

## Kyrgyzstan Case Study Policy Brief

**Summer pastures across the Kyrgyz Republic can provide greater economic and environmental benefits through improving pasture yields sustainably**

### Political context

Independence from the former Soviet Union in 1991 presented the republics of Central Asia; Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan, with severe challenges for land management with ensuing economic, social, and environmental crises. Driven by the historic development of irrigation projects, often unsupportable increases in livestock numbers on rangelands, and agricultural land conversion in steppe areas under communism, land degradation has become a serious issue in the region and threatens current and future livelihoods of rural populations. All countries have recognised this in the development of their National Action Plans for the United Nations Convention to Combat Desertification (UNCCD) and are currently developing their Nationally Determined Contributions for this and other UN conventions under the 2015 Sustainable Development Goals.

### Land degradation in Central Asia

Although estimates vary and can be imprecise, land degradation is claimed to be quite extensive in Central Asia, ranging from 4-10 per cent of cropped land, 27-68 per cent of pasture land and 1-8 per cent of forested land. In total, this represents 40-66 per cent of area degraded in each country. While technologies exist to remedy this, there is a need to express the problem monetarily, enabling governments to have common metrics. Decisions can then be based on likely returns on investments for different options and sectors, both for future economic development and also to safeguard and improve the livelihoods of their people.

The Economic of Land Degradation (ELD) Initiative is a global initiative that aims to support economic

understanding of sustainable land management practices. Given the specific land degradation scenario in Central Asia, a regional project was developed in 2015. This project calculates total economic values of sustainable land management approaches. It compared existing land use with specific and feasible alternatives from each country, evaluating additional ecosystem services alongside provisioning services that produce marketable goods like food and timber. By training teams of national scientists in new approaches to estimate the value of sustainable land management options, the project supports capacity building towards the establishment of scientifically informed and locally adapted practices.



## Country summary: Kyrgyzstan

The Kyrgyz Republic is a mountainous country located in Central Asia, covering 199,951 km<sup>2</sup>. The Tien Shan range covers approximately 95 per cent of the land. Mountaintops are perennially covered with snow and glaciers, and the mountains are characterised by great diversity of soil and different levels of soil fertility. The climate is sharp continental, with cold winters, hot summers, and numerous microclimates as a result of altitudinal variance. It is often called the 'Water Tower' of Central Asia, with the freshwater supply of mountain glaciers 650 billion m<sup>3</sup>, and 4.2 per cent of the country glaciated.

The total population is 6 million, with a 2016 population density of 29.7 people/km<sup>2</sup>. The Kyrgyz Republic is a lower-middle income country with GDP per capita of 1,170 USD in 2015<sup>1</sup>. Agricultural growth in 2015 was 6.2 per cent<sup>2</sup>, achieved due to good harvest, but also from subsidised loans. Real GDP has been volatile, mainly due to external factors such as fluctuations of world raw materials markets and financial flows from abroad. Predominantly raw agriculture products are exported, including fruits and vegetables such as potatoes, apricots and beans. Average monthly wage in 2014 was USD 232<sup>3</sup>, and with low economic growth, poverty is relatively high and stable. Agriculture is one of the priorities in the National Development Strategy for 2013-2017, however land degradation and soil erosion are increasing because of unsustainable land use practices and lack of government investments.

## Challenges

High altitude pastures and grasslands are important part of mountain ecosystems and provide habitat for wildlife, as well as a variety of ecosystem services for human populations<sup>4</sup>. They account for 85 per cent of all agricultural land, with 8.9 million hectares. The vegetation is highly diverse, and a locus for numerous species of medicinal, honey, and decorative plants. It is also a natural habitat and source of food for many wild animals. Locally, people mostly use these pastures for grazing livestock, tourism, and cultural celebrations.

