

## Integrating Yak Herding a Resource for Community Livelihood in Protected Area Management: A Case Study of Northern Pakistan

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**Abstract:** This study highlights the implications of yak herding practices on conservation of wildlife species in the Khunjerab national park, northern Pakistan. The yak rearing and farming provides livelihood security to the community and their yak herding practice reflects their enormous knowledge and experience in pasture management. Their traditional herding practice exhibit a modern herding system that would have been recommended for the region and it demonstrates a positive relationship to pastures management, conservation of the wildlife and the future of the park. However, the traditional herding practice is regarded as conflict to the current park management.

**Key words:** Yak herding • Income • Livelihoods • Conservation

### INTRODUCTION

The Khunjerab national park (KNP) lies between 34°44'N-75°17'E alongside of the Pamir covering an area of approximately 2,700 km<sup>2</sup> in the Karakorum mountain range. Khunjerab national park is the third largest National Park in Pakistan. KNP was the first national park in Northern Areas, established on April 29, 1975 by late Zulfiqar Ali Bhutto on the recommendation of Wildlife biologist Dr. George Schaller. The park is home to the last remaining population of Marco Polo sheep and Blue sheep, Snow leopard, Ibex and other fauna and flora. Besides the wildlife, yak population are grazed on various pastures throughout the year using traditional herding practices for centuries by the local community residing in the Park.

The Shimshali yak herding practice represents a 'modern' rotational grazing system, which we believe that the current scientific knowledge would recognize it as a best herding practice in the region. This herding system, which Butz [1] referred as 'interwoven transhumant cycles' reflects generations of decisions that villagers have made about their herding practice. The confidence in their best herding practice without any scientific knowledge comes from their decision making process at

three levels as described by Butz [1], first, at the household level, followed by the community level and the third, at pasture-cycle level. Households need to herd their livestock to ensure their livelihood security and motivation towards maintaining their relationship with hereditary pastoral land, which Butz [1], referred as instrumental and symbolic values. To put this into practice, households have to make a conscious decision to maintain their hereditary pastoral land and accumulation of wealth through their livestock and its products.

However, the creation of Khunjerab national park has restricted the access of the local community to pastures and to their traditional pastoral system. This has led to conflicts between the community and the government and it has altered the important pastoral system that has maintained the park landscape [2]. Ali and Butz [3] points out that "[t]he original park plans would fragment this local management system and upset pastoral migrations which were fully compatible with the aims of conservation defined under the IUCN's guidelines 1979 for conservation in mountain environments". Wegge [4] confirms that the yak herd management system seemed to be a typical 'traditional practice' and there was no

evidence of over-grazing. Thus, it is dangerous to write them off before their potential role has been established. The concern here is that the existing policies have put an end to the pastoral system and would not uphold the park landscape [2].

## MATERIALS AND METHODS

The study was conducted in Shimshal, upper Hunza (Gojal) in Gilgit district of Northern Pakistan. It is approximately 62 km from Pasu, located in Central Karakoram Mountains in northern Pakistan. This site is characterized by dry alpine habitat, comprised of Juniper, shrubby vegetation, community plantations on lower lands and permanent snowfields in higher altitudes. Shimshal is comprised of 179 households with a total population of approximately 1500 individuals in the five adjoining small villages (hamlets). These villages are permanent settlements in the Khunjerab national park, with seasonal settlements of Shimshal community in vast alpine pastures of Pamir, Ghujerab and Lupgar. The community own agriculture land and complement agriculture with extensive herding of sheep, goats, cattle and yaks and thus, well recognized for their enormous knowledge in raising livestock. Livestock play a major role in their livelihood and their herding system represents a symbiotic relationship with high altitude pastures [3]. Shimshal community is well organized and plays an important role in managing their pastures. This is the only community in northern Pakistan that was in isolation without access to road for centuries and very recently in 2003, after twenty years of hard work, the community was able to construct 62 kilometers of road with a minimum support from government and the Aga Khan Foundation.

