

A Community-based Approach to Mitigating Livestock-Wildlife Conflict in Ladakh, India

by

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Introduction:

Livestock depredation by snow leopard and wolf is widespread across the Himalayan region (Jackson et al. 1996, Jackson and Wangchuk 2001; Mishra 1997, Oli et al 1994). For example, in India's Kibber Wildlife Sanctuary, Mishra (1997) reported losses amounting to 18% of the livestock holdings and valued at about US \$138 per household. The villagers claimed predation rates increased after establishment of the sanctuary, but surveys indicated a dramatic increase in livestock numbers accompanying changes in animal husbandry systems (Mishra 2000).

Similar conditions occur in the Hemis National Park in Ladakh, India, which covers 3,350 square kilometers in the TransHimalayan Range of Ladakh (Fox and Nurbu 1990). The park offers prime snow leopard habitat, and harbors four species of wild sheep and goats, giving it international biodiversity importance. About 1,600 people live in 16 small settlements scattered across three valleys. They grow barley and a few vegetables, and own more than 4,000 head of livestock, of which 81% are sheep and goats, and 11% are yaks, cattle and crossbreeds. Tourism provides an important source of supplementary income. Ladakh was opened to tourism in 1974, and the Markha Valley circuit through Hemis National Park remains the most popular trekking route, with about 5,000 visitors per year.

The key management issues involve increasing levels of complaint over livestock depredation due to snow leopard and wolf. A survey of 79 households in 1999 indicated that park residents owned 3,977 livestock comprised of six different kinds, with an average household holding of 50.3 animals consisting mostly of sheep and goat

(Bhatnagar et al. 1999). Only 29% of the households owned any yak or crossbreeds, while 29% and 25% did not own a donkey or horse, the primary pack animals in the area.

Local villagers reported losing 492 animals to predators over a 14 month period from late 1997 to early 1999, equaling about 12% of the total livestock herd and valued at an estimated \$23,500 (US). The mean annual household loss was estimated at 6.2 animals, an average value of \$297 per family. This is clearly a significant economic impact to these pastoralists.

Snow leopard and wolf were associated with 55% and 31% of presumed depredation incidents respectively, with sheep and goats constituting 75% of all stock lost, followed by yak-cattle (13%) and horses (8%) (Bhatnagar et al. 1999). Three settlements (Markha 37.4%; Rumbak 9.1%; Chokdo 7.5%) incurred 54% of all known or presumed depredation according to the interview survey. Depredation rates varied geographically with distinctly recognizable “hotspots,” as illustrated in Figure 1.

Snow leopards have no trouble jumping over the low stone wall which most livestock pens have. Thus the most significant and adverse impact occurs when a snow leopard enters a poorly constructed corral and then wounds or kills all of the crowded sheep and goats, which cannot escape the enclosure. While incidents of multiple or “mass killing” totaled only 14% of all the depredation incidents tallied (N = 210), they accounted for nearly 50% of all livestock lost to predators. Understandably such events arouse considerable anger among livestock owners, who may retaliate by poisoning and killing the suspected culprit.

With rising complaints from the local populace, the Ladakh office of the Jammu and Kashmir Wildlife Department initiated a compensation program in 1996 meant to benefit the local population. But due to lack of funds and cumbersome registration claim procedures it back-fired. Often it required a herder to trek for several days to Leh where the office is based, and after having to run from “pillar to post” and waiting for two to three years, the compensation received was not sufficient to make up for all that effort invested. These factors have led to deteriorating relations between the park authorities and the local people, accompanied by increased evidence of retribution towards snow leopard.

This is the point at which the Snow Leopard Conservancy, an INGO, became involved with the aim of addressing root causes for depredation loss. SLC’s primary objectives are to:

- Reduce livestock losses to depredation by snow leopard
- Enhance rangeland habitat and prey populations through community-based stewardship and sustainable resource management
- Increase local incomes and reduce dependency on animal husbandry

Remedial Actions and Planning Process used to Address Livestock Depredation in Hemis National Park

Recognizing the importance of a bottom-up rather than the top-down approach, we are employing Appreciative Participatory Planning and Action (*APPA*) as the driving process for involving villagers in planning and design of remedial appropriate measures. *APPA* combines the advantage of building upon the community's strengths (i.e., improving on what works to make it better), with low-cost, locally appropriate solutions at minimal cost. When applied with basic tools from PRA (Participatory Rural Appraisal), planners and stakeholders benefit from the wealth of traditional knowledge relating to animal husbandry and predator occurrence or behavior.