The health of these ecosystems is directly linked to local economic welfare and the land use policies in place. The break-up of the former Soviet Union and resulting introduction of market economy principles established new institutional frameworks that did not incorporate the sustainable use of natural resources. Vast privatisation, sharp declines in income, and ensuing poverty left few survival options. Livestock breeding is most common, and as a result of growing pressures on land, the first two decades post-independence saw high levels of pasture degradation<sup>5</sup>. Soil erosion is a particular challenge for modern Kyrgyz agriculture. All agricultural areas of the republic are considered potentially vulnerable to erosion, with 6.43 million hectares affected, including 0.77 million hectares of arable land and 4.55 million hectares of pastures. 5 million hectares are also affected by wind and water erosion - 45.7 per cent of the total agricultural land<sup>6</sup>.

The overall deterioration of these areas is ultimately due to excessive stocking rates, unsystematic overgrazing,



Map of Kyrgyzstan. Source: Wikipedia



and a lack of investments into improvement. Overgrazing negatively affects ecological health and threatens biodiversity and can lead to destruction of turf, pasture plants, soil structure, and further vulnerability to erosion and land degradation. It results in yield declines: average pasture yields decreased by 14 per cent from the 1970s to 1990s. In 2015, 70 per cent of pasture were degraded lightly to severely<sup>7</sup>. This leads to the disappearance of plant species, unique landscapes, and biodiversity.

Additionally, livestock are now often left to graze at spring and autumn pastures near villages, creating a greater burden, as animals grazing continuously in the same location leads to soil compaction and reduced water infiltration. This leads to further degradation of village grazing lands<sup>5,7</sup> and without adequate management, reduces vegetation, bares the soil, and accelerates erosion. However, livestock breeding is a core income generating activity for the majority of the population, especially rural ones<sup>8,9</sup>. Livestock is used to generate income through sale of its products, such as meat, milk, and skin. Additionally, it is seen as means of saving and wealth. Addressing these challenges requires re-thinking the costs of current land use practices, and the possible benefits of alternative and sustainable land use scenarios.

## Research and findings

Extensive household level interviews took place in the summer of 2016, with survey data used to calculate costs and benefits of highland pasture use. This has been supported with data from the *Kyrgyzgiprozem* (Land Use Planning Institute of the Ministry of Agriculture), to derive an understanding of government-approved production functions of fodder and sustainable pasture loads. Ecosystem services, and alternative scenarios for sustainable land and pasture management have been analysed from an economic point of view.

Three pilot sites with summer pastures were selected based on high levels of land degradation alongside local dependence on land and land-based ecosystems for subsistence and income, including;

- Chon Aksuu watershed
- Kyzyl Unkur municipality
- Son Kol Lake highland pastures

Cost-benefit analyses were performed on the baseline scenarios and two feasible alternatives: i) higher pasture yields through improved pasture management alongside favourable weather, and ii) moderate pasture



yields through improved pasture management alongside unfavourable weather, both scenarios inclusive of carbon storage and sequestration. Yields in the baseline scenario decrease by 2.5 per cent annually, in the first alternative increase 5 per cent annually, and in the second alternative increase 2.5 per cent.

*Chon Aksuu watershed* is located in the north-east, covering just over 50,000 hectares. Income is mostly derived from livestock breeding, tourism at Issyk Kol Lake, agriculture, and forest products, including mushrooms. Current pasture management (business-as-usual) sees a decline in fodder yields alongside increasing land degradation.

In the first scenario, total benefits over a ten year period are USD 69.1 million, and the cost-benefit analysis shows a net present value of net benefits in addition to the baseline of USD 9.4 million at a 10 per cent discount rate. In the second scenario, the cost-benefit analysis shows a net present value of USD 7.8 million at a 10 per cent discount rate.

*Kyzyl Unkur municipality* is located in the south, and is a mix between forest and pastures, in silvo-pastoral systems which serve as the primary source of income, particularly the walnut forests. There are five villages that have the highest poverty rates in the country (52.5 per cent). Business-as-usual has resulted in an increase in animal husbandry and as a result, land degradation.

In the first scenario, the cost-benefit analysis shows a net present value of USD 4.1 million at a 10 per cent discount rate. In the second scenario, the cost benefit analysis shows a net present value of USD 1.6 million at a 10 per cent discount rate. The introduction of tourism, which is currently lacking due to poor access, can see up to USD 1.1 million after 10 years.

