High Altitude Rangelands and Pastoralism in Bhutan: Using Sustainable Development Goals to Address Land Degradation and Poverty

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Key words: Bhutan; pastoralism; high altitude rangelands; Sustainable Development Goals (SDGs)

Abstract

Semi-nomadic pastoralists in Bhutan live in high altitude rangelands where they seasonally migrate with yak and cattle herds from 3,000m to 5,000m. Population increase, overgrazing and climate change in eastern Bhutan have led to severe land degradation, winter fodder shortage and reduced milk production per head for herding families. This paper describes how Sustainable Development Goals (SDGs) were used to design a rangeland rehabilitation and livelihoods improvement program with herders in Merak district from 2016 to 2019. The aim was to restore degraded rangelands, improve pastures, develop savings schemes, resolve conflicts and increase conservation knowledge. The approach involved gender sensitive capacity building, on-ground works, action research and social learning. Six SDGs were addressed over three years, SDG 1. No Poverty; SDG 4 Quality Education; SDG 5 Gender Equality; SDG 8 Decent work and economic growth; and SDG 15 Life on the Land. Poverty in Merak district is higher than the rest of Bhutan due to remoteness and lack of livelihood alternatives. Two women's savings groups were formed in 2017 with 148 members, each investing 100-150 Ngultrum per month (US$2-3). In two years, the groups saved (US$3,700) with (US$2,363) borrowed by 10 households for enterprises such as cheese making, wooden bowls, small shops, carpentry, homestays and livestock. The community were trained in organisational and financial management which increased their confidence and skills in working together and resolving conflicts. Eroded rangeland areas were fenced, reforested and checkdams installed. Pasture was sown over 80 hectares at 3,000m and silage produced for winter feed. Collaborative learning between the forest and livestock agencies, environmental NGOs and the community led to declaration of special protection zones, a red panda conservation action plan, junior ranger clubs and a wool processing centre. Challenges included communal areas where families could not agree on whether to improve pasture which required fencing investment. The SDGs provided a useful framework for achieving and monitoring outcomes of integrated rangeland management and livelihood development.

Introduction

The United Nations Sustainable Development Goals (SDGs) were developed in 2012 to build on and replace the Millenium Development Goals. Seventeen interrelated goals were adopted by all UN Member States in 2015 as part of the 2030 Agenda for Sustainable Development to address global environmental, political and economic challenges (Leal Filho et al. 2019). The SDGs cover reducing poverty and hunger; improving health and wellbeing; providing quality education; achieving gender equality; providing clean water and sanitation; affordable and clean energy; decent work and economic growth; improved industry and infrastructure; reducing inequalities; sustainable cities and communities; responsible production and consumption; action on climate change; water and land environments; promoting peace, justice and strong institutions and partnerships (https://www.un.org/sustainabledevelopment/sustainable-development-goals/). SDGs are now guiding many programs and projects in an effort to achieve sustainable development as a human right (Leal Filho et al. 2019).

This paper describes how Sustainable Development Goals (SDGs) were used to design and evaluate a project on high altitude rangeland rehabilitation and improving yak herder livelihoods in eastern Bhutan funded by the UK Darwin Initiative Fund (https://redpandabhutan.wordpress.com/). The UK Darwin Initiative Fund supports projects in developing countries that can protect biodiversity and improve livelihoods (https://www.darwininitiative.org.uk/). The paper discusses how SDGs can provide a useful framework and set of indicators to design multidisciplinary projects aimed at social and ecological outcomes. High altitude rangelands are complex social-ecological systems (Singh et al. 2020). In Bhutan, high altitude rangelands include alpine, sub-alpine, temperate meadows and forests between 2500 and 5500 masl (Dorji 2011). These rangelands provide pasturage to 41,918 yaks and 9904 yak/cattle cross and support livelihoods of approximately 1,039 semi-nomadic yak herder households in 11 of 20 districts (DOL 2019).