APPA is used throughout the project to facilitate interaction between the various players and stakeholders. It combines concepts from *Appreciative Inquiry* (as applied in business leadership training) and *Participatory Learning and Action (PLA)*, Pretty et al. 1995), in a collective inquiry and planning mechanism aimed at fostering consensus and achieving cohesive actions among a range of participants. *APPA* operates under two complimentary premises: (1) What you seek is what you find - "if you look for problems, then you will find more problems" and conversely, "if you look for successes, then you will find more successes," and (2) What you believe in is really what matters most - "if you have faith in your vision or ideas for the future, and if these are do-able or believable, you can achieve success without waiting for the government or an outside agent to take you there."

APPA is practiced through a sequential, reiterative process that seeks to (1) *discover* the community's strengths and its valued resources; (2) *envision* their short- and long-term futures if the necessary resources were suitably mobilized and the community acted in concert; (3) *design* a basic action plan for guiding both development and nature protection in ways that substantially limit long-term dependency upon outside financial sources or technical "know-how" and (4) *motivate* participants to initiate community-improvement actions *immediately*, and largely on their own, rather than delaying the process for "some time in the future."

Effective remedial actions hinge upon a sound understanding of the root causes for depredation, which requires a deep appreciation of how people manage their domestic herds and their rationale for decision-making. PRA tools enable planners and villagers alike to obtain a wide range of information on existing conditions during the Discovery Phase (Table 1).

Table 1: Examples of PRA Tools Used for Appraising Livestock Depredation and Animal Husbandry Patterns

- Natural resources and village assets map
- Map of depredation "hotspots" and seasonal pastures
- Calendar of seasonal livestock movements and daily herding cycle
- Seasonal calendar of depredation losses (shows peak depredation periods)
- Pasture ranking with respect to depredation and other losses
- Pair-wise matrix ranking of major sources of livestock mortality
- Ranking of different guarding measures

- Income and livelihood ranking matrix
 - Semi-structured interviews to assess predation causes and patterns, along with possible remedial actions
 - Venn diagram showing village institutions affecting livestock production & management
 - Village or pasture walk to obtain first-hand understanding of livestock management practices and issues
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The participatory “discovery” phase exercises conducted in the five settlements of Markha, Rumbak, Skyu-Kaya and Hankar have all implicated poorly constructed livestock pens and lax daytime guarding practices as the primary cause of depredation. Stock are allowed to forage, often completely unguarded, in areas with well-broken terrain and cliffs, and thus offering prime habitat to snow leopard (Jackson et al 1996). The fact that domestic livestock now substantially outnumber natural prey and biomass only invites loss to wild predators. Historically there has been better emphasis on daytime guarding, and problem predators were controlled through trapping and other traditional control methods (which are no longer permitted by the government). With more children going to school and youths increasingly reticent to assume the difficult livelihood of livestock herding, even highly vulnerable small-bodied livestock are left to graze unattended during the daytime. While baseline documentation is lacking, predator numbers appear to have increased due to park regulations and patrolling by park guards. The mapping and ranking of pastures clearly suggest that depredation rates vary with locality, presumably reflecting differences in predator densities, habitat suitability and herding patterns.

The next step entailed envisioning how each village might look within a time frame of 1-2 years (short-term) and 5-10 years (long-term) if the community acted to reduce predation losses, protect snow leopards and other wildlife, and successfully enhanced their income-generation skills. Images from these individual and collective “dreams” provided a firm basis upon which to collaboratively design remedial measures for reducing depredation loss, improving household income and promoting wildlife conservation and stewardship. Participants tended to visualize a situation in which people and wildlife lived in harmony, and in which the people’s prosperity supported this balance.

Remedial measures ranked highest by villagers were predator-proofing of night-time corrals to prevent multiple losses of livestock, followed by protection of the natural prey base and herder education to improve day-time guarding and animal husbandry practices. Since predation on the open range cannot be eliminated, we also concentrated on providing skills training to enhance the villager’s capacity for income generation and capture of more tourism revenue as one means for offsetting the economic impact of depredation. SLC provides environmental education using culturally-appropriate posters and other materials was ranked the lowest.

