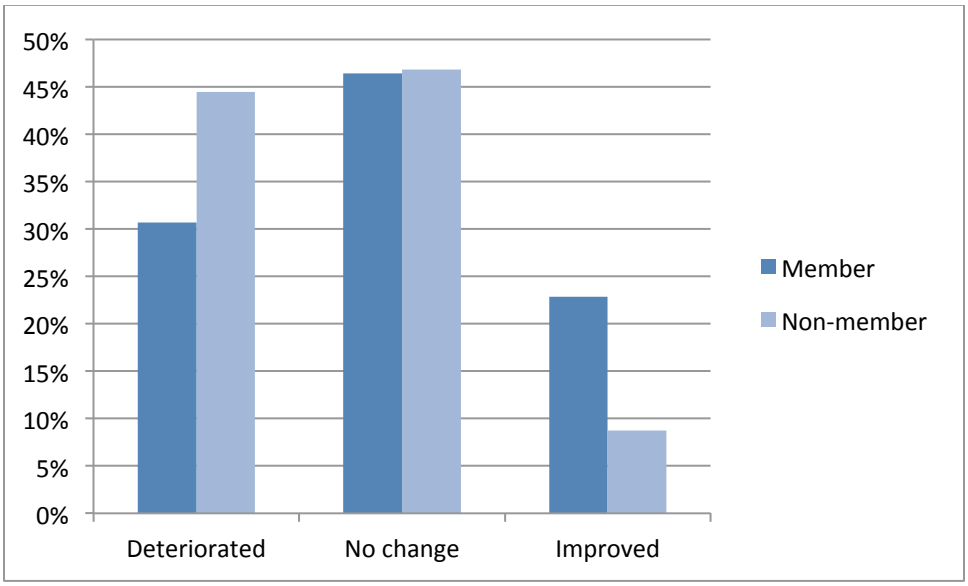

Figure 17: Change in the ability to acquire hay and fodder

Overall, community member households seem better able to prepare for winter. While there is no difference in the availability of winter camps, significantly more member households are able to reserve winter pastures and prepare or buy hay and fodder. More member households were also able to do *otor*, the latter difference being almost significant at the 10 percent level.[29] Despite this, community households do not seem to have fared any better through last winter's *dzud*. When animal numbers in 2010 and 2009 are compared, both member and non-member households' herds were about 30 percent smaller after the winter.[30] During the fieldwork, it was mentioned several times that, while communities tried to deal with the *dzud*, their efforts were futile in the face of such a harsh winter.

[28] The difference is significant at the 1% level (Chi^2=11.915;p=0.003).

[29] Chi^2=2.686;p=0.101.

30 As mentioned above, community member households did sell more animals than non-member households, but even when taking this into account, the average loss rate remains similar. A more detailed look into the shares of households with different loss rates did not show up any significant differences between the groups either.

A final aspect of pasture management to be discussed here is the access to water sources. After the collapse of the collective system, many wells and natural water sources were not maintained, which meant large pasture areas could not be used, as there was no water nearby for the animals. In many communities, repairing old wells, digging new ones, and cleaning up natural water sources were part of the activities. Despite this, both member and non-member herders are almost equally negative (and positive) when they compare the current access to water sources to the situation before joining the community organization (2002 for non-members). Only 11 percent see an improvement (see Figure 18). Climate change was most often seen as the reason for the deterioration.

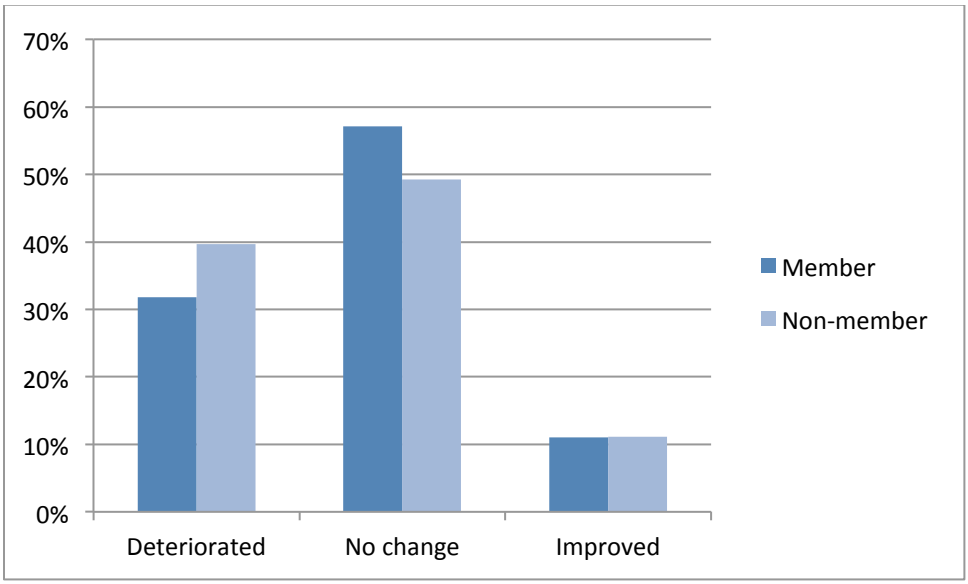

Figure 18: Change in access to water sources

Access to credit

Having access to credit is important to facilitate opportunities and increase security. Moreover, herders' income is seasonal, and credit is therefore important to tide-over low-income seasons. The GTZ project aimed to improve this by giving seed money and stimulating both the Buffer Zone Councils and the community organizations to set up funds from which (micro) loans could be provided. The qualitative analysis already showed that both institutions have all but disappeared. This is confirmed by the results of the survey. Those households that took out loans during the last twelve months did this almost exclusively from banks (93 percent of the cases), and only one household indicated it had taken out a loan from a community fund. However, as shown in Table 11, community member households did take out loans significantly more often than non-members,[31] signalling that the project, or the fact of being part of a community, did have an effect on the use of credit. This is not yet proof that member households had better *access* to credit. Of those households that did not take out loans, the majority of both groups said the reason was they did not need a loan. Neither is there a significant difference in the shares of households that said they could not take out a loan, for example, due to the complexity of the process or the lack of collateral.

[31] The difference is significant at the 1% level (Chi^2=10.555;p=0.01).

Table 11: Acquired loan during last 12 months

	Community member	Non-member
No	27%	45%
Yes	73%	55%

When analyzing how respondents thought access to credit had changed since joining the community (2002 for non-members), a mixed picture emerges. A significantly larger share of member households than non-member households indicated that getting a loan had become easier since joining the community.[32] However, a very large share of member households also indicated it had become harder (see Figure 19). This could be due to a misunderstanding of the question by some households, not using the before-joining situation as the baseline for their comparison, but instead making a comparison with how access to credit was before the project ended, or even before the *dzud*.[33] Based on both the current use of credit and the perception of change in the access, it can be concluded that the project and community organization have positively affected herders' access to credit.

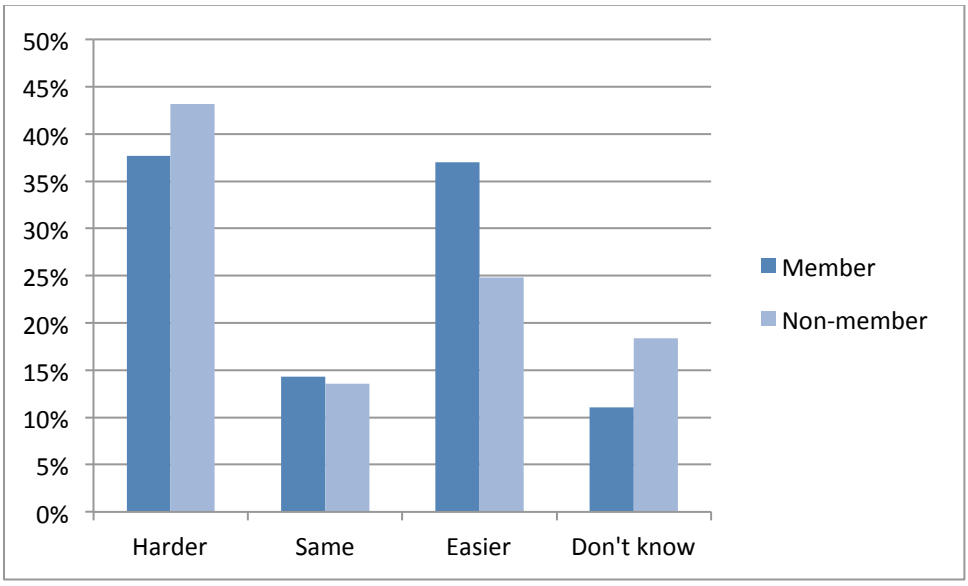

Figure 19: Change in the access to credit

Housing and durable goods

Mongolian herders live in *gers*. Sometimes the decoration, such as the painting of the doors and other wooden parts and the carpets on the floor of the *ger,* can tell a lot about the welfare of the household. *Gers* also come in different sizes, which is also related to a household's welfare. However, when moving with their animals, even wealthier herders sometimes just bring a small undecorated *ger*, so it can be tricky to read a household's

[32] The difference is statistically significant at the 10% level (Chi^2=6.421;p=0.93).

[33] It was noted in the pre-tests that some households indeed had trouble with this, as the most recent changes, and the ones most strongly felt, were the 09/10 *dzud* and the ending of the project, rather than the beginning of the project. Enumerators were specifically instructed to focus on this issue and explain clearly which comparison was asked for, but some difficulties almost certainly remained.

wealth by just looking at its *ger*. To circumvent possible misinterpretations, households were therefore simply asked how many *gers* they owned. Both member and non-member households have an average of two *gers*. The small difference between the groups, 2.01 for members and 1.95 for non-members is not significant. Some households also have an apartment or *hasha*, which is a piece of fenced-off land in the urban centres, but community and non-member households did not differ in this respect either.