## Key facts



Making changes towards sustainable land management, including pasture rotation, training and capacity building, fencing, seed provision, and infrastructure investments, alongside favourable weather conditions, can see increases in yield of up to 5 per cent (first alternative scenario). Even moderate improvements can see up to 2.5 per cent increase in yield productivity, whereas business as usual is -2.5 per cent

*Son Kol Lake highland pastures* are near the lake of Son Kol, covering 108,000 hectares. The pastures are some of the oldest, and serve the local population of 100,000 primarily through livestock support, which is 70 per cent of agricultural income. Current land use practices are seeing a rise in land degradation from overgrazing, with a spread of non-edible grasses and annual decline of 2.5 per cent in productivity.

In the first scenario, the cost benefit analysis showed a net present value over a ten year period USD 19.2 million at a discount rate of 10 per cent. In the second scenario, the cost-benefit analysis showed a net present value of USD 12.2 million at a discount rate of 10 per cent.

Economic numbers above are only valid if carbon value is included. Benefits are much lower if only part of the picture is taken into consideration rather than a complete one.

This is the first study in the Kyrgyz Republic and one of few in Central Asia to assess the value of pasture ecosystem services with cost-benefit analyses. The study shows that although they provide a number of valuable ecosystem services, highland pastures have been intensively used in a way that threatens long-term sustainability, with pasture degradation occurring across all three sites studied here. If appropriate measures are not taken, the natural resource base will be depleted and the quality of life for local populations will be harmed. As degradation has numerous drivers, a range of activities alongside sustainable land and pasture management should be implemented. Further research could go further by including the values of other non-market services, such as cultural value and biodiversity.



In Chon Aksuu watershed, sustainable land management can create a net present value of USD 9.4 million over a ten year period, at a discount rate of 10 per cent.

In Kyzyl Unkur, this value is USD 4.1 million, and in Son Kol is as high as USD 19.2 million.

## Recommendations

On the basis of our research, we make the following recommendations to support informed policy or decision-making on sustainable land management in the Kyrgyz Republic;

**Implement sustainable pasture management practices, with carrying capacities clearly identified and strictly observed.** This should include measures of pasture rotation, seeding and re-cultivation, vegetation survey, forage analysis and soil analysis. Local populations must be informed about the limits and current state of the pasture.

**Root economic understandings in holistic and complete perspectives of benefits derived from land and land-based ecosystems.** For instance, carbon storage is now a key international issue affecting local populations and it is important to consider potential sources of income for local populations associated with its storage.

**To further develop institutional capacity of pasture committees.** At the moment, committees are concentrating efforts on pasture access and infrastructure. However, they should equally conduct monitoring of pasture health and carrying capacities, and develop capacity to support economic valuations of the land and land-based ecosystems.

**Increase livestock productivity to reduce pressures on pastures while maintaining economic benefits for**

**farmers.** Productivity is currently very low, increasing the quantity of animals needed while making per head costs very high. Increasing this productivity is thus necessary to allow farmers to have fewer livestock and reduce the pressures and resulting land degradation, while still being able to maintain economically beneficial incomes.

**Income diversification to reduce reliance on livestock breeding.** In the absence of alternative job opportunities or livelihoods, livestock breeding has become a common last resort. Therefore, to decrease pressure on pastures, it is necessary to diversify and support alternative income earning possibilities for local population. For example, the development of ecotourism and independent entrepreneurs can be supported at the local level.

**Create a unified and accessible common platform for knowledge and experience exchanges on pastures.** A hub must be established to advance the level and cohesion of available and developing knowledge on land use and management of pastures that take place in the territory of the Kyrgyz Republic. The current plethora of different donor-funded projects should be brought together in one platform to increase efficiency across efforts to ensure the sustainability of land use and pasture management across the country. This can also act as an access and focal point for donors and other stakeholders.