Semi-nomadic pastoralists in Bhutan live in high altitude rangelands where they seasonally migrate with yak and cattle herds from 3,000m to 5,000m (Moktan et al 2008). Population increase, overgrazing and climate change in have led to severe rangeland degradation, winter fodder shortage, reduced milk production and habitat loss in some areas (Wangchuk and Wangdi 2018). In eastern Bhutan, where population and livestock density are the highest, rangeland degradation has forced some households to increase livestock numbers and others have ceased livestock raising with few other alternatives (Tenzing et al. 2017). Poverty levels are higher in this remote border area with Arunachal Pradesh due to remoteness (NSSB and WB 2010). An integrated sustainable development approach was needed to address the drivers of high altitude rangeland degradation and find pathways out of poverty. The objectives of the rangeland project were to achieve six interrelated SDGs including; *SDG 1. No Poverty and SDG 8 Decent work and economic growth* (to develop household savings schemes and alternative enterprises); *SDG 4 Quality Education* (to increase conservation knowledge and rangeland stewardship; *and SDG 5 Gender Equality and SDG 17 Partnerships* (to build community capacity to work co-operatively on sustainable rangeland management) and *SDG 15 Life on the Land* (to restore degraded rangelands, biodiversity and improve winter pastures).

Methods and Study Site

The project was located in Merak district of eastern Bhutan (Figure 1). Merak village has 235 households, a population of 1,500, and is located in the Sakteng Wildlife Sanctuary (SWS). The sanctuary has rich biodiversity with 43 rhododendron species (highest in Bhutan), and many globally endangered wildlife species including the Red Panda, Musk Deer, Bengal Tiger and Takin (https://whc.unesco.org/en/tentativelists/5701/). Semi-nomadic herders called 'Brokpas' (meaning people of the high grasslands) originally from Tibet, have lived here for centuries. They established two settlements at 3,000m (Merak and Sakteng) but spend most of the year migrating with their yaks and cattle to winter pastures around 2,800m and summer pastures at 4500m (Wangdi and Norbu 2018). They produce butter and cheese for consumption and sale.
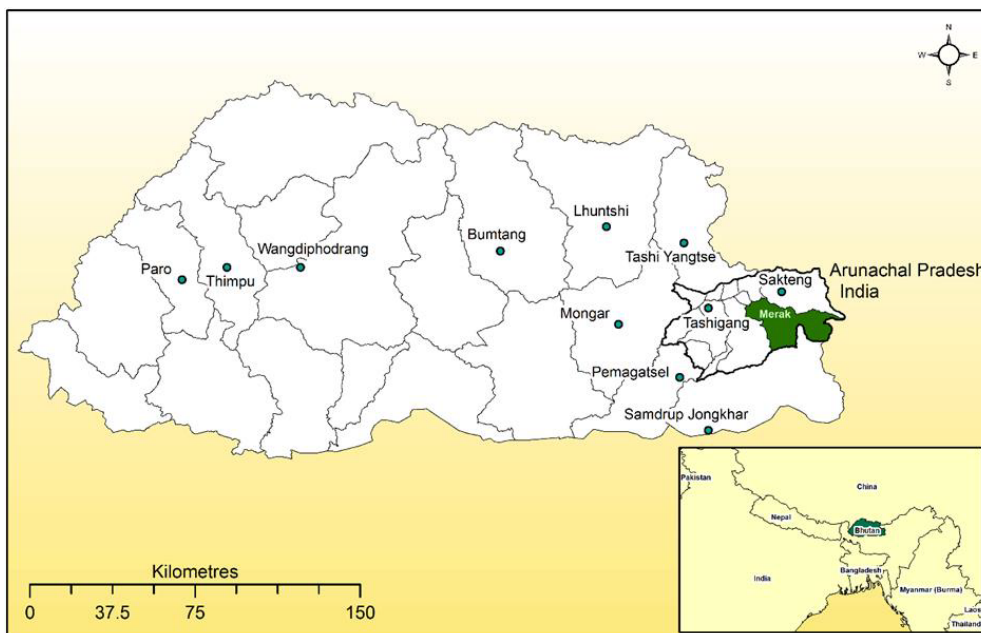
Figure 1   **Study site location**