Field research was conducted in all the five villages in Shimshal. The data were collected using Participatory Rural Appraisal approach and focus group discussions. Two village level (two annual) and four household level (four quarterly) surveys were carried out to obtain household level information. For village and household surveys, a random sampling method with a sample size of = 40% was selected. A total of 70 households were surveyed at the village. Semi-structured interviews were conducted with household heads and focus group discussions with community groups. The participatory resource mapping tool was used to identify pasture cycles and this has helped to analyze the linkages, patterns and inter-relationships between land use and their livelihood systems [5].

## RESULTS

**Local Economy:** Livestock has a major contribution to village economy and the major contribution of the total livestock comes from yak sales (Table1). Shimshal community collected Rs. 35, 28,000 from the livestock which is higher than the income from agriculture, tourism and trophy hunting (Table 2). It has been noted that yak is a major contributor of meat in Central Hunza and other adjoining villages. Considering the contribution of yaks in local economy and the role of herding practice in managing pasture resources, yak herding should be encouraged in the pastures of the park. The community should be involved in the management of the park and should be central to efforts for securing their livelihoods and conservation. Pasture development and maintain a yak population based on the carrying capacity of the pastures should be considered rather opposing the yak herding in the park. Governments should facilitate the community in controlling use of chemicals for the production of potatoes.

*“Even if I have no money, I can still eat well and live happily in my village.....”.*

(Muhammad Gonik at Shimshal)

The overall living conditions of the Shimshal people are moderately high. About 45% households are enjoying with high standard of living and the people who are involved in tourism business and who are working for non-governmental organizations that pays high salary. In Shimshal, the community is engaged in agriculture, livestock rearing, tourism (Pottering and tourist guiding), education and other sectors like construction (carpentry, masonry) and labour. In Shimshal, people are very well organised in collective work, cleaning and repairing of water channels, helping relatives and neighbours at the time of agriculture and construction of houses. In other words, community extend their help for free of cost. This portrays two views, one that give equal opportunity to be involved in community work, help each other and the other hinders people from earning for the work done. A positive aspect of this is that there is strong relationship among the individuals and families that in any circumstance they help each other. There is no tension of money that most people face in different parts of the world more specifically in the western world. Shimshal is the place where if someone has no money, he can still live if has livestock. Generally, Shimshal community depend

Table 1: Livestock Population and Sale, 2007-2008

| Population  |      |        |       | Livestock Sales    |                 |                      |         |
|---|------|--------|-------|--------------------|-----------------|----------------------|---------|
| YAK   | Male | Female | Total | No of animals Sold | Rate per animal | Total Revenue in RS. | Percent |
| Calf (New-born)                                   | 32   | 44     | 76    |                    |                 |                      |         |
| two-three year old                                | 61   | 73     | 134   |                    |                 |                      |         |
| Adult (3-5)                                       | 79   | 86     | 165   |                    |                 |                      |         |
| Adult   | 254  | 318    | 572   |                    |                 |                      |         |
| Total yaks and revenues                           | 416  | 521    | 937   | 194                | 14485           | 2,810,000            | 79.64   |
| <b>COWS</b>                                       |      |        |       |                    |                 |                      |         |
| Calf (new-born)                                   | 38   | 43     | 81    |                    |                 |                      |         |
| One-year old                                      | 40   | 32     | 72    |                    |                 |                      |         |
| Two-year old                                      | 35   | 27     | 62    |                    |                 |                      |         |
| Adult   | 129  | 188    | 317   |                    |                 |                      |         |
| Total Cows  | 242  | 290    | 532   | 12                 | 7000            | 84000                | 2.38    |
| <b>GOAT</b>                                       |      |        |       |                    |                 |                      |         |
| New born  | 388  | 356    | 744   |                    |                 |                      |         |
| One-year old                                      | 355  | 349    | 704   |                    |                 |                      |         |
| Two-year old                                      | 243  | 227    | 470   |                    |                 |                      |         |
| Adult   | 1319 | 1545   | 2864  |                    |                 |                      |         |
| Total Goats                                       | 2305 | 2477   | 4782  | 115                | 4000            | 460000               | 13.03   |
| <b>SHEEP</b>                                      |      |        |       |                    |                 |                      |         |
| Lamb (new-born) *                                 | 229  | 237    | 466   |                    |                 |                      |         |
| One-year old                                      | 154  | 151    | 305   |                    |                 |                      |         |
| Two-year old                                      | 109  | 115    | 224   |                    |                 |                      |         |
| Adult   | 650  | 732    | 1382  |                    |                 |                      |         |
| Total sheep                                       | 1142 | 1235   | 2377  | 87                 | 2000            | 174000               | 4.93    |
| <b>DONKEY</b>                                     |      |        |       |                    |                 |                      |         |
| Foal (new-born)                                   | 0    | 0      | 0     |                    |                 |                      |         |
| One-year old                                      | 0    | 2      | 2     |                    |                 |                      |         |
| Two-year old                                      | 0    | 0      | 0     |                    |                 |                      |         |
| Adult   | 6    | 18     | 24    |                    |                 |                      |         |
| Total Donkey                                      | 6    | 20     | 26    |                    |                 |                      |         |
| Total livestock and revenues from livestock sales |      |        | 8654  | 408                |                 | 35,28,000            |         |

