



A Need for Context-Based Conservation: Incorporating Local Knowledge to Mitigate Livestock Predation by Large Carnivores

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Mitigating livestock predation by carnivores is crucial to ensure carnivore conservation and facilitate human-carnivore coexistence. Mitigation measures proposed by conservation agencies, however, are often technocratic and perceived as being an external imposition on the local community. Herders affected by the depredation may have the knowledge to design locally relevant solutions, but they might lack financial and technical support to implement these effectively. Their inability to act can result in the communities being viewed as antagonistic rather than a part of the solution. We present a case study on co-development of a conservation intervention by a traditional pastoral community together with a conservation NGO, to mitigate livestock depredation inside night-time corrals in Ladakh, India. Between January and June 2020, livestock corrals in Sumdoo TR village were attacked 10 times by carnivores such as snow leopards and wolves, killing over 100 sheep, goat, yak, and horses and causing losses of over 10,400 USD. Local people were agitated, and there were strong demands for capture or removal of the carnivores from the area. We operationalized the PARTNERS (Presence, Aptness, Respect, Transparency, Negotiation, Empathy, Responsiveness, and Strategic Support) principles framework for community-based conservation to help the village effectively implement an intervention based on a novel predator-proof corral design conceptualized by the community. We demonstrate that empowering the community to design and implement a conservation intervention helped them take ownership of the effort, improve trust with conservation agencies, and hence likely to be a long-term solution to conservation conflicts in the region. Our approach of using the PARTNERS principles has relevance for conservation agencies who are trying to implement interventions, particularly those geared toward reducing livestock depredation by carnivores. Our approach further helps communities to view themselves as part of the solution and not the problem.

Keywords: community-based conservation, coexistence, co-development, interventions, herders, mitigation, carnivores

INTRODUCTION

Livestock depredation by carnivores is a conservation concern globally. It can cause severe economic and emotional trauma for livestock owners, and retaliatory killing of carnivores (Woodroffe et al., 2005; Barua et al., 2013). Mitigating livestock losses is crucial for conserving large carnivores and facilitating coexistence with people (Treves and Karanth, 2003). The costs of coexistence, however, are often borne locally by the communities co-inhabiting areas with wildlife. Exclusionary conservation approaches like protected area-based approaches have often come with significant social cost and conflict. This has caused a further alienation of local communities turning potential conservation allies into adversaries (Lele et al., 2010). Although numerous measures have been developed to prevent livestock predation, the decision on which measure to adopt is often taken by the government or conservation agencies with little or no consultation with the affected community. Inputs on technical feasibility and local relevance of such measures are seldom sought from local stakeholders, and their efficacy is rarely measured. Livestock herders may be able to design locally relevant solutions, but often lack financial and technical support to implement them effectively. This relegates affected pastoral communities to appear as part of the problem and not the solution.

Several non-lethal techniques are used by herders and government agencies to minimize livestock depredation by carnivores in livestock grazing pastures (Breitenmoser et al., 2005). These include use of guard dogs and avoidance of grazing in conflict hotspots (Breitenmoser et al., 2005). Visual repellents (e.g., fladry, fox lights, strobe lights) and acoustic repellents (sirens) are also deployed (e.g., Shivik et al., 2003). However, the issue of livestock predation inside night-time pens is more serious because attacks in these pens often lead to surplus killing of livestock i.e., when carnivores kill several tens of livestock even when they cannot eat them all (Kruuk, 1972). Such instances have a much bigger negative impact on herders than predation of a few livestock in the pastures. Interventions to protect livestock inside night-time corrals include fencing, ranging from building basic stone wall fences to those reinforced with electric fencing or netted fences (e.g., Samelius et al., 2020). While fencing is an effective intervention, there are challenges and limitations including the high cost, labor, and technical knowledge that is necessary for installation and maintenance (Kioko et al., 2008). Maintenance of such installations proves challenging without sustained technical support or training imparted to those using the fences. Additionally, the effectiveness of such interventions is rarely tested (Samelius et al., 2020). Collectively, local acceptance of fencing as a means to reduce depredation by carnivores can prove challenging if the affected herders cannot effectively manage the setup post installation. This can quickly lead to a perception that the intervention is ineffective.