Figure 20 below shows the shares of households that own certain durable goods. Solar panels and motorcycles are the most commonly owned items, and in this members and non-members do not differ. The frequency of ownership of both a television and a car or truck does differ significantly, with larger shares for member households.[34]

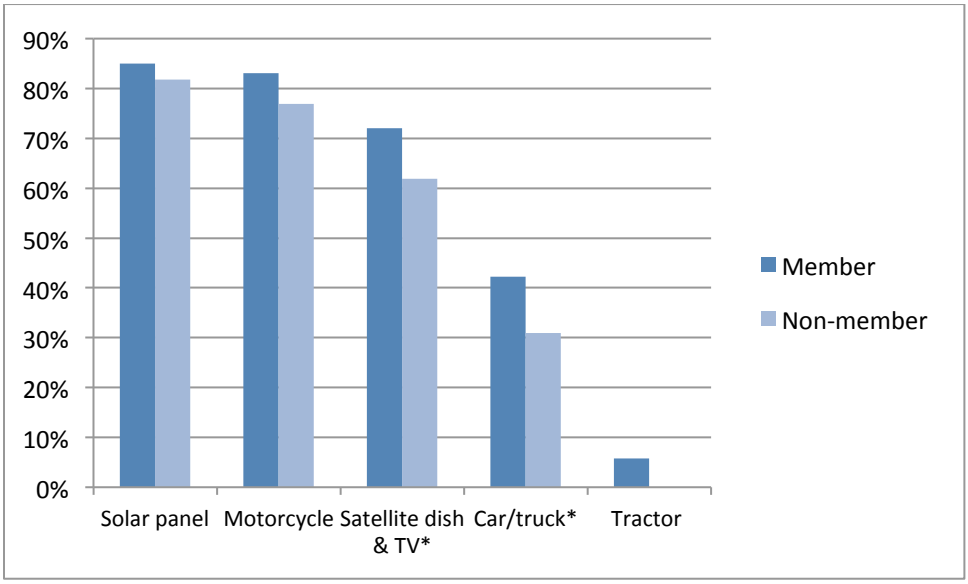

*Figure 20: Share of households owning durable goods (*indicates a significant difference)*

Education

A slightly larger share of community household children between 6 and 15 attends school, but the difference is not significant, and more than 90 percent of the children of both groups do. The reasons given for not attending school are that households cannot afford the school expenses or that children are needed to help with work.

Table 12: School attendance

	Community members	Non-members
No	6%	10%
Yes	94%	90%

The most common education level of the household heads is either lower secondary school, or primary school as can be seen in Figure 21. However, if the highest level of education of any of the household's members is looked at, a significantly higher share of community households turn out to have a member in university or

[34] The differences are statistically significant at the 10% level (Chi^2=2.957; p=0.85), (Chi^2=3.576; p=0.59).

with a university degree. For community members, the share is 26 percent, while it is just 10 percent for non-members.[35] Given that there is no difference in the education levels of the heads of the household, it is safe to say that university attendance was influenced by the community organization membership rather than the other way around.

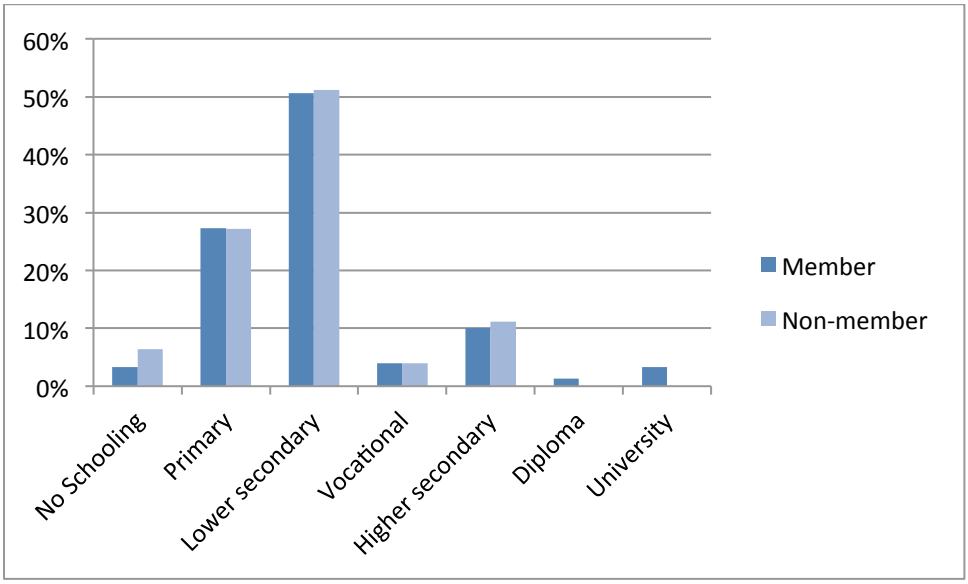

Figure 21: Education level of the household head

Environmental awareness

In general, there is not much difference between member and non-member households in their perception of the changes in the natural environment. Respondents were asked about these changes on five levels: the abundance of pasture grass; the variety of pasture plants; the occurrence of medicinal plants; the occurrence of wildlife and birds; and the condition and abundance of natural water sources. Both groups were equally negative about changes in pasture grass abundance and pasture plant variety. Three-quarters found grass abundance to have decreased, while almost 60 percent said plant variety had gone down. Similarly, around 75 percent in both groups said natural water sources had declined in quality and abundance. The only level on which members and non-members did not see eye-to-eye, was on the occurrence of wildlife and birds, with member households being significantly less negative.[36] The latter can probably be explained by their monitoring activities. Overall a strongly negative image exists of the changes in the natural environment. A table with the full results for this question is included in the appendices.

Households were also asked about their fuel use. The two most important sources of fuel are animal dung, used by 94 percent of the total sample, and firewood, used by 26 percent.[37] One goal of the project had been to reduce the use of firewood, as this damages trees and bushes, especially the saxaul plants in one part of the park. The project supported the local manufacturing of fuel-efficient stoves and organized trainings on how to

[35] The difference is significant at the 1% level (Chi^2=11.955;p=0.001).
[36] The difference is significant at the 5% level (Chi^2=8.192;p=0.042).
[37] Respondents were asked to give their first and second most important fuel types. That is why the sum of both exceeds 100%.

make compact briquettes from coal dust and animal dung that burn efficiently. This seems to have had a lasting effect. A significantly smaller share of member households uses firewood: 22 percent versus 32 percent for non-members.[38]

4.2 Empowerment

The GTZ project's approach was one of bringing all stakeholders together, the most important being the park administration, the local government and the herders, in order for them to co-manage the pastures. Before the project, the relationship between the herders and the park staff was not good. Herders were, therefore, asked how this relationship had developed since they joined the project (2002 for non-members). As shown in Figure 22, a much larger share of community-member households feels the relationship has improved.[39] Most of the positive community members thought the improvement was due to community linkages. A large group, including non-members said that things had improved because rangers had started doing their work better. Respondents who thought the relationship had deteriorated conversely said that rangers were now worse at their job, or said they did not know, because they simply never saw them. A number of people did not understand the question properly, apparently thinking the question was about changes since the project had stopped in 2006, but their responses are still interesting. They said that there had been an improvement during the project life, but that the relationship was poor again now. This is in line with the results from the qualitative assessment which found that the relationship did improve significantly in the past, but deteriorated again after the project. A considerable share of member households apparently still believes the relationship is better than before the establishment of community organizations.

[38] The difference is significant at the 10% level (Chi^2=3.331; p=0.068). The effect is even a bit stronger if only the first most important fuel source is looked at. For 15% and 25% of members and non-members, firewood is the most important fuel, respectively (statistically significant at the 5% level).

[39] The difference in perception is significant at the 1% level (Chi^2=19.369; p<0.001). This analysis could only be done with those respondents who lived in the vicinity of the Gobi Gurvan Saikhan National Park, *i.e.*, 102 community households, and 65 non-member households.

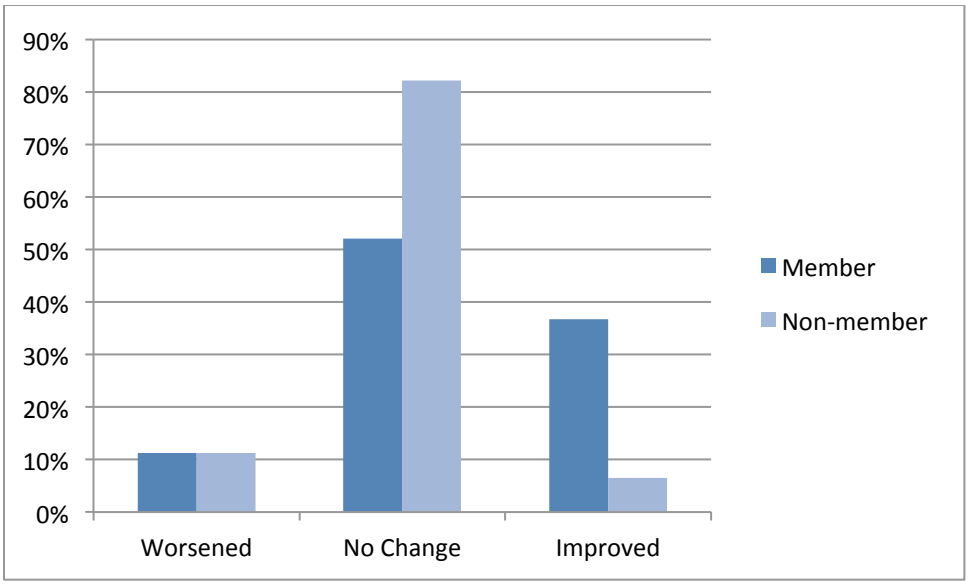

Figure 22: Change in the relationship with the Gobi Gurvan Saikhan NP administration

It is also interesting to see if, after the communities' closer contact with local government during the project and the co-management of the pastures with both local government and park administration, they now felt local government's responsiveness had increased and felt able to influence policies that affect them. About half of all respondents think they are able to influence decisions, and this does not differ significantly between member and non-member households, as can be seen in Table 13 below.

Table 13: Ability to influence local government decisions

	Community members	Non-members
No	47%	50%
Yes	53%	50%

When asked whether this had changed, it turned out that a large majority felt it had not. However, among the people who did see a change, a positive view dominated (see Figure 23). This was generally true for both member and non-member households alike. There is a small difference, with community members being both slightly more positive and less negative, but the difference is not statistically significant. Therefore, improvements do seem to have taken place, at least in some places, but this has not affected member households significantly more than non-member ones. While these small improvements can, therefore, not be linked directly to the project, the answers to the question about what caused the change do seem to point in that direction. More than half the community members linked the improvements directly to their community organization. The remaining share of community members and near to all non-members attributed them to an improvement in the government's attitudes. It is not unreasonable to suggest that these might, at least in part, have come about due to the project's work. This is also where the sampling strategy of selecting control households from the same areas might have had a blurring effect on the results. Both groups are represented by the same local government, and potential improvements brought about by the project would therefore affect all households in the area, and not only community households.