Implementation methods involved a combination of gender sensitive capacity building, on-ground works, action research and social learning. The first step was to conduct training for 90 households (45% women) with winter grazing leases, in group dynamics, conflict resolution and group management to improve the capacity of people to work together on rangeland management and conservation. Local forest and livestock officers worked with herders to fence and plant 20ha of eroded gully and sow pasture for winter fodder. A study tour to Sikkim (50% women) enabled herders to learn about pasture improvement and community-based conservation. Two savings groups were formed, enabling households to invest in existing or new enterprises. School students and their parents were involved in learning activities (films, plays, games) about red pandas and threats caused by overgrazing, tree lopping and domestic dogs. Red panda camera traps and transects were set up for monitoring presence/absence. Evaluation methods used baseline and final household surveys, in-depth interviews for case studies, field observations and photo points guided by SDG and project indicators.

Results

The overall project aim was to "Restore and protect 150ha of red panda habitat, watershed and winter grazing areas for 120 herding households leading to improved rangeland management, biodiversity, and livelihoods." The project achieved the aim with the following SDGs and outcomes.

SDG 1 No Poverty and SDG 8 Decent work and economic growth: Two household savings groups (Gengu and Merak) were formed following a three day training course involving 98 households in August 2017. Each group formed a committee with office bearers and were given an iron safe, passbooks and ledger books. In 2019 there were 148 members, each investing 100-150 Ngultrum per month (US$2-3) and earning interest. In two years, the groups saved (US$3,700). Households can borrow up to 30,000Nu/year (US$400).Ten households borrowed a total of US$2,363 for enterprises such as cheese making, wooden bowls, small shops, carpentry, homestays and livestock. Most respondents in the final household survey (95%) expressed medium to high satisfaction from being savings group members, with the following quote from a female herder.

"We can save for our children; we don't need to worry about losing it (money)"

SDG 4 Quality Education: The study tour to Sikkim in 2018 showed 12 herders (4 women, 8 men) how communities can benefit from red panda conservation through ecotourism, homestays, recycling, waste management, handcrafts and sustainable agriculture. Since the study tour, Merak village has revised an ecotourism strategy to encourage more visitors to the area. One herding family were inspired to improve their homestay, create a handicraft shop and make rhododendron wine. Two brothers who went on the study tour fenced off their rangeland lease to allow bamboo regeneration for red panda habitat and a nature trail. The final household survey in 2019 showed that 88% of respondents had learnt more about red panda threats and habitat requirements from SWS presentations, the school play or indirectly via word of mouth. A female herder said;

"We learnt that we humans tend to encroach in the territories of the panda (red) which led to decrease in their population. If we protect them by planting their food and making boundaries we can save them."

SDG 5. Gender Equality and SDG 17 Partnerships: The group management training increased community confidence and skills in working together on rangeland and livelihood issues. The 2019 final household survey showed that 86% of respondents thought community cohesiveness had improved and most respondents (77%) rated community capacity as very good or good. As one male respondent said,

"People are listening to each other; they share ideas and come up with good solution to the problem."

Collaborative learning between the forest and livestock agencies, environmental NGOs and the community led to declaration of a special protection zone, a red panda conservation action plan, two junior ranger clubs and a wool processing centre.

SDG 15 Life on the Land: 35 hectares of severely eroded rangeland was fenced, reforested and 136 checkdams installed, resulting in an estimated 30% groundcover increase and 50% reduction in soil erosion from the baseline condition in 2016. Heavy rainfall events destroyed the gully centre so more planting was done above the gully. Perennial pasture was sown over 80 hectares at 3,000m and silage produced for winter feed. Fodder availability for red pandas increased in a fenced area of 40ha with successful bamboo regeneration after removal of livestock. Communal lease areas proved problematic as families could not agree whether to sow pasture which required fencing. However, after seeing fodder results from neighbours who had private leases, some families decided to go ahead with pasture improvement.