The practical challenges of achieving effective community engagement are considerable (Waylen et al., 2010) and are fraught with difficulties and ethical considerations (Chan et al., 2007). Often the opportunities and challenges of implementing effective community engagement are seldom discussed. There is a need for more case studies where conservation interventions

are co-developed by affected communities as equal partners with conservation agencies (e.g., Govt., NGOs). This is particularly important and relevant in areas of the world where challenges of poverty, weak institutions, and poor governance exist simultaneously, further limiting the opportunity of local communities to participate in biodiversity conservation.

We aim to highlight the approach to implementing a conservation intervention to mitigate livestock depredation inside night-time corrals of a traditional pastoral community in a remote area of Ladakh, India. Here, we present a case study on how a predator-proof corral was co-developed and co-designed with local communities. We present the case study in light of the PARTNERS (Presence, Aptness, Respect, Transparency, Negotiation, Empathy, Responsiveness, and Strategic Support) principles for community-based conservation developed by Mishra (2016) through 20 years of experience across the snow leopard *Panthera uncia* habitats of Central and South Asia. The eight PARTNERS principles for community-based conservation build on the ideas that have been developed in diverse fields such as applied ecology, natural resource management, health, social psychology, rural development, negotiation theory, and ethics. Please see Mishra et al. (2017) for more details of the PARTNERS principles which are summarized in **Table 1**. For ease of understanding the principles in a nutshell, they are as follows. **Presence** alludes to the immersion of conservation practitioners to better understand the social-ecological context of a community. **Aptness** encourages practitioners to identify locally relevant interventions. **Respect** urges establishment of equal partnerships with local community. **Transparency** highlights the importance of establishing an honest decision-making partnership with the community. **Negotiation** cautions against taking extreme positional or either-or stances in conflict mitigation. **Empathy** reminds practitioners that conservation and conflict mitigation is often one of many realities of the community. **Responsiveness** emphasizes that timely responses to events are crucial. Lastly, **strategic support** illustrates the importance of formalizing conservation interventions by working using a multi-sectoral approach, including with relevant government agencies.

Our case-study demonstrates how these principles can be used on the ground to co-develop conservation interventions together with local communities to minimize livestock predation by large carnivores. This approach has relevance for conservation agencies across the world who are trying to work together with local communities to implement interventions to reduce livestock predation by carnivores.

PRE-INTERVENTION SCENARIO

A Case Study From the Western Indian Trans-Himalaya

Across the mountain ranges of Central and South Asia, livestock depredation by snow leopards *P. uncia*, wolves *Canis lupus* and Lynx *Lynx lynx* is a concern for the local pastoralists (Jackson and Wangchuk, 2004; Mishra et al., 2017; Samelius et al., 2020). Spread over c. 17,000 km², the Changthang region

TABLE 1 | The eight PARTNERS principles for effective implementation of community-based programs as defined by Mishra et al. (2017).

| Principle | Description |
|--------------------------|---|
| <i>Presence</i> | This principle highlights the importance of immersion by practitioners to gain a nuanced understanding of the community and their way of life in order to build a resilient relationship. |
| <i>Aptness</i> | Aptness centers on ensuring that community-based conservation programs are relevant and sensitive to the local context. This principle urges practitioners to be mindful when scaling up and encourages practitioners to understand the local threats to the species or ecosystem of interest, the ecology of the area, socio-cultural acceptance, the scientific basis of the proposed conservation interventions, the social-economic situation of the community, and its culture and value orientations. |
| <i>Respect</i> | It is easy for conservation practitioners to fall into the trap of viewing local communities as recipients of aid and themselves as providers. This principle guards practitioners against such a pitfall while fostering partnerships with the local communities. |
| <i>Transparency</i> | This principle implies disclosure of one's goals and purpose. It is the conservationists' responsibility to clearly outline the shared conservation objectives, norms and interventions, the roles/responsibilities of all involved, and, the rationale behind choices and their potential effects—including any uncertainties. |
| <i>Negotiations</i> | Every community-based engagement requires negotiations to arrive at a joint agreement. The principle of negotiation encourages conservation practitioners to embrace an integrative approach to negotiation that is grounded in shared information and interests, use of objective standards, incentive building, and tangible stakes in the conservation interventions. |
| <i>Empathy</i> | This principle encourages practitioners to understand conservation from the perspective of local people. What may seem critical to practitioners may seem trivial to the local communities. Thus, empathizing is to understand the local context. It encourages that practitioners consider both rational and emotional aspects into decision making. |
| <i>Responsiveness</i> | Given the dynamism of social-ecological systems, this principle reiterates the need to be responsive to changing threats to biodiversity, to changes within communities, and to the need for addressing any shortcomings in conservation interventions. It also underscores the importance of setting up mechanisms to monitor and periodically evaluate conservation interventions. |
| <i>Strategic support</i> | Governments are often a key stakeholder in conservation decision-making and interventions. This principle highlights the importance of strategic government support to local communities. This can be through policy reforms, management planning and implementation of interventions with proactive involvement of conservation practitioners, and legal support. |