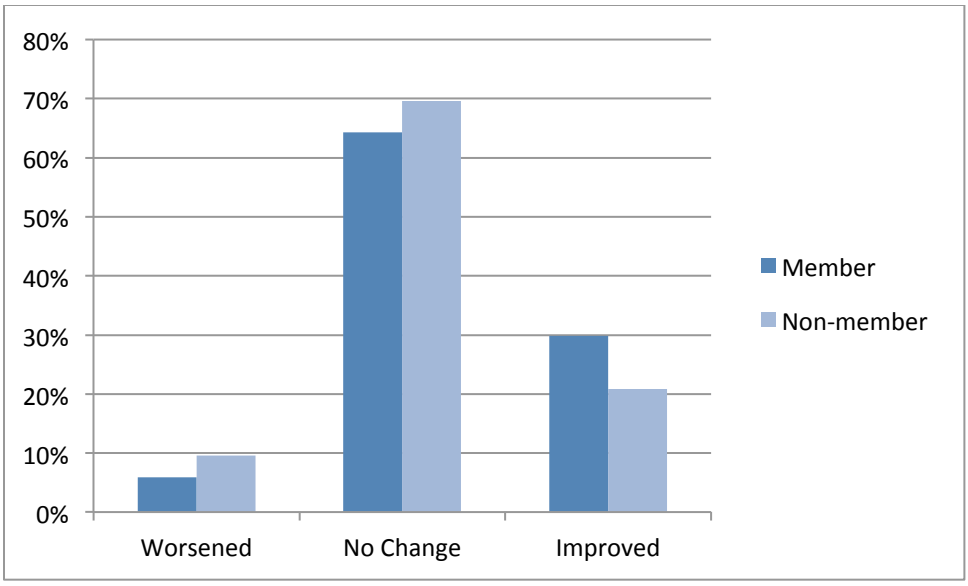

Figure 23: Change in local government influence

Role of women

Significantly more member households were happy about the role of women in their (wider) community than non-member households (see Table 14).[40] Male and female respondents did not differ in this respect.

Table 14: Satisfaction with the role of women

	Community members	Non-members
No	23%	28%
Yes	50%	32%
Don't know	27%	40%

On the question whether the role of women had changed, again significantly more member respondents were positive (see Figure 24).[41] A majority of members attributed the improvement to the community organization. The main causes for the improvements mentioned by non-members were women's own initiatives and government action. Here the survey results are again in strong accordance with the qualitative assessment. It is clear that one of the most strong and lasting effects of the GTZ project and community organization has been the chance given to women to bring themselves more to the forefront.

[40] The question pertained to the role of women in the larger community, not just the community organization. In Mongolian these are different words, so there was no chance of confusion. The difference is statistically significant at the 1% level (Chi^2=9.178; p=0.01).

[41] The difference is statistically significant at the 1% level (Chi^2=17.593; p<0.001). Here a difference in the gender of the respondent did matter. Significantly more men said it hadn't changed (p<0.05).

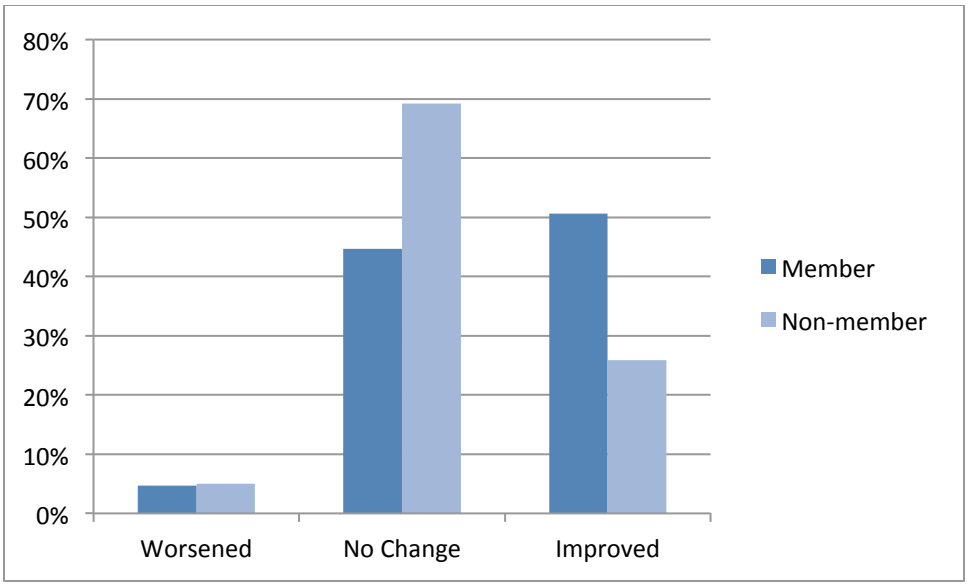

Figure 24: Change in the role of women

4.3 Security

Health

One health aspect is people's diet. The effect on vegetable growing has already been discussed in the Opportunities Section. No specific questions about people's diets were included in the questionnaire, but it is clear that the project did have an effect on this. Another aspect of health is access to good medical care. While the project did not focus on this specifically, it was investigated whether, through generally increased awareness or financial means, the project had had any effect on the access to medical care. Therefore, respondents were asked where they generally went or would go for medical care if a household member had a serious medical problem. Generally, *bag* and *soum* centres do not have appropriate medical facilities, and one would go to the *aimag* centre, and preferably to Ulaanbaatar, to receive more proper medical care.[42] As shown in Figure 25, the large majority of herders cannot afford to go any further than the *soum* centre. Less that 10 percent of the herders are able to go either to an *aimag* centre or to Ulaanbaatar. There are no substantial differences between member and non-member households.

[42] Those who can afford it may also go to China for serious problems.

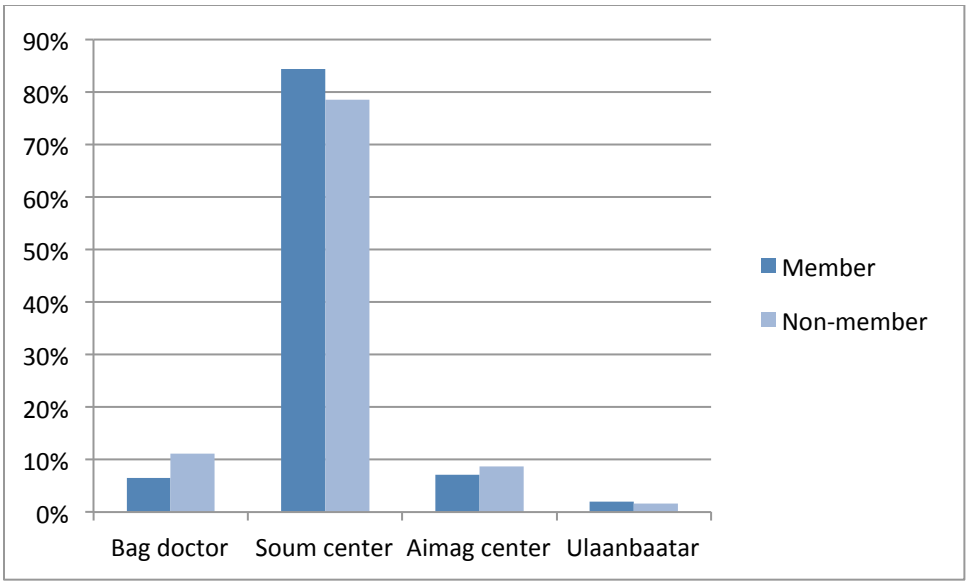

Figure 25: Access to medical care

Social cohesion

The impacts from the project on social cohesion were investigated by asking respondents about the occurrence and nature of disputes related to pasture use and water sources in the area. Disputes seem to occur with similar frequency in both community and non-community areas. There was no significant difference in the way herders from both groups viewed this. As shown in Figure 26, about a third of the herders never witnessed disputes, while for most herders disputes occur occasionally.

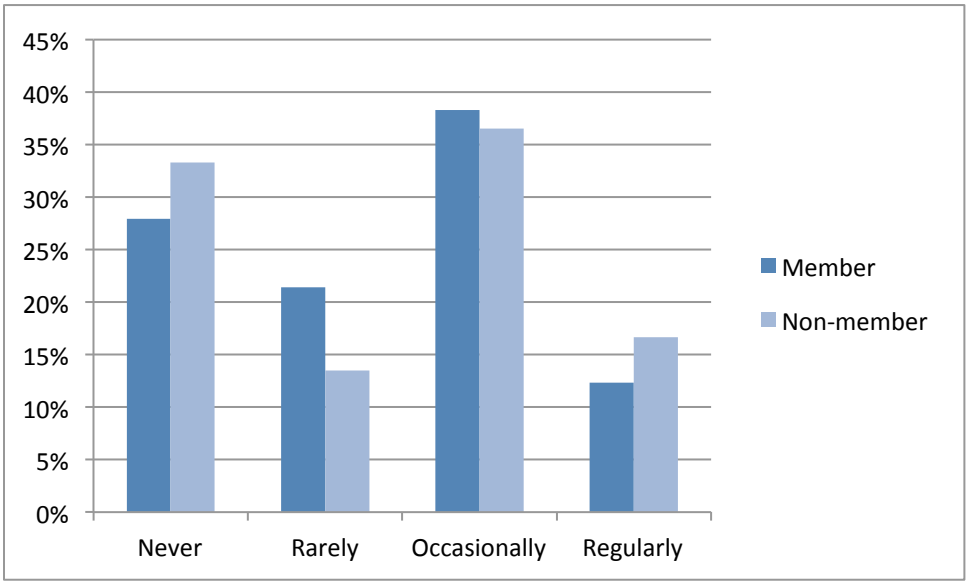

Figure 26: Occurrence of disputes over pastures or water sources

Disputes most often took place with other local herders. Forty-seven percent of community members and 63 percent of non-members said this, while 28 and 21 percent said the conflicts took place with herders from

outside. The remainder had seen conflicts with both. These differences were not statistically different. Neither is there a difference in the way disputes are resolved. Usually, as indicated by 84 percent of all herders, this is done by negotiation among the conflicting parties themselves. A mere 10 percent said they approached the *soum* or *bag* government to facilitate. Some herders also said disputes simply were not resolved.

More than half of all households feel that disputes increased. Although they are a minority, almost all respondents who saw a decrease in the occurrence of disputes were community members.[43] Two thirds of these households linked this to the actions of community organizations.

In general, it must be concluded that the project and community organization were not able to do much about the trend of increasing conflicts induced by ever scarcer good pasture and water sources.