Source: Field survey

Table 2: Revenues collected in Shimshal

| Sector          | Amount     | Percentage |
|-----------------|------------|------------|
| Agriculture     | 8, 85, 920 | 15.03      |
| Tourism         | 6, 27, 500 | 10.66      |
| Trophy hunting  | 8, 50, 000 | 14.43      |
| Livestock sales | 35,28,000  | 59.88      |
| Total revenue   | 58,91,420  | 100        |

more on their livestock, for milk, butter, meat and other dairy products i.e. Qurut, Mirik and Cheese that community use in their daily diet. All the households in Shimshal own the livestock that include yaks which basically serves as an asset that is used to cope with economic crises. Households sell their yaks and other livestock that brings an income to cover the expense for a whole year. October is a peak month for their yak sales, as they gather

all the livestock from the pastures in September by celebrating and event "Kutch". Thanking God for their safe return from the pastures with the wealth of livestock and its products.

In addition, there is a substantial income that comes from tourism. Shimshal people are well known for their pottering and guiding that provide highly paid jobs during summer. A couple of months of work provide them enough money to support their families.

Table 3: Key Mechanisms of Pasture Resources Management in Shimshal

| Mechanism  | Purpose   |
|--|---|
| Village level decisions: all village heads and household heads have a role in decision making process. Village elder (lumberdar) makes the decision. | Involve all village heads and household heads in decision making. To provide equal opportunity to every household and to bound every individual to abide by collective decision and the regulations made by the community.  |
| Household level decisions: all members of the household have a role in household level decision.   | Involve all household members in decision making process and provide equal opportunity to every household member. To ensure their commitment, availability, contribution in labour work.  |
| Pasture-cycle level decisions  | Informed decision based on climate conditions, accessibility, availability of fodder and for safety of livestock.   |
| Pastures management: A series of pasturing on specific pastures, pasturing cycles, time of pasturing, determining duration and livestock numbers.    | To attain maximum benefit from the resource; to maintain pastures' quality and to ensure the continuous supply of fodder for the livestock in different seasons and facilitate new growth of vegetation. And to retain their tradition and heritage, a symbol of their pride. |

Source: Focused group discussion with community elder group.

Shimshal being at a higher elevation, it comes under single crop zone, where the community harvest only one crop from their agriculture. Agriculture used to be very limited as well as there was no option of marketing because of the poor market access, but in the last few years after the completion of their access road in 2003, the community has started exporting agriculture goods. Wheat has been remained the staple crop for a long time and the community was self-sufficient in wheat production [3], but more recently potato has taken its position. The new varieties of potatoes were introduced and the community is benefiting from the high potato production. However, with the rise in potato production, use of pesticides and chemical fertilizers has increased where in the past the community has never used chemical fertilizers. In addition, wheat production has dropped drastically as well. This may have negative consequence on food security in the village. The community used to have the wheat stock for at least two years, but with the increase in potato production fewer people stock wheat for a year.