Participants readily concurred that virtually all existing corrals were poorly constructed with low and flimsy walls which offer little or no deterrent to a predator intent on an easy

meal. Participatory planning enabled stakeholders to design and construct predator-proof night-time enclosures with strong, high (2.5 – 3 m) walls and mesh wire covering the roof to preclude any access from above, along with well-made wooden doors. Corrals constructed in a top-down manner were less well designed, for example, being placed adjacent to cliffs along which a snow leopard may gain easy access to the tightly packed livestock within the 3 m high walls!

Villagers were asked to follow “Best Practices” guidelines in designing the remedial actions so that they would be (1) environmentally responsible; (2) economically sustainable within the local context; (3) socially responsible (e.g. build upon proven traditions and cultural values that protect nature rather than damaging it); and (4) implemented under a mutually agreed-to and signed “Action or Work Plan” which sets forth the responsibilities, contributions and obligations of each partner as described below (Jackson and Wangchuk 2001). Clearly, any action must be compliant with the park’s rules and regulations, as well as sensitive to local wildlife species and habitat management needs. The action should not result in fewer snow leopards or blue sheep, and could not allow hunting, trapping or poisoning of animals. Best practices also provide an avenue for blending external expertise and scientific knowledge with local traditional knowledge. This better ensures remedial measures will meet the park’s regulations while offering room for locally flexible designs based upon the crop and livestock damage control lessons learned in other areas.

It is important to agree on what can and cannot be realistically achieved in terms of reducing loss, and to understand the impossibility of eliminating all livestock depredation from a particular area. For example, there is no easy solution to depredation on the open range. Large-bodied stock like yak, yak-cattle crossbreeds, and horses need to roam widely when foraging, and consequently are rarely tended by shepherds, yet they may also fall victim to snow leopards or wolves, especially in winter when they are weaker.

Using a poster depicting good and poor animal husbandry practices, and which illustrates examples of some economic and social benefits associated with protecting wildlife, we have explored ways in which wildlife can be of benefit to the local people. In this regard, we look at how communities might improve upon what they were already doing, rather than trying to establish an unfamiliar activity or economic system. In Ladakh, where adventure trekking is well established, local people needed help in capturing more tourist dollars and other indirect benefits, without increasing their dependency on tourism in these uncertain times. To-date we have concentrated on skills training for operators of “parachute cafés” (recycled Army-surplus parachutes used as tented, temporary facilities). Training was aimed at improving their menus, hygiene and campgrounds. The parachute cafes will also serve as focal points for providing tourists and local communities with information on wildlife viewing and conservation opportunities. Our next step, in collaboration with TMI, will be to build upon the villagers’ desire to develop traditional homestays.

The Action Plan specifies such details such as, “where (location); who (the responsible party or parties); what (details of required inputs and activities); how much (quantity);

when (scheduling); how implemented (the method or methods to be used) and how the effectiveness of the action will be monitored (“success” indicators and process to be used by both SLC and the community). Participants produced drawings illustrating the improved livestock enclosure, and related design documentation on enclosure dimensions and required materials (Figure 2). A typical improved livestock pen for sheep and goats is 18 x 35 feet with an eight-foot high stone wall, and an open roof covered by 4 by 4 inch wire mesh and supported with wooden poles every few feet. The structure has no windows, and a single wooden closely-fitting door that can be securely locked at night (Figure 3). Materials cost USD \$ 400-600, depending on transportation costs of those items purchased in Leh (wire-mesh, poles, door, door frame, hinges and cable fasteners). Two such structures were sufficient for protecting all sheep and goats from the 21 households of Skyu-Kaya using the Lilangste pasture.

The Action Plan includes the names of households and user groups who will assume responsibility for constructing and maintaining the improved pen. Any new or re-constructed corrals must benefit all livestock-owning households, who agree not to file any compensation claims with the Wildlife Department, and to immediately report any instances of poaching to the authorities. All remedial actions must produce conservation benefits, and a reciprocal contribution in the form of labor and collection of locally available materials is expected from the participating community. Livestock owners must assume responsibility for maintaining the structure in good repair, and for monitoring the effectiveness of the intervention using established criteria and indicators for success.

We ensure that the improved facility is no larger than the existing structure or structures they are intended to replace, in order to avoid encouraging an increase in livestock numbers. Most pastures are already under substantial grazing pressure, in effect forcing blue sheep onto the steeper and less productive pasturages. An important long-term goal is to improve forage conditions for native prey species, in order to help reduce depredation pressures on domestic stock. Clearly this will require concerted actions such as rest-and-rotation grazing schemes, establishing special pastures reserved for wildlife, and other measures for enhancing forage plant seedling establishment and productivity.