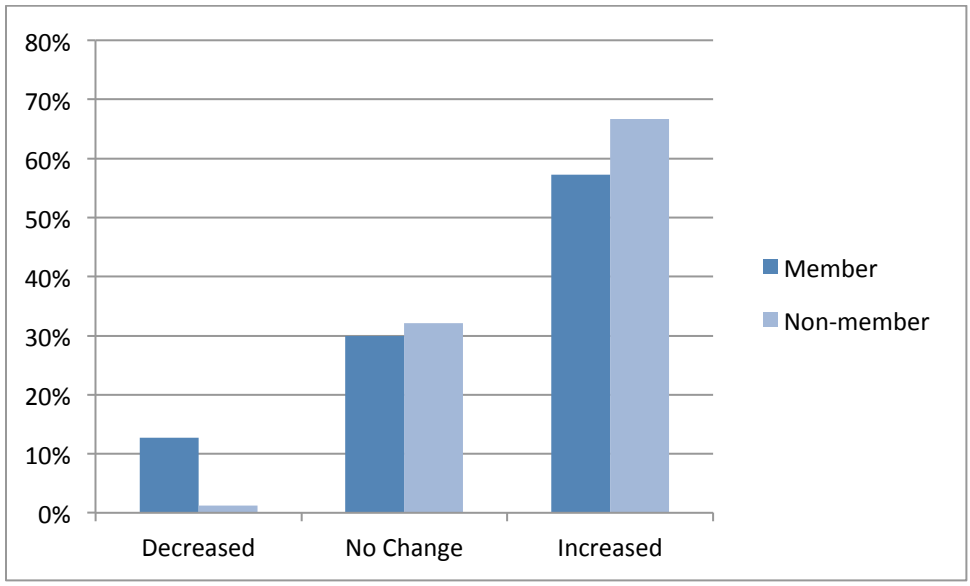

Figure 27: Change in dispute occurrence

Table 15 provides an overview of the impacts of the GTZ project on the welfare indicators that were found in the quantitative analysis. Only those differences between community member and non-member households are presented that were statistically significant at the 10 percent level or less. Some of the indicators for which no statistically significant differences were found in the quantitative analysis did prove important in the qualitative analysis. A synthesis of both analyses is provided in the next section.

Table 15: Overview of quantitative analysis results

	OPPORTUNITIES	DIFFERENCE BETWEEN COMMUNITY MEMBER AND NON-MEMBER HOUSEHOLDS
	Income	Median income 12% higher
	Alternative livelihoods	2.2% vs. 0.7% of total income
	Livestock (management)	-
	Pasture management	17% more members discuss pasture management with others
		17% more members have access to winter pastures
		12% more members have the ability to produce or buy hay & fodder

[43] Overall the difference in perception is statistically significant at the 5 percent level (Chi^2=8.584; p=0.014).

	OPPORTUNITIES	DIFFERENCE BETWEEN COMMUNITY MEMBER AND NON-MEMBER HOUSEHOLDS
	Access to credit	18% more members have loans
	Housing	-
	Durable goods	10% more members own a television and satellite dish
		11% more members own a truck or car
	Education	16% more member households have someone with a university education
	EMPOWERMENT	
	Governance mechanisms	31% more members feel the relationship with the park has improved
	Community participation	-
	Benefits to ♀	18% more members are happy with the role of women
		25% more members see an improvement in the role of women
	SECURITY	
	Health	-
	Social cohesion	-

5 QUALITATIVE-QUANTITATIVE SYNTHESIS

This section provides a synthesis of the empirical results described in detail in the previous two sections. The project had an impact on all three dimensions of poverty. Four years after the project ended and after having suffered a number of very difficult years weather-wise, some of these impacts are still clearly visible while others have diminished.

Within the *Opportunities* dimension, people's income changed. The household survey analysis showed that overall income of the project's participants was higher. Income composition changed as well, with participants having several new sources of income. For most, though, the income from these new sources is only marginal compared to the main source of income, cashmere. Slightly more participants have also been able to buy television sets and cars. The income effect is confirmed by the qualitative analysis. People were very appreciative of the new skills they learned that allowed them to diversify their income, but they also said that it had only slightly increased their total income. Of course, these are only averages. For a number of individual households, the alternative livelihood trainings led to a new main livelihood and a considerable increase in income.

The projects ambitions to reduce average and total livestock numbers and increase the quality of the herd have not been realized, but members are more aware of the need for quality livestock that can withstand the winters and produce high-value wool and milk. They mentioned this in interviews as a new focus. The qualitative analysis showed that breeding with high-quality stock had ceased for almost all, and that the record on veterinary care was mixed. Average livestock numbers collected in the survey were similar for community and control households alike. There were no real differences found for breeding or veterinary care.

With regard to pasture management, the changes induced by the project are still visible. Community households discuss pasture management decisions more than other herders, although the share of them who discussed decisions with the community organization was relatively small. In the interviews and group discussions, positive things were still heard about making more seasonal moves. A small number of people in the survey answered similarly, but the main trend seems to be that people are simply forced to migrate more because of the weather and resulting grazing conditions. Making long treks, or *otor*, was possible for a slightly higher share of community members, possibly because they could divide the labour. Member households were also more likely to reserve winter pasture, and more able to prepare and buy hay and fodder to feed the animals during the winter. The latter was also mentioned in the focus group discussions, but people said this had gone down compared to when the project was running, mainly because they lacked the money or materials to put up fencing. Finally, the qualitative assessment found that communities had been very active in restoring (natural) water sources and digging new wells. The survey, however, showed that only about 10 percent of the people saw a positive change in the availability of water sources. The large majority did not see a change, or thought the situation had even deteriorated. In this respect, member and non-member households did not differ. While the community households still seem to pay more attention to overall pasture management and winter preparation, the animal loss rate during the last *dzud* was similar between both groups. In a disaster, apparently this was not enough. Also, despite the efforts mentioned above, people said that there had been no lasting visible effects on the pastures, but they blamed this mainly on the weather and mining operations, and said the project had done a lot to improve things.

Other effects within the *Opportunities* dimension were on the access to credit and education. While it became clear in the group discussions that the institutions the project helped establish to provide credit (the Buffer Zone Council and community funds) hardly operate anymore, the survey showed that many more community member households took out credit than non-members. While credit is now obtained almost exclusively from banks, the project perhaps acquainted community members with the idea and procedures. For education, the project and community organizations appear to have increased the number of university students among community members.

On the second dimension, *Empowerment*, some impacts have lasted, while others have largely withered since the project ended. The relationship between communities and the administration of the Gobi Gurvan Saikhan National Park was a strong point while the project ran. The relationship was bad at the start but improved significantly thanks to the efforts of the project to involve the local people in the management of the park. However, in the group discussions and several interviews, the relationship was said to have become much weaker. The park staff now almost exclusively goes after illegal miners in the park, and communication between them and the communities has largely broken down. Many of the park staff who were trained by the project have also left. Nevertheless, the survey results showed that respondents from the communities still felt better about this relationship than non-community members.

A similar story can be told about community-government cooperation. While much improved during the project, and praised by the communities as one of its main benefits, the replacement of many (trained) local government officials after elections and poor handing over to the newcomers reduced communication between government and communities. It did not disappear though. During the *dzud*, community organizations appear to have facilitated the delivery of relief aid by the government,[44] and several current government officials mentioned that community organization still made their work easier. The survey revealed that community members did not feel more able to influence local government than non-members, nor did either group differ in their perception of how this had changed.

Probably the strongest specific effect, and the most resilient, has been the change in the position of women. This came out very clear in both the qualitative and quantitative analyses. Women generally took strong positions in the management of the communities. Women's activities generally increased and became much more varied. Their skills also increased as much of the practical training given by the project focused on them.

Finally, on the dimension of *Security,* the project had some important impacts on social cohesion. The survey attempted to measure this by asking about pasture and water conflicts, and this did not turn up anything significant. But then social cohesion is hard to measure in numbers. The qualitative part of the study was a lot more informative. First, through the cooperation in the different project activities, people became much closer, and everyone said that the main benefit of the project had been teaching people to once more work together. Community-members competed together in expos to sell their products, and in local sport events and other festivities, and this created shared pride in their group efforts. The community organizations also involved non-members in organizing *soum*-wide activities. Again, these effects have diminished as many communities stopped or became less active.

[44] Much of this aid, mainly in the form of hay and fodder was donated by international donors, but distributed through government channels.

Effects on health are small and indirect. There appear to have been some secondary effects through improvements in people's diet thanks to increased vegetable growing, and a generally raised awareness also affected health issues. However, no direct link could be found in the survey between access to health care and membership of a community organization. It should be kept in mind that the project did not have a direct health focus.

6 PROJECT DRIVERS AND SUCCESS FACTORS

The most frequent answer to the question about why the GTZ project and organized communities had been able to achieve what they did, was: "*because the project taught us to work together*". Almost as frequently, people said the GTZ team had been very good and very present. To dig a little deeper to get at what some respondents called 'the reason behind the reason' was not always easy, but after some probing, participants in the focus group discussions and interviews could mention a considerable number of factors. These have been subdivided into three levels: external factors, the project approach, and community characteristics.

6.1 External factors

Climate and weather events

The challenging weather conditions of the Gobi Desert very much influence the lives and opportunities of the people living there. Several people mentioned that the project's timing had been perfect, because after the 1999-2001 *dzud*s many herders had lost livestock, and this made them realize the need for cooperation. Others said that the timing was only good for its livelihood activities, but not for pasture management improvements, because after so many animals had died no one was very worried about overgrazing and pasture degradation.

But where the 1999-2001 *dzud*s might have helped to kick-start community organization, the 2009 *dzud* seems to have dealt it a severe blow. While it was again mentioned that this disaster helped people realize they have to work together, it at the same time left many herders without animals or hope of recovery, and made them move to *aimag* centres or Ulaanbaatar, leaving their communities behind. Since the project ended, a number of consecutive droughts had already loosened intra-community bonds as people were forced on long distance treks to different places.

The latest *dzud* also seemed to have been too severe for the community organizations to deal with by themselves. Several communities had emergency funds before the *dzud*, and they were used exactly how they were intended, to buy hay and fodder, but this was not enough and many animals died anyway. For these communities, this completely drained the community fund which had been an important binding factor.

The structural changes in the Gobi climate, getting dryer and hotter, also had direct negative effects on some of the activities that the communities engaged in together. Many of the vegetables, wheat and trees planted against desertification did not survive the past four years. Droughts also made the attempts of some communities to protect saxaul plants futile, as the plants died due to a lack of water. Water sources have become scarce in recent years; many natural water sources, such as springs, have dried up. The recent droughts and the 2009 *dzud* also led to a fall in the number of tourists, which hurt communities who had focused on this market to gain an alternative income source. Overall, the climate was indicated as a very influential factor that made bigger changes in people's lives than the project had done.

Economic development

During the project timeframe (1998-2006), general economic developments brought the communities communication media such as TV, radio and mobile phones, which kept them informed and allowed them to stay in touch with each other, plan meetings and coordinate community activities. Considering the large distances between Gobi herders, the improvement of communication had a very positive effect on the community organizations. Recently some *soum*s gained access to the electricity grid, and some herders were able to buy solar panels. The availability of a steady electricity supply has been beneficial to their businesses and storage of products. Another factor that was said to have positively affected the impacts of the project was the opening up of the Chinese border, making it easier to sell home-grown vegetables, and other products the communities produce.

A factor that negatively influenced the impacts of the project was the increasing income herders could get from gold mining and selling cashmere. It made them fall back on more goat herding, or trade in their pastures (and communities) for digging holes in search of gold. Gold mining also caused animals to fall into holes left by the miners, and the digging and use of chemicals to wash the gold degraded pastures and water sources.