Conclusions and Implications

The SDGs provided broad goals or aspirations for the rangeland project and helped to develop objectives and indicators. However, objectives were also based on herders' expressed needs and the problems they wanted to overcome. Herding families, forestry and livestock staff, local government and NGO conservation and development partners all appreciated the integrated nature of the project, and the opportunity to work closely together over three years (Tenzing and Millar, 2019). Whilst using SDGs ensures an integrated approach, the short-term nature of most rangeland projects means that social and environmental outcomes may be limited. The aim should be to set the foundation for long-term social and environmental change by building pastoralists' confidence and skills, linking them with institutional support and developing profitable rangeland enterprises (Wangdi 2016). The rangeland policy and governance context in each country will influence the extent to which SDGs can be successfully employed (Leal Filho et al. 2019; Tenzing et al., 2018). Rangeland research

and development needs to be based on a balance between pastoralists' priorities, institutional capacities, sound science and meeting global agendas or conventions such as the Sustainable Development Goals.

Acknowledgement

References

DOL [Department of Livestock]. 2019. Livestock Census 2019. Thimphu, Bhutan: Department of Livestock, Ministry of Agriculture and Forests.

Dorji, K. 2011. Rangeland tenure transfer: an analysis of policy and legal issues in Bhutan. Policy and Planning Division, Ministry of Agriculture and Forests. Thimphu.

Leal Filho, W., S. K. Tripathi, J. B. S. O. D. Andrade Guerra, R. Giné-Garriga, V. Orlovic Lovren & J. Willats. 2019. Using the sustainable development goals towards a better understanding of sustainability challenges, *International Journal of Sustainable Development & World Ecology*, 26:2, 179-190, DOI: 10.1080/13504509.2018.1505674

Millar, J. and Tenzing, K. (2019) Two steps forward, one step back: Enabling collective action to rehabilitate rangeland commons in Bhutan. Paper presented at the XVII International Association for Study of the Commons Conference Lima, Peru. 2-5 July 2019. Available at https://dlc.dlib.indiana.edu/dlc/handle/10535/10606

Moktan, M.R., L. Norbu, H. Nirola, K. Dukpa, T.B Rai, and R.Dorji. 2008. Ecological and social aspects of transhumant herding in Bhutan. *Mountain Research and Development* 28 (1):41-48.

National Statistics Bureau of Bhutan and World Bank (2010) Small Area Estimation of Poverty in Rural Bhutan. Technical Report jointly prepared by National Statistics Bureau of Bhutan and the World Bank. June 21, 2010

Singh, R., Sharma, R.K., Babu, S. *et al.* 2020. Traditional Ecological Knowledge and Contemporary Changes in the Agro-pastoral System of Upper Spiti Landscape, Indian Trans-Himalayas. *Pastoralism* 10:15 https://doi.org/10.1186/s13570-020-00169-y

Tenzing, K., J. Millar, and R. Black. 2017. Changes in Property Rights and Management of High-Elevation Rangelands in Bhutan: Implications for Sustainable Development of Herder Communities. *Mountain Research and Development* 37 (3):353-366. doi: 10.1659/MRD-JOURNAL-D-17-00016.1.

Tenzing, K., J. Millar, and R. Black. 2018 Exploring governance structures of high-altitude rangeland in Bhutan using Ostrom's Design Principles, *International Journal of the Commons* 12: 428–459 Publisher: Uopen Journals URL:http://www.thecommonsjournal.org DOI: 10.18352/ijc.828

Wangdi, J. (2006) The future of yak farming in Bhutan: policy measures government should adopt, *The Rangeland Journal*, 2016, 38, 367–371. http://dx.doi.org/10.1071/RJ15111

Wangdi S, and Norbu N (2018). Good fences are key to sustainable pasture management and harmonious pastoral society of Merak and Sakteng in Bhutan. *Pastoralism* 8(1): 4.

Wangchuk K. and Wangdi, J. 2018. Signs of climate warming through the eyes of yak herders in northern Bhutan. *Mountain Research and Development*, 38(1):45-52. https://doi.org/10.1659/MRD-JOURNAL-D-17-00094.1