## Global links

Land degradation was recognised as an imminent threat to the livelihoods and wellbeing of the world's poorest people when the UN developed its Sustainable Development Goals in 2015. Secretary General Ban Ki-Moon stated that “land degradation and desertification undercut human rights, starting with the right to food, adding that nearly 1 billion people lack adequate nutrition and those living off degraded areas are among the most affected. Their situation could worsen if land degradation reduced global food production by 12 per cent as projected.” The UNCCD has invited states “in accordance with their domestic legal and policy frameworks, to include provisions in their laws that facilitates the progressive realization of human rights such as the right to life, food and water in the context of combating desertification, land degradation and drought”. Hence Goal 15 was developed to “*protect, restore and promote sustainable use of*

*terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss*”. A more specific target is 15.3 “by 2030 combat desertification, restore degraded land and soil, including land affected by desertification, drought and floods, and strive to achieve a land degradation-neutral world”.

The work undertaken in this project represent an input into the efforts to comply with Goal 15 and others linked to land (2, 3, 6, 7, 11, 12, and 13) by providing economic evidence on sustainable land management practices and alternative land uses that are needed as one of several inputs and preparatory activities to implement the concept of land degradation neutrality. It also provides tools, methods, and capacity building for economic evaluations to be undertaken in each country for each land cover and land use type, likely future requirements for land degradation neutrality.

## References

1. World Bank. (2015). *Kyrgyz Republic, Snapshot*. Retrieved on [2016, 01/11] from [<http://data.worldbank.org/country/kyrgyz-republic>].
2. National Statistics Committee. (2015). *National Accounts of the Kyrgyz Republic 2010-2014/Национальные Счета Кыргызской Республики 2010-2014. The Kyrgyz Republic: Bishkek, Kyrgyzstan*.
3. National Bank. (2016). “Годовой Отчет Национального Банка Кыргызской Республики За 2015 Год / Annual Report of the National Bank of the Kyrgyz Republic.” Bishkek, Kyrgyzstan.
4. Conservation International. (2012). *Mountains of Central Asia*.” Retrieved on [2016, 01/11] from [[www.conservation.org/where/priority\\_areas/hotspots/europe\\_central\\_asia/Mountains-of-CentralAsia/Pages/default.aspx](http://www.conservation.org/where/priority_areas/hotspots/europe_central_asia/Mountains-of-CentralAsia/Pages/default.aspx)].
5. Liechti, K. (2012). *Values of Pastures in the Debate about Resource Degradation: Evidence from Post-Socialist Countryside Kyrgyzstan*.” *Mountain Research and Development (MRD)*, 32.
6. Land Cadastra of the Kyrgyz Republic. (2015). *Land Use in the Kyrgyz Republic. The Kyrgyz Republic: Bishkek, Kyrgyzstan*.
7. Pasture department. (2015). “Дегградация Пастбищных Земель В Кыргызстане Составляет До 70 %.” Retrieved on [2016, 01/11] from [<http://knews.kg/2015/02/degradatsiya-pastbischnyih-zemel-v-kyrgyzistane-sostavlyayet-do-70/>].
8. Kerven, C., Steimann, B., Ashley, L., Dear, C. & Rahim, I. (2011). *Pastoralism and farming in Central Asia's mountains : A Research Review. MSRC Background Paper No. 1. University of Central Asia: Bishkek, Kyrgyzstan*.
9. Robinson, S., Kerven, C., Behnke, R., Kushenov, K., & Milner-Gulland, E.J. (2016). *The changing role of bio-physical and socio-economic drivers in determining livestock distributions: A historical perspective from Kazakhstan*.” *Agricultural Systems*. 143, 169–82.

**This research has been undertaken by Rahat Sabyrbekov (University of Central Asia) and Almas Abdiev (Kyrgyz Republic, Department of Cadastre (DCR)) with support from the ELD Initiative and CGIAR.**

**For more information about this study and its findings, please contact:**

- ELD Secretariat  
Email: [info@eld-initiative.org](mailto:info@eld-initiative.org)



RESEARCH PROGRAM ON Dryland Systems