6.2 Project implementation

Three things stood out in the project's approach that were frequently mentioned as having contributed to its achievements. First, the openness of mind with which the project approached the herders and adapted the project to their needs. By involving as many herders as possible and by visiting all of them to assess what their needs were, the herders were given an equal opportunity to contribute ideas on what the project should offer them, and this was much appreciated. After providing some training, the project let herders write proposals for funding from the project. The best proposals were granted without focus on certain activities, as long as the proposed activities contributed to the project objectives of conservation and sustainable livelihoods. It was local demand-driven development. Another very important characteristic of the project was that community organizations themselves had to make a contribution for the things they wanted. As mentioned by one community member "*they didn't just give us things, they taught us to organize ourselves and achieve things together*". This made them both ask for the things they really needed, and it made them value these things more. It created ownership.

The second factor was the involvement and bringing together of all stakeholders in the region: the local herders, local government, the park administration, and regional and state government. The trainings given to government officials and national park administrators increased their capacity to write funding proposals, make pasture management plans, and enabled coordination and cooperation between government and communities. At the state level, through the actions of a South Gobi Member of Parliament who had become aware of the project, clauses were added to the relevant legislation on community organization, which gave communities official legal status. This was the beginning of developing the legal environment for community-based natural resource management and for engagement of rural civil society in social and environmental issues.

The cooperation with the national park administration got the herders to assist with wildlife monitoring and other conservation efforts. By involving the *aimag* government in the organization of expo's, communities gained exposure for their products and access to new markets. Of course, this did not all work perfectly. Some

communities complained that government officials were corrupt and, for instance, gave out licenses for trophy hunting, which discouraged the communities involved in wildlife monitoring. Others complained that the government allowed mining that had a negative impact on the pastures.

The third factor was the commitment of the project team to be there in the field. At the start of the project, herders saw the project as foreign and were worried that the foreigners had come to take away their land. However, because the project team resided close to the herders and worked with them on a local level, rather than from the capital, this made herders more closely connected to the project team and encouraged and motivated them. The project's organization, in which there was a community organizer in each *soum* who regularly visited and motivated the communities, also helped with this. As proof of the commitment and local ownership of the project, some of these community organizers are still active, even without pay.

Additional factors that were mentioned as beneficial were the combination of trainings with the provision of the necessary materials and equipment, and especially the focus on knowledge exchange between herders themselves. Besides training and using local trainers to teach the courses, the project also organized workshops, in which successful organizations told other Mongolian herders what and how they had done things. Moreover, the project sent community members abroad to participate in international conferences and events. People said they had learned a lot from these experiences. Perhaps even more importantly, it gave them a sense of pride in their pastoral lifestyle and traditions, and they saw there were other people in the world facing similar problems.

Criticism of the project's approach was also heard, mainly related to how it ended. Unsurprisingly, people felt the project had ended too soon, and that the communities had only just gotten started. As one interviewee said, *"the communities were like toddlers, they needed to learn everything from scratch*". Many wished that the community organizers had remained active, because this person's job was to check on the communities and keep them informed and active. In the project's design, local government was supposed to take up these tasks, but because of elections, many of the newly elected officials were not knowledgeable about the communities and did not support them. People also said that marketing contacts had not always been handed over properly by the project team to the communities. The project had become a 'bridge' between communities and outside markets, and contacts were lost with the termination of the project. Another element of the project that received criticism was the functioning of the Buffer Zone Councils and their role as providers of micro credits to communities.

6.3 Secrets for a successful community organization

About two-third of the respondents' first answer to the question 'what are the secrets to a successful community?' was 'cooperation'. Being a team and sharing labour and costs to implement activities was perceived as the most critical component of a community organization. For this, it was important that the community had a common goal and internal trust. Many communities said that the lack of a common goal had hindered the success of their group. Trust was also important for herders to be able to invest in common properties, such as storage facilities for vegetables and fences for pastures. In turn, these investments held communities together, as people did not want to leave their investments behind. A lack of trust or a common goal were sometimes attributed to having too many different types of people in a group. For some community organizations, it worked to have only family members or neighbours, but others mentioned that their familiarity had had no influence on their success.

The qualities of the community members and leader were also said to be very important. Community members had to be willing to work hard, be motivated and show initiative. Many herders said that those who were no longer active did not have the true motivation to improve their lives and were not committed to work together with others. The community leader also had to be active and skilled. GTZ trained the community leaders in management and communication, but the person must also possess certain qualities, such as organizational capacity and negotiating skills to look after the interests of all community members. Unfortunately many community leaders – and community organizers – have recently moved to the private sector, which limited the project's sustainability.

To be involved in activities that led to increases in income was also deemed important, although this was not mentioned so much by the herders themselves. Perhaps this is because the income from their alternative livelihood activities is relatively small. Even though this was very much appreciated, as shown in the qualitative analysis above, it remained too small to make them less dependent on their livestock. Longer project support to expand and professionalize alternative livelihood activities would have been beneficial. As commented by the former project leader, at the end of the project, the most successful community organizations were starting to need another kind of help to scale up and professionalize their activities. Mere community organization and knowledge exchange were no longer enough.

To have a working community fund was also said to have had an impact. The fact that herders helped financed their own fund made them realize that they had to use the money for a good purpose benefitting the whole community. Most communities used up their fund last winter to buy hay and fodder for their livestock. This helped animals survive, but it depleted the funds. The herders currently have no financial means to re-start their community funds, which also takes away the opportunity for micro credits. Only those who did not fully spend the fund last winter and who have donated income generating assets to their community fund, such as goats and crops, will continue to reap the benefits from their community fund.

7 CONCLUSIONS

The main impression left after the field work was the very cooperative and positive manner in which almost all local participants in the study, were they community members, park staff, former project team members or local government officials, reacted to the study and the team. Despite the hardship most local herders had suffered during the last *dzud*, which was clearly visible in the remaining carcasses along the roads, or people's lack of dried curd, cream and *airag*,[45] people were eager to talk about the project. This does not mean that only positive things were said, but their eagerness is already an indication of the effect the project had on people.

It is clear from the previous sections that the project had a beneficial effect on the local livelihoods of the herders around Gobi Gurvan Saikhan National Park and on the ecological status of the pastures managed by them. No doubt, this effect had been even greater in 2006 when funding for the project ended. There were three main reasons why the level of success was not kept up. First, the push factor of the project team obviously disappeared when the project stopped. One of the success factors of the project was the commitment of the team to be on the ground. Its organizational strategy, in which every *soum* had its own community organizer who stimulated the communities and functioned as a liaison between them and the rest of the project team was cited by many as very beneficial. In some *soum*s, while no longer being paid by the project, former community organizers are still involved with the communities and even continue to give trainings and help set up new communities, but they do this at a lower level than during the project. Despite this voluntary continuation, which is proof of the commitment of the team, the push factor has clearly weakened, and funding to implement activities has stopped.

The second reason for the decline of the impacts was that two of the three partners in the project-organized co-management of the pastures, the local government and the park staff, became less involved. Many local government officials who had been trained and involved actively by the project were replaced after elections and the established links with the communities were not handed over sufficiently. The park staff started going after illegal gold miners in the park, and also reduced its intensive cooperation with the communities. The involvement of all stakeholders had been an important element of the project, and another of its success factors.

Third was the weather. In the years after the project stopped, the area was hit by a number of consecutive droughts, on top of which came the 2009-2010 *dzud*. The need to move with the animals to places where it had rained meant communities became separated and could not continue with their joint activities. This caused many of the groups to become less active or simply to fall apart. Because of the *dzud,* many households lost all or most of their livestock, which made some of them migrate to *aimag* centres or even to Ulaanbaatar. The people who stayed behind had also lost many animals, and the animals that did survive produced few livestock or other products. They, therefore, had fewer reasons to come together and process these products. This last reason, the weather, obviously is not linked to the termination of the project, as is the case for the first two reasons. Even if the project had not ended and would have been able to prevent or solve the problems discussed above, it would have been difficult to deal with the weather-induced problems. The Gobi desert is a largely non-equilibrium ecosystem, where the weather has a greater impact on the pastures than does their management. The communities would most likely have been stronger had the project not ended, but as was

[45] Fermented mare's milk.

said several times during the field work, this disaster appeared to big too be dealt with by community organizations alone.

Two of the three main success factors of the project have been mentioned in the description above. The third, the genuine bottom-up or participatory approach of the project, in which the herders themselves had a real say in what the project offered, was at least as important as the other two. It was what made the herders see this as *their* project, and is most likely the reason why some of the project team's community organizers continue with their work, even though pay from the project stopped long ago. It is also most likely the reason why some of the impacts that were found in this study were still there to find, despite the headwind the community organizations encountered. The project helped develop what the local people wanted to develop themselves, and they have tried to continue it by themselves.

The three success factors of this project are well known within the conservation and development communities: creating ownership, involving all stakeholders, and being there on the ground. Perhaps this project had its successes because it actually implemented them.

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Appendix I ANALYSIS PROCEDURE OF THE ECOLOGICAL ASSESSMENT

Year 2000-2009 MODIS Analysis Methodology

1. The area as a whole was analyzed to see general trends of Community Conservation Sites versus Non-community Conservation Sites.

2. A subsetting tool provided by NASA was used to extract the NDVI statistics for the chosen sites (MODIS ORNL DAAC - http://daac.ornl.gov/MODIS/modis.shtml). This tool precludes the need to download 10 years worth of data (Gigabytes worth) and substantially cuts analysis time.

3. Data were used from Year 2000 (Jan) to 2009 (December).

4. Data points for each site (76 in total) of the study are compiled as follows:

    a. Each site is comprised of a 9 pixel by 9 pixel area (each pixel is 250m x 250m in size), which is equal to 2.25 x 2.25km or 62.05 hectares.

    b. Each pixel is comprised of a bi-weekly NDVI summary of a daily NDVI measurement.

5. Growth season dates (1st period-May to 2nd period-September) were used to calculate seasonal growth rates.

6. Rainfall statistics for the overall area was obtained from the NASA Monthly Global Precipitation tool (NASA GPCP 2010). The resolution of the data is 2.5 degrees (about 4.5 x 3.25km), and monthly rainfall statistics are available from 1979 to September 2009.

Year 1982-2006 AVHRR Analysis Methodology

1. As with the MODIS methodology, the area as a whole was analyzed to see general trends of Community Conservation Sites versus Non-community Conservation Sites.