The agreement is developed for signature by the primary implementing agency and beneficiary community, represented by the leader of each corral user group or a member from each household in the case of a small settlement. The agreement specifies key conditions, such as the materials, labor and technical expertise each partner will provide, special provisions for protecting snow leopards and their prey species, and specific indicators the community will employ for measuring the success of the proposed initiative. Local people identified the following expected outputs or indicators for assessing project success:

- Numbers of livestock lost would decline very significantly and no multiple depredation incidents would occur if corrals are properly constructed, utilized and maintained (village stewards are being trained to log livestock mortality);
- By eliminating multiple predation incidents, the community’s attitudes toward snow leopards, general tolerance of wildlife, and the presence and regulations of

- Hemis National Park would improve markedly (SLC is assessing these attitudes through focused interviews and a comprehensive questionnaire);
- Herders would spend less time guarding at night, leaving time for other more productive activities; and
 - Villagers would earn more income, especially if corral improvements were accompanied by efforts to enhance livelihood skills from tourism (to be monitored annually by SLC staff). Over time these changes would lead to more stable wildlife populations within Hemis National Park, along with a better working relationship between the park authorities and the local residents.

Conclusions:

The highly participatory process employed under *APPA* indicated that the most cost-effective option for reducing depredation, especially multiple losses to snow leopard or wolf, lay in predator-proofing existing structures. Furthermore, *APPA* is a powerful tool for empowering herders and farmers. It builds pride by highlighting positive community attributes and building upon traditional values and successes. This approach is highly effective in mobilizing rural communities toward greater self-reliance, and thus a more harmonious long-term relationship with the National Park in which they live, and on whose resources they depend so heavily. The degree of success appears to be proportionate to the community's perceived 'ownership' of the project and the materials or resources it contributes. The greater their involvement, commitment and contribution, the more likely the structure will be well looked after.

We illustrate these conclusions with two examples from our work in Ladakh. Construction of the first corral in Markha was delayed due to a late winter. Eventually, the structures had to be increased in size from the original plans, because the villagers had deliberately underestimated their livestock holdings fearing they may be taxed more by the government for reporting actual herd sizes. They used the corral before it was fully predator-proofed, and lost 29 animals to a snow leopard. As donors, we felt some responsibility for the loss and called a community meeting. The household most affected had recently suffered a death, and the village as a whole assumed full responsibility for what had happened, attributing the incident to a traditional "Mountain Spirit." No compensation was requested.

The residents of Skyu-Kaya scheduled the corral improvement for the summer. But when the time came, they found they were short of manpower, because many households were out with their pack animals accompanying trekking groups. The problem was solved when each household contributed toward the substantial cost of hiring outside laborers to work under the supervision of a good stonemason (known locally as a *mistri*). Recently a villager told an SLC staff member that, "In the late evening, after our sheep and goats had spent the day grazing, we herded them into the new pen, locked the door and walked the two miles to our home. When we returned in the morning, there were tracks of a snow leopard all around the pen. It had even jumped up onto the wall. This happened two nights in a row, but we lost none of our animals! As Buddhists, we are very happy, for the sake of our livestock, and for the snow leopard that might now go back to hunting

blue sheep. Also we are very happy because now we shepherds no longer have to lie awake on the cold ground next to the pen. We can go home and get a good night's sleep.”

It is apparent that corral predator-proofing can go a long way in reducing losses and alleviating conflict due to livestock depredation by snow leopard. As the experience in Ladakh shows, enhancing existing structures can be accomplished inexpensively and with considerable input from local communities. It is now widely acknowledged that the future of most protected areas hinges on the degree to which local people's concerns, needs and aspirations are addressed by conservationists. For example, a promising approach rests in promoting a set of carefully designed and monitored community-based stewardship initiatives in which local people benefit by offering visitors good wildlife viewing opportunities, local nature guides, traditional homestays, attractive camping sites, or handicrafts for sale. Wherever possible, we believe that corral predator-proofing should be implicitly linked with specific conservation measures and initiatives aimed at enhancing local incomes. Toward the long-term goal of community-based conservation and resource management, we have started to recruit local villagers to serve as “Wildlife Stewards”. For more details visit the Snow Leopard Conservancy's website at: www.snowleopardconservancy.org

Thank-you!

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See attached Powerpoint file for figures (Figures for Wangchuk-Jackson.ppt)