**Revenues from the Yaks:** The major livestock revenue comes from yak sales. The data showed that 79.6% of revenue collected from livestock sale comes from the yaks, 13% comes from goats, 4.9% comes from sheep and 2.3% comes from cow's sale (Table 1). Shimshal community collected Rs. 35, 28,000 in one year from the sales of the livestock. However, the total value of animal products is accounted for approximately Rs. 1, 28,000 that include butter, qurut and yak hair, these are normally available in the village.

**Livestock Rearing on Conservation:** The pastures in Shimshal territory are more diverse because of the

topography and varied in altitudes. These pastures are spread over 2700 square kilometer, where the Shimshal community graze their livestock. Shimshal pastoral system demonstrates a unique mechanism of proper utilization of pasture resource. The purpose is to maintain the pastures' quality for the herds that will be grazed periodically in the area (Table 3 the mechanism of herding practices). The community has been practicing this grazing system that has been adopted based on climatic conditions, availability of grass and to maintain the pasture for future grazing. The grazing system represent a modern system that accommodates all the aspects; maintaining pasture quality, seasons, considering the regeneration, duration and the number of livestock needed to be grazed in a particular pasture and the periodic movement of animals necessary for maintaining the pastures. Though the practice is not based on the "hard science information" but the experience and knowledge the community possess can be observed in their pasturing system, which the current scientific knowledge would recognize it as a best herding practice in the region [1]. This grazing system is quite different than those nomadic pastoral groups which come to other alpine pastures for short term, where they graze large number of livestock. The primary goal for those groups is to take maximum benefit from pastures where they may not return the next year. The research showed that there is no evidence of pasture degradation in Shimshal territory [4]. There was evidence of decline in wildlife population but this not because of the grazing but due to a disease, scabies (sarcoptic mange) in Blue sheep and from poaching and illegal hunting of Marco polo sheep [6]. However, there are no signs of competition found over forage between wildlife and the livestock population.

**Shimshal Herding System:** Shimshal herding predominantly follows a traditional pattern dictated by climate and season, topography of the land and by social and cultural influences. Their traditional herding system relies on centuries of experience, knowledge of pastures' productivity, availability of water during summer and winter, accessibility and vulnerability to predators. In addition, socio-cultural influences which are embedded in their self-identity as "Shimshali," a community that is highly devoted to maintain their culture and hereditary resource.

The decision making process for herding system takes place at three levels: household level, community level and pasture-cycle level [1]. The initial decision process starts at the household level, where the household members get together to plan how many livestock need to be sent to pasture and the decisions are based on several factors: availability of number of persons (labour), affordability of cost in terms of cash or kind (material) and number of milking animals available. At the community level various factors are involved in decision making process, these include, but not limited to appropriateness of pasture for the specific number of livestock, mapping of pastoral movements based on their years of experience, cultural festivals and other ceremonies. The community level decision ensures that all the households get an equal opportunity in the shared resource. It is important to note that the community motivation for conserving their resources is the main priority and it is reflected in their resource use activities.

At the herdsmen level (pasture level), herdsmen have to make conscious decisions based on their experience of weather conditions, pasture condition, access during winter and water availability. The herdsmen have to make sure that livestock herd is safe from predators, enough fodder to feed on; water requirement is fulfilled and especially, timely departure to other pastures as well as to the village in time for celebration of the special ceremony called "Kutch," an event for offering gratitude to God for His blessings for their safe return with animals.

In achieving these, community practice two kinds of herding system, summer and winter pasturing. In both summer and winter pasturing, there is one thing common, caring of their ancestral resource which they affiliate with the founder of Shimshal. According to one of popular histories Mamu Singh a Burusho (brushski speaking) from Baltit (Central Hunza) found the Shimshal region four centuries ago. And later his son Sher discovered all other territories including Pamir which the lineage of Shimshal:

Gazikator, Bakhtikator and Baqikator claim as their ancestral land [7]. A description of pastoral cycles practiced in the pastures is provided below.