2. The Global Inventory Modeling and Mapping Studies (GIMMS) data set was used for this analysis, and downloaded from the University of Maryland's Global Land Cover Facility (GLCF – www.landcover.org). GIMMS is an NDVI product available for a 25 year period spanning from 1981 to 2006 (1981 was excluded as it is only available for the last 6 months). The data set is derived from imagery obtained from the Advanced Very High Resolution Radiometer (AVHRR) instrument onboard the NOAA satellite series 7, 9, 11, 14, 16 and 17. This is an NDVI dataset that has been corrected for calibration, view geometry, volcanic aerosols, and other effects not related to vegetation change (Tucker *et al.* 2005).

3. The GIMMS data is compiled at a resolution of 8km x 8km pixels (summarized from original 1km and 4km data).. The data is far less focused than the MODIS data allows, so AVHRR NDVI statistics are not directly comparable to the MODIS data. However, general NDVI patterns are similar between the two sensors – especially the growth season, and the high and low TI-NDVI years.

4. Data points for the study sites had to be carefully screened so that overlapping sites where excluded (more than one site occurring per pixel) – those sites where excluded.

5. Resulting pixels had to then be analyzed to exclude those pixels that included montane coniferous forests. The forest NDVI signal would overwhelm any arid-land growth NDVI signal, causing a biased result.

6. After both filters were applied, 36 viable sites remained – 18 Community Conservation Areas and 18 Non-community Conservation Areas. NDVI Data for each site pixel was extracted and analyzed.

7. Growth season dates (2nd period-May to 1st period-October) were used to calculate seasonal growth rates. AVHRR data has a two week delayed reaction to plant growth, and so a later season was used to capture all possible summer growth.

8. Data was analyzed according to each decade, which corresponded to the Soviet controlled era (1980s), post-Soviet and pre-conservation intervention (1990s), and conservation intervention era (2000s).

9. Rainfall statistics for the overall area was obtained from the NASA Monthly Global Precipitation tool (NASA GPCP 2010). The resolution of the data is 2.5 degrees, and monthly rainfall statistics are available from 1979 to September 2009.

Appendix II LOW TI-NDVI YEARS

Low TI-NDVI years			
Year	**Communities**	**Non-Communities**	**% Difference**
1983	14180	13629	
1984	12505	12813	
1985	12134	12875	
1986	12268	13307	
1989	11191	9201	
1991	11910	12212	
1995	13712	13159	
1996	12059	12430	
1997	13489	13959	
Total	**12605.33**	**12620.56**	**99.88%**
2001	12852	10645	
2002	13766	12049	
2004	12065	11123	
2005	10910	9631	
Total	**12398.25**	**10862**	**114.14%**

Appendix III KEY INFORMANT INTERVIEW QUESTIONS

Target group: *aimag*, *soum* and *bag* officials who are responsible for range land management and planning and social issues (governor, vice governor, social officer, agricultural officer), buffer zone council, Gobi Gurvan Saikhan National Park Administration, community organizer, buffer zone council members.

Reason for the research

This interview is part of an independent research project that aims to identify if and in what ways community organization and the GTZ project have been a success to local livelihoods and conserving nature. The aim of this interview is to identify to what degree the GTZ project has been successful from a socioeconomic point of view, and to identify key success factors that explain why it was successful.

Introduction of respondent

1. Can you introduce yourself (name, organization, department, position, how long)?

2. How were you involved with the project through your work?

Impacts

3. What have been the achievements and negative impacts of community organization and the GTZ project?

   If not covered, enquire how community organization and the GTZ project contributed to:
   - pasture management
   - quality of the pastures
   - social cohesion and participation in the community
   - the role and participation of women

4. Have the impacts that you mentioned stayed or changed after the GTZ project ended in 2006?

5. What is left of the benefits after the last *dzud*? Are the alternative livelihoods offered by GTZ sufficient for people to better cope with difficult times?? Do people still practice better pasture management?

Success factors

6. Why could the project achieve the benefits you just mentioned? Were there specific characteristics how this project was implemented that made it successful?

7. What outside factors and conditions helped to make the project successful?

8. Do you know of any-one within or from outside the community who had objections against the project?

Negative aspects

9. What were difficulties to implement the project?

10. How could the sustainability of the project have been improved?

11. Should the GTZ project have done things differently?

12. Do you see negative effects of the establishment of community groups on conservation or livelihoods?

13. Do you see differences between non-organized and organized households in livelihoods and attitude towards conservation?

14. Why have some communities stopped being part of a community group?

15. Some years ago, during the project, training was given on improving the quality of the herd. Do people who have become better-off improve their herd quality or do they increase their herd? Why? Does not this lead to more degradation? How to deal with this?

Appendix IV FOCUS GROUP DISCUSSION PROTOCOL

1 Introduction & icebreaking

Facilitator introduces the team and explains:

Reason for the research

Objective of the meeting

Rules:

- Ask participants what should be the rules. Rules are written down.
- Everyone's opinion counts, listen to each other.
- Trust each other: nothing what is said will leave this room
- Let people finish talking. No dominance allowed.
- Please answer as truthfully as possible. There are no right or wrong answers.
- Complete confidentiality: your names will not be revealed, individual statements will be linked to participant numbers

Participants introduce themselves

- Ask participants to briefly explain who they are and what is their role in the household?
- Ask if the participants about their role in the community organization and when their household joined the community?

2 Brainstorming

Round 1: Open question. Ask participants to write down on cards what have been the 3 or 4 major effects of their community organization and the GTZ project on their lives and on the community (life in general in the *soum*) – these can be both positive and negative.

Give people time to think and write on the cards.

Participants present what is on their cards.

Round 2: The facilitator and one or two participants cluster the answers on the cards on a wall according to the following 7 groups:

A health
B education
C pasture & animal management
D governance & social cohesion
E the role of women and men in the household
F livelihoods & opportunities
G other

If not all clusters are mentioned by herders on the cards, then the facilitators may also include some cards.

3 Scoring and ranking

The identified clusters with effects that were written down by the herders will now be scored for 2006 (height of the project) and 2009 (after project ended) and ranked. High score means that the cluster of effects is important. If the same scores are given, pair-wise ranking will be applied. Rank is determined by taking the average for 2006 and 2009.

	A	B	Cj	D	E	F	G
Score 1-10							
Rank							

4 How and why?

- Open discussion about the changes that were written on the cards.
- The facilitators start with the highest ranked cluster. To help the discussion, sample questions for each cluster are listed below for each indicator.
- Notes will be written on the board with the cards by facilitator and herders.
- Review the notes, do all agree? Notes will be taken on when people disagree and why.

5 Reason why things happened

1. What do successful communities have in common? What makes then strong and effective from the inside?
2. What outside factors and conditions improve and support community organization and help them to be strong and effective?

6 Wrap-up

- Summarize the main outcomes and check if this summary corresponds with participant perception of the main outcomes from the discussion.
- Ask participants how they felt about participating in the meeting
- Are there any remaining issues they would like to mention?

Sample questions:

Education/new skills

1. Has community organization and the GTZ project changed in any way your ability to send your children to school (can be about costs/organization)? How?

2. Has community organization and the GTZ project contributed to teach children in this community about any cultural or traditional values, such as pastoralist practices or environmental conservation?
3. Has community organization and the GTZ project helped members of this community to learn new skills (organizational, food processing, handicrafts)? How important has this been? Why?

Health

4. Has community organization and the GTZ project changed the access to health care for your household? How?

Pasture and animal management

5. What has been the effect of community organization and the GTZ project on pasture management?
6. What has been the effect of community organization and the GTZ project on the quality of the grasslands?
7. Has the formation of community organizations improved or restricted the movement of herders? How?
8. What do you think is a better strategy for herders: increasing the number of animals, or improving the quality of the herd? Why? Do you follow this strategy? Do others follow this strategy?
9. Has the formation of community organizations changed the entry of outside herders to the communities pastures? How?
10. Did community organization and the GTZ project change your ability to deal with bad weather events, such as drought and *dzud*? How?
11. How important is veterinary care for your herd and income? Has community organization changed your access to veterinary care? How?
12. Has community organization and the GTZ project changed the access to water? In what way?
13. Has community organization and the GTZ project changed the production and availability of hay and fodder for households? In what way?

Governance and social cohesion

14. Have community organization and the GTZ project changed your relationship with the local - *bag* and *soum* – government? How?
15. Have community organization and the GTZ project changed your relationship with the state government? How?
16. Have community organization and the GTZ project changed your relationship with the Gobi Gurvan Saikhan National Park administration? How?
17. Do you feel that in general you can influence decisions within the community organization?
18. Does everyone participate equally/ have an equal say in decisions made by the community organization?

19. Do you feel that in general community members are properly informed about decisions within the community organization?
20. How did community organization and the GTZ project affect relationships between authorities and local citizens in the *soum* (governance, activities together, other…)?
21. Did the establishment of your community organization increase or reduce conflict between community members? What kind of conflicts?
22. Did the establishment of your community organization create more conflict between neighbouring communities or did it reduce them?
23. Did the way conflicts are resolved change?

Role of women

24. Have community organization and the GTZ project changed the role of women (in household/income provision/pasture management/community participation/ decision making in the *soum* and community/ government position)? How?
25. Have community organization and the GTZ project changed the position of men in the general community (men no longer to community meeting)? How?
26. Did community organization and the GTZ project change anything for the young people in your community?

Livelihoods and opportunities

27. How have community organization and the GTZ project changed how much income you have (can you more easily buy the things you need)?
28. Has community organization or GTZ changed your income sources (new sources of income, such as from tourism, handicrafts, trainings, vegetable growing, other…)? Are you now less dependent on income from only livestock?
29. Has the establishment of the Gobi Gurvan Saikhan National Park changed the amount of your income or your income sources?
30. Have community organization and the GTZ project changed how or where you sell your products (less dependent on traders)? How?
31. Have community organization and the GTZ project changed the availability of credit for households (from *soum* centre bank, community fund, other…)? Why?

Other

32. What other impacts did the GTZ project have on your family and community?
33. Has the community organization had any negative effects on your household or the wider community?

Appendix V OVERVIEW FOCUS GROUP DISCUSSIONS

FGD No.	# of participants	# of communities	Gender composition	Level of activeness and organization
1	8	2	All men	Active GTZ-established
2	12	3	All women	Active GTZ- established
3	15	1	All women	Active GTZ- established
4	4	1	Mixed	Inactive, self-established
5	6	1	All women	Half-active, self-established with GTZ support
6	7	1	Mixed	Active GTZ- established
7	6	1	All men	Half-active, self-established with GTZ support
8	9	2	Mixed	Active and half-active GTZ-established

Appendix VI HOUSEHOLD SURVEY QUESTIONNAIRE

Household Survey Questionnaire

<FILL OUT THE DATA BELOW BEFORE THE INTERVIEW OR DIRECTLY AFTERWARDS!>

Name of the interviewer		**Household ID code**	
Date of the interview (yr/mn/dy)		Start time of the interview	
Location of the interview (bag)		Finish time of the interview	
Local area name		Coordinates: latitude	
Herder community name		Coordinates: longitude	

INTERVIEWER INSTRUCTIONS

<INTERVIEW ONLY HOUSEHOLD MEMBERS WHO LIVE IN THE HOUSEHOLD >

<INTERVIEW ONLY ADULT HOUSEHOLD MEMBERS (18 YEARS AND OLDER)>

<INTRODUCE YOURSELF :>

This is an independent research project from the Institute for Environmental Studies from the Netherlands to investigate the livelihoods and changes in the livelihoods of people who depend on grasslands in three countries: Kenya, South Africa and Mongolia. The goal of the project is purely research; to compare and better understand the issues that affect the daily life of pastoral people in these countries so we can learn from their experiences.

I'm going to ask you a number of questions related to your household. Please note that any information you give me will be treated completely confidentially and not shared with anyone else. The information will only be used to characterize the area in which you live. All individual information will be added together to determine the average for the whole community, so nobody will be able to identify individual participants.

The interview will last about 1 hour.

There are no right or wrong answers.

Comments interviewer:

.....

.....

.....

1

1. HOUSEHOLD SITUATION, ACCESS TO SERVICES, AND ASSETS

Please help me to make a complete list of the people who normally live and eat their meals together in this household, starting with the household head, then the immediate family and then the extended family. Please also count children who are living in school dormitories or with relatives, but for whom you pay the living and school expenses.

ID CODE	1. NAME <MARK THE ID-CODE OF THE RESPONDENT >	2. SEX MALE.....0 FEMALE .1	3. What is the relationship of [NAME] to the household? <USE RELATIONSHIP CODING FROM BOX 1 BELOW>	4. AGE <IF YOUNGER THAN 6 OR OLDER THAN 25 SKIP TO Q6>	5. Is [NAME] attending school now? NO... 0 YES...1	6. What is the highest completed level of education by [NAME]? <ONLY ASK IF AGE IS 12 HIGHER> <USE CODING FROM BOX BELOW>
1						
2						
3						
4						
5						
6						
7						
8						
9						
10						
11						
12						

BOX 1: RELATIONSHIP CODES	
HEAD OF THE HOUSEHOLD	1
THE HUSBAND/WIFE OF THE HEAD OF THE HOUSEHOLD	2
SON/DAUGHTER OF THE HEAD OF THE HOUSEHOLD	3
BROTHER/SISTER OF THE HEAD OF THE HOUSEHOLD	4
FATHER/MOTHER OF THE HEAD OF THE HOUSEHOLD	5
OTHER (SPECIFY)	6
GRANDCHILD OF THE HEAD OF THE HOUSEHOLD	7

BOX 2: CODING HIGHEST EDUCATION LEVEL	
NO SCHOOLING	1
PRIMARY	2
LOWER SECONDARY 8TH GRADE	3
VOCATIONAL	4
UPPER SECONDARY 10TH GRADE	5
DIPLOMA	6
UNIVERSITY	7

<SKIP NEXT QUESTION IF HOUSEHOLD DOES NOT HAVE CHILDREN BETWEEN 6 AND 15>

. Do all children between the age of 6 and 15 in your household attend school? If not, why not?

0 Yes, they all go to school
1 No, because we cannot afford the school expenses (stationary, clothes, dormitory/boarding)
2 No, because we need the children to help with work
3 No, because the school is too far away
4 No, other reason (specify)……

. Is your household part of a herder group or herder community organization?

0 No >> SKIP TO Q12
1 Yes

2

9. Is any member of your household on the community organization council? If yes, who is?

   0 No
   1 Yes, namely …….. **<PLEASE USE "ID CODE" FROM FIRST COLUMN IN TABLE ABOVE>**

10. What is the name of the community organization or group?

    ……

11. In which year did your household join the herder group or community organization?

    …….. **<IF RESPONDENT SAYS SINCE X YEARS AGO, CALCULATE WHICH YEAR THIS WAS AND CONFIRM>**

12. Could you tell me where you go for medical help if one of your household members has a serious medical problem?

    0 Bag doctor
    1 Soum centre
    2 Aimag centre
    3 Ulaanbaatar
    4 Hoh hot
    5 Other (specify)……

13. What are the first and second most important sources of energy/fuel used in your household for cooking and heating? **<TICK ONLY ONE OPTION IN EACH COLUMN>**

	1st most important	2nd most important
0 Animal dung		
1 Firewood		
2 Coal		
3 Briquettes (compressed fuel)		
4 Khurcun (winter shelter dung)		
5 Other (specify)		

14. Can you tell me if your household owns any of the following items, and if so how many?

	Number
Ger	
Tractor	
Motorcycle	
Solar panel	
Satellite dish and television	
Car/truck	
House/apartment in soum/aimag centre/ UB	

2. LIVESTOCK, AND PASTURE MANAGEMENT

15. Could you specify how much livestock your household owns and herds for someone else?

	Owned	Herd
Cows/yaks		
Horses		
Sheep		
Goats		
Camels		

16. Could you specify how much livestock your household **owned** last year and ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

	Last year	Before joining/2002
Cows/yaks		
Horses		
Sheep		
Goats		
Camels		

<ONLY ASK THE NEXT TWO QUESTIONS IF THE HOUSEHOLD HERDS FOR SOMEONE ELSE. OTHERWISE SKIP TO Q19>

17. To whom do the animals belong that your household herds for someone else?

0 Relative
1 Friends
2 Other, please specify……..

18. How is your household paid for herding the animals that do not belong to your household?

0 Not paid
1 Cash
2 Food
3 Animals
4 Other, please specify……..

19. Did your household buy or exchange any breeding stock last year to improve the quality of the herd?

0 No **>> SKIP NEXT QUESTION**
1 Yes

20. How many animals did your household buy or exchange for breeding during the last 12 months?

	Number
Cows/yaks	
Horses	
Sheep	
Goats	
Camels	

21. During the last twelve months, how often did your household seek out veterinary services for your animals or buy medicine or vaccines?

    ……..times **>> IF NEVER, SKIP TO Q24**

22. What kind of assistance did you seek? **<MORE THAN ONE ANSWER POSSIBLE>**

    0 Vaccination
    1 Disease
    2 Artificial insemination
    3 Dipping (parasite treatment)
    4 Other, please specify……..

23. Could you give an estimate of how much you had to pay for the veterinary services you used during the last twelve months?

    ……..Tugrik **>> NOW SKIP NEXT QUESTION**

24. Why didn't you seek out any veterinary services during the last 12 months?

    0 No need
    1 Couldn't afford
    2 Not available
    3 Bad service
    4 Other, please specify……..

25. Thinking back to [before your household joined the community organization] **<OR IF THE HOUSEHOLD IS NOT PART OF A COMMUNITY, SAY: >** [2002, the year after the 1999-2001 dzuds] , does your household now make more, less or the same seasonal moves in a year than compared to the situation then?

    0 Less
    1 Same **>> SKIP NEXT QUESTION**
    2 More

26. If less or more, can you explain why?

    ……

    ……

27. Does your household own a winter camp, and if so, what kind of shelter does it have?

    0 No **>> SKIP TO Q30**
    1 Yes, one wall, no roof
    2 Yes, one wall and roof
    3 Yes, three walls and roof
    4 Yes, other, please specify……

28. How long have you owned the winter camp? Since:

    …….. **<IF RESPONDENT SAYS SINCE X YEARS AGO, CALCULATE WHICH YEAR THIS WAS AND CONFIRM >**

29. Does your household have a certificate for the winter camp?

    0 No
    1 Yes

30. Is your household generally able to reserve winter pasture?

    0 No
    1 Yes >> **SKIP NEXT QUESTION**

31. If not, can you explain why not?

    0 Other herders will use it
    1 Not enough pasture
    2 Pasture degraded
    3 Other, please specify……

32. Was your household generally able to reserve winter pasture ["before your household joined the community organization"] / ["2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 No
    1 Yes
    <IF THIS CHANGED, ASK NEXT QUESTION, IF NO CHANGE SKIP NEXT QUESTION>

33. Why did it change?

    0 Government action
    1 Actions of organized communities
    2 Climate change
    3 More herders migrated here
    4 Other, please specify……

34. In years that you need to do otor, is this possible for your household?

    0 No
    1 Yes >> **SKIP NEXT QUESTION**

35. Why not?

    0 No place to go
    1 No transportation
    2 Lack of manpower
    3 Other reason, please specify……..

36. Was it possible for your household to do otor in years that you needed to ["before your household joined the community organization"] / ["2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 No
    1 Yes
    <IF THIS CHANGED, ASK NEXT QUESTION, IF NO CHANGE SKIP NEXT QUESTION>

37. Why did it change?

    0 Government action
    1 Actions of organized communities
    2 Climate change
    3 Other, please specify……

38. Has there been a change in the access to water sources for your livestock compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Access has deteriorated
    1 No change **>> SKIP NEXT QUESTION**
    2 Access has improved

39. Why did this change?

    0 Government action
    1 Actions of organized communities
    2 Climate change
    3 Own initiative
    4 Other, please specify……

40. Is your household generally able to produce enough hay and/or fodder to feed your animals throughout the winter?

    0 No
    1 Yes **>> SKIP TO Q44**

41. Why not?

    0 Gobi climate not suitable
    1 Insufficient land for haymaking
    2 Other, please specify……..

42. If your household cannot produce enough hay and fodder, are you able to buy what you need to feed your animals throughout the winter?

    0 No
    1 Yes **>> SKIP TO Q44**

43. Why not?

    0 Too expensive
    1 Not available
    2 Other, please specify……..

44. Do you now generally have less or more hay and fodder than ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Less
    1 No change **>> SKIP NEXT QUESTION.**
    2 More

45. Why has this changed?

    0 Government action
    1 Actions of organized communities
    2 Climate change
    3 Other, please specify……

46. Do you feel your household is now better able to deal with dzud and drought than ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 No >> **SKIP NEXT QUESTION.**
    1 Yes

47. Why has this changed?

    0 Government action
    1 Actions of organized communities
    2 Climate change
    3 Other, please specify……

48. Did you grow any crops or vegetables in 2009 for household consumption or to sell?

    0 No >> **SKIP TO SECTION 3 PROFESSION, INCOME AND CREDIT.**
    1 Yes

49. If yes, could you specify which crops or vegetables you grew?

	Kg grown in 2009
Potatoes	
Carrot	
Onion	
Cabbages	

	Kg grown in 2009
Turnip	
Cucumber	
Tomato	
Other (specify)……	

50. Does your household now grow more or less crops or vegetables compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Less
    1 No change >> **SKIP NEXT QUESTION**
    2 More

51. Why did it change?

    0. Government action
    1. Actions of organized communities
    2. GTZ project
    3. Other projects
    4. Other, please specify……

3. PROFESSION, INCOME AND CREDIT

I would now like to ask you about the income sources of the household.
Please note that all the information you give me will be treated completely confidentially and will be combined with all the other household data in the community to determine an average!