**Summer Pasturing System:** Summer pasturing represents a combination of ecological knowledge, both climate and vegetation. Knowledge of pasture, vegetation, caring capacity, plays a key role in pasturing. A group of herders include women get there turn to stay in pasture for the summer period. After village level decision on who would be going with the livestock, the herders have to leave the village by 1st week of May to Shujerab, the nearest pasture. This arrangement is made based on two reasons; first the availability of new vegetation in pastures for livestock and second community has to cultivate agriculture crops and the agriculture fields need to be closed for grazing.

The move to the next pasture is determined by climate condition and availability of new vegetation in the pasture. There is also time limit (period) set for each pasture with the time cushion of three to four days. The pasture cycle continues, making several stays at Sher Lakhsh, Furzin-i-Dasht, Gorjerav, Sher Bulak, Gharsar and Sher-a-lik until they reach to their final destination, Pamir, where they spend two and half months. Most of the production of butter and other animal products takes place in Pamir. In summer pasturing, women play a major role in livestock herding and their contribution is well recognized. Women groups are actively involve in the process from milking animals to making end products; butter and qurut.

Finally the return, by September 10<sup>th</sup>, they have to leave Pamir and delays or early return would put the livestock at risk. The delays in return would end up in facing cold temperature or snow on high altitude and early return would put the livestock at risk because they have to cross several water routes and with peak water flow as it is difficult to cross. Their arrival to the village after spending over six months in pastures is celebrated with an event called "Kutch". This is a special occasion to thank God for their safe return with the accumulated wealth; butter, qurut (milk product), cheese and many other products. The celebration continues for a week inviting friends and families to their homes.

**Winter Pasturing System:** Winter Pasturing is done predominantly with yaks. Normally, herders stay with their livestock to protect it from attack by wolves or snow

leopards, especially at the time of calving and to prevent the herd from stray. Given the fact that Shimshal community has limited land available in the village to feed their livestock, especially yaks and thus, their dependency on pasture resource is obvious. However, yak herding in Shimshal has another purpose that is proper utilization of pastures. Although, it is very tough to graze their yaks in winter, the community has been practicing winter pasturing for centuries to maintain the pasture resource. It is their perception and they have witnessed that after grazing their livestock in the summer, certain pastures remain untouched and if those parts have not been grazed, then those pastures become low productive for the next year.

Yak herds are moved periodically based on the climatic conditions, availability of food and water. There were several cases where the yak herds got killed because of heavy snow and the movement of yaks from one pasture to another pasture is not easy.

## CONCLUSIONS

Findings indicate that yaks are the main source of livelihood for the community. The community's affiliation with yak herding embedded in their self-identity as "Shimshali," a community that is highly devoted to maintain their culture and hereditary resource, the pastures which their ancestors passed on to them. We found that Shimshal herding practice on high alpine pastures is a response to shortage of forage in the village, to have agriculture while livestock in the pastures, adaptation to temperature as well as proper use of the resources available to them. The pattern of the herding symbolizes a traditional one but it has all the elements of a scientific grazing system that may be recommended for the area based on the scientific knowledge. This pattern of grazing is quite unique than those pastoral systems in other areas of northern Pakistan, where nomadic communities come to spend summer and their primary goal is to take maximum benefit from the pasture where they may not return the next year. This herding practice can be viewed as livelihood source for the local communities as well as protecting the pasture resources for future purposed.

Other products such as milk, butter qurut, yogurt and meat used at the household level have a significant contribution in household diet and have a significant cash value in nearest markets in Hunza and Gilgit. Despite the

conditions of access (still not accessible for large vehicles) livestock have been sold to other parts of Hunza valley, where livestock rearing has reduced because of the diversified economies. Shimshal fulfills the region's meat requirements.

The knowledge of herding is based on the experience that community has over the centuries and they develop the rules and regulations to benefit both their survival in these harsh climatic regions and also to maintain their inherited pasture resource. The consideration on integrating the yak herding would help both livelihood of the local communities and conservation of the resources as well. Keeping their rights in park management would build sense of ownership and caring for their resource and most of the park management specialist would support it for successful conservation.

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