< FIRST LIST ALL INCOME SOURCES. THEN CONTINUE WITH THE OTHER QUESTIONS PER SOURCE. INCLUDE INCOME SOURCES FROM ALL HOUSEHOLD MEMBERS TOGETHER. IF THE RESPONDENT IS NOT SURE OR DOES NOT KNOW THE INCOME GENERATED BY OTHER HOUSEHOLD MEMBERS, PLEASE ASK HIM/HER TO TAKE A MOMENT TO CONSULT OTHER AVAILABLE FAMILY MEMBERS>

52. Could you indicate which sources of income your household had in 2009? <TICK BOX IF INCOME SOURCE APPLIES>		53. How much income did you have in 2009 from the following sources? TUGRIK	54. To whom/where do you usually sell this item? FAMILY & FRIENDS... 0 OTHER HERDERS.... 1 VISITING TRADERS... 2 SOUM CENTRE..... 3 AIMAG CENTR.....4 ULAANBAATAR..... 5 ACROSS BORDER (CHINA)..... 6 OTHER(SPECIFY)..... 7	55. Can you indicate on a scale from 1-10, with 1 being not important and 10 being very important, how important this income source was in 2009 and before joining the community project/2002 after the 1999-2001 dzud. 2009	Before joining/2002
Selling live animals					
Cows/yaks					
Horses					
Sheep					
Goats					
Camels					
Selling unprocessed animal products					
Selling meat					
Selling milk					
Selling skins					
Selling cashmere					
Selling wool					
Other……..					
Selling processed animal or other products					
Dairy products.					
Handicrafts					
Briquettes					
Other……..					
Selling vegetables					
Ninja mining					
Herding livestock (not owned)					
Tourism (*e.g.,* acting as a guide, renting horses/ camels, providing housing and food)					
Money given by relatives					
Government grants/pensions/ children's money, etc.					
Job (please specify the type of job, and give info per job) a_____ b_____ c_____					
Other (please specify type of source, and give information per source) a_____ b_____ c_____					

9

56. Do you feel you get a fair price for the animals or products that you sell?

    0 No
    1 Yes >> **SKIP NEXT QUESTION**

57. If not, can you indicate the two most important reasons why not?

	1st most important	2nd most important
0 I don't have good price information		
1 I do not have transport to bring my products to good markets		
2 Traders have all the power		
3 When we have to sell, prices are low		
4 Other, please specify:		
5 Other, please specify:		

58. Is the way in which or the location where your household sells animals or products different than ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Worse
    1 Same >> **SKIP NEXT QUESTION**
    2 Better

59. Why did this change?

    ……

    ……

60. Has it become harder or easier to meet the expenses that the household has since ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0. Much harder
    1. Harder
    2. No change >> **SKIP NEXT QUESTION**
    3. Easier
    4. Much easier

61. Why did this change?

    0 Income change
    1 Expenses changed
    2 Other, please specify……

62. How many animals from your own herd did you slaughter for household food last year?

	Number
Cows/yaks	
Horses	
Sheep	
Goats	
Camels	

63. During the last twelve months, how many times did (anyone in) your household borrow money from friends, family, traders, the buffer zone council, or any other person or institution?

    ……..times >> **IF NEVER SKIP TO Q66**

64. Who did you or your household members borrow from? <**MORE THAN ONE OPTION POSSIBLE**>

    0. Family
    1. Friends
    2. Traders
    3. Buffer zone council
    4. Non-banking financial institution (micro credit inst.)
    5. Bank
    6. Community fund
    7. Other, please specify……

65. What did you use the loan(s) for? <**MORE THAN ONE OPTION POSSIBLE**>

    0. Tuition and school fees
    1. Fodder and hay
    2. Buy life stock
    3. Buy vehicle
    4. Veterinary treatment
    5. Wedding/ new family
    6. Medical expenses
    7. Other, please specify……

    >> **NOW SKIP THE NEXT QUESTION**

66. If you or other household members didn't borrow any money during the last 12 months, could you give the most important reason why not?

    0. No need
    1. The process is too difficult
    2. Repayment time is too short
    3. You can only get a loan if you have collateral, and we don't have
    4. Other, please specify……

67. Is it easier or harder today to get a loan than compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? <**SELECT ONE OF THE OPTIONS**>

    0 Harder
    1 No change >> **SKIP NEXT QUESTION**
    2 Easier
    3 Don't know >> **SKIP NEXT QUESTION**

68. If easier or harder, can you explain why?

    0 Rules/conditions changed
    1 Community organization
    2 Household situation changed
    3 Other, please specify……

4. ENVIRONMENT, GOVERNANCE, PARTICIPATION & COMMUNITY INTERACTION

69. In your opinion, how has the quality of the following components of your environment changed compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

		0. DECREASED	1. REMAINED STABLE	2. INCREASED	3. DON'T KNOW
A	Pasture grass abundance				
B	Variety of pasture plants				
C	Occurrence of medicinal plants				
D	Occurrence of wildlife and birds				
E	Condition and abundance of natural water sources				

70. How has the relationship between the local people and the Gobi Gurvansaikhan National Park administration, such as its rangers, changed compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Worsened
    1 No change >> **SKIP NEXT QUESTION**
    2 Improved

71. If it changed, can you explain why?

    0 Community organization
    1 Rangers do their work better/worse
    2 Other, please specify……

72. Who does your household generally discuss pasture management issues with, such as whether to reserve pasture, where to move to, when to move? **<MORE THAN ONE ANSWER POSSIBLE >**

    0. Nobody
    1. Neighbors
    2. Organized community group
    3. Bag or soum government
    4. Other, please specify……

73. Did this change compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 No >> **SKIP NEXT QUESTION**
    1 Yes

74. Who did you discuss pasture management issues with before? **<MORE THAN ONE ANSWER POSSIBLE >**

    0. Nobody
    1. Neighbors
    2. Organized community group
    3. Bag or soum government
    4. Other, please specify……

75. How often do disputes about the use of pasture land and water sources occur in this area?

    0 Never >> **SKIP TO Q80**
    1 Rarely
    2 Occasionally
    3 Regularly

76. If disputes occur, are they normally with herders from within the area or with people or groups from outside the area?

    0 Local herders
    1 Herders from outside
    2 Both local herders and herders from outside
    3 Don't know

77. If a dispute occurs, how do you try to solve it?

    0 Approach the soum or bag government
    1 Negotiate with each other
    2 Other, please specify……..

78. Did the occurrence of disputes change compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Decrease
    1 No change >> **SKIP NEXT QUESTION**
    2 Increase

79. Why has this changed?

    0 Available pasture
    1 Available water sources
    2 Community organization
    3 Other, please specify……..

80. Do you feel that your household can influence the decisions of the local government (bag and soum) that affect your lives?

    0 No
    1 Yes

81. Has this changed compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Worsened
    1 No change >> **SKIP NEXT QUESTION**
    2 Improved

82. Why did this change?

    0 Community organization
    1 Government officials changed
    2 Change in government attitude
    3 Other, please specify……

83. Do you feel that support from the local government has changed compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Worsened
    1 No change **>> SKIP NEXT QUESTION**
    2 Improved

84. Why did this change?

    ……

    ……

85. Are you satisfied by the role that women play in your community?

    0 No
    1 Yes
    2 Don't know

86. Has the role of women in your community changed compared to the situation ["before your household joined the community organization"] / ["around 2002, the year after the 1999-2001 dzuds"]? **<SELECT ONE OF THE OPTIONS>**

    0 Worsened
    1 No change **>> SKIP NEXT QUESTION**
    2 Improved

87. Why did this change?

    0 Government action
    1 Actions of organized communities
    2 Self-initiated by women
    3 Other, please specify……

    <<ASK NEXT QUESTIONS ONLY FOR COMMUNITY ORGANIZED HOUSEHOLDS. FOR NON-COMMUNIITY ORGANIZED HOUSEHOLDS SKIP TO END>>

88. You said in the beginning of the interview that your household was part of a community organization. How was the community organization formed?

    0. Without support/ by ourselves
    1. With GTZ support
    2. With government support
    3. With support from other projects
    4. Other, please specify……..
    5. Don't know

89. Let me read you some statements on how community organization and the German Technical Cooperation project has influenced your household. For each statement, please tell me if you disagree, agree or don't know.
<< IN CASE RESPONDENT SAYS "MAYBE" OR "DON'T KNOW" , TRY TO INSIST A LITTLE. IF THEY REALLY DON'T KNOW THEN MARK THAT. >>

		0. Dis-agree	1. Agree	2. Don't know
A	The project/CO has helped to increase my family's income			
B	Since the start of the project, we are less dependent on only livestock			
C	The project helped to improve the position of women			
D	The quality of the pastures has improved due to the project			
E	The project has helped us to maintain our culture and tradition			
F	We feel saver during hard times due to the project/CO			
G	The project has led to better access to markets to sell/buy our products			
H	The project has improved cooperation between communities and government			
I	The project has improved coordination of the movement of herds			
J	The project has restricted the entry of outside herders to the communities pastures			

90. The interview is now completed. Do you have any comments or do you think I missed something important?

……

……

Thank you very much for your time and interest in this study!

15

Appendix VII FULL INCOME TABLE

	Community		Non-community		Significance level (p-value) of difference in income amount
	Mean amount in MNT	Share in tot. inc.	Mean amount in MNT	Share in tot. inc.	
Total Income	4,281,688	-	3,379,090	-	0.100*
Cashmere	1,702,857	45%	1,670,444	51%	0.773
Selling animal products	1,069,182	16%	412,683	9%	0.002*
Government grants	614,396	21%	749,000	26%	0.243
Unprocessed animals products	369,610	8%	301,679	9%	0.205
Jobs	227,623	4%	125,760	2%	0.163
Alternative income	117,273	2%	35,556	0.7%	0.000*
Ninja mining	105,000	2%	56,667	2%	0.959
Processed animals products	71,786	1.4%	16,429	0.6%	0.007*
Money given by relatives	3,961	0.1%	10,873	0.4%	0.501

Appendix VIII PERCEPTION OF THE ENVIRONMENT

		Decrease	Stable	Increase	Don't know
Pasture grass abundance	Member	75%	23%	1%	0%
	Non-member	76%	22%	2%	0%
Variety of pasture plants	Member	57%	39%	2%	2%
	Non-member	59%	38%	1%	2%
Occurrence of medicinal plants	Member	27%	28%	1%	44%
	Non-member	30%	18%	1%	52%
Occurrence of wildlife and birds	Member	60%	22%	3%	15%
	Non-member	73%	11%	1%	15%
Condition and abundance of natural water sources	Member	78%	19%	3%	0%
	Non-member	74%	25%	1%	0%