Where applicable, we have highlighted the use of these principles in our case study in brackets.

of Eastern Ladakh is a high altitude rangeland that is inhabited by the Changpa people who practice nomadic pastoralism. This sparsely populated region is home to 22 pastoral villages. Between January and June 2020, 24 instances of small and large livestock depredation by predators (snow leopard, wolves and lynx) were recorded from this region, and 14 of these were incidents of surplus killing inside night-time corrals i.e., when carnivores kill a great many more animals than can possibly be consumed at the time. A single herding community in Sumdoo Tibetan Refugees (TR), consisting of 68 herders (**Figure 1**), reported 12 instances of livestock predation, and 10 of these were instances of surplus killing inside night-time corrals (**Supplementary Material 1**). A total of 102 small-bodied livestock (sheep and goat), 11 yak and two horses were killed in these incidents amounting to a financial loss of c. INR 0.7 million (USD 10,400). Unsurprisingly, the villagers of Sumdoo TR demanded the capture and removal of these carnivores by the Department of Wildlife Protection. A common preventive intervention to this problem is the reinforcement of vulnerable night-time corrals to make them predator-proof. While this intervention has been occurring in Ladakh for over a decade, facilitated by the Department of Wildlife Protection, Sheep Husbandry Department, and various conservation organizations (e.g., Jackson and Wangchuk, 2004; Maheshwari and Sathyakumar, 2019, 2020; Bhatia et al., 2021), our primary aim is to highlight how conservation interventions can be done collaboratively with communities; as often local communities are recipient of interventions rather than being equitable partners in developing and implementing them.

Study Area

The village of Sumdoo TR (**Figure 1**) is located in the Changthang region of Ladakh with 68 predominantly pastoral households. The topography is primarily characterized by undulating terrain interspaced with rugged regions with elevation ranging from 4,000 to 6,000 m. This region is characterized by extreme cold and frigid winters, high aridity, and strong winds. Owing to the relatively low temperatures and low precipitation, the primary productivity is low as well (Rawat and Adhikari, 2005). The growing seasons is restricted to a few months in the summer (June–August) and the vegetation is characterized as dry alpine steppe. The large mammals of the area include Blue sheep *Pseudois nayaur*, Tibetan Wild Ass *Equus kiang*, snow leopards, wolves, and lynx.

The people of Sumdoo TR are ethnically Tibetan. At large, the 68 households are of similar socio-economic background, albeit with some variation which is reflected predominantly in the type of livestock owned. Usually households with smaller holdings were socio-economically worse-off relative to those with larger holdings. While largely pastoralists, most households engage in agriculture which is primarily for livestock fodder during winter.. Unlike other regions in Changthang like Korzok and Hanle, tourism isn't a mainstay of the people of Sumdoo TR.

Livestock herds in Sumdoo TR are managed at the household level and primarily comprise of *Changluk* sheep and *Changra* goat. The *Changluk* sheep, a breed indigenous to Changthang, is predominantly used for meat, while the *Changra* goat yields the pashmina/cashmere fiber that is sold to prospective buyers (Singh et al., 2013). The herders move through the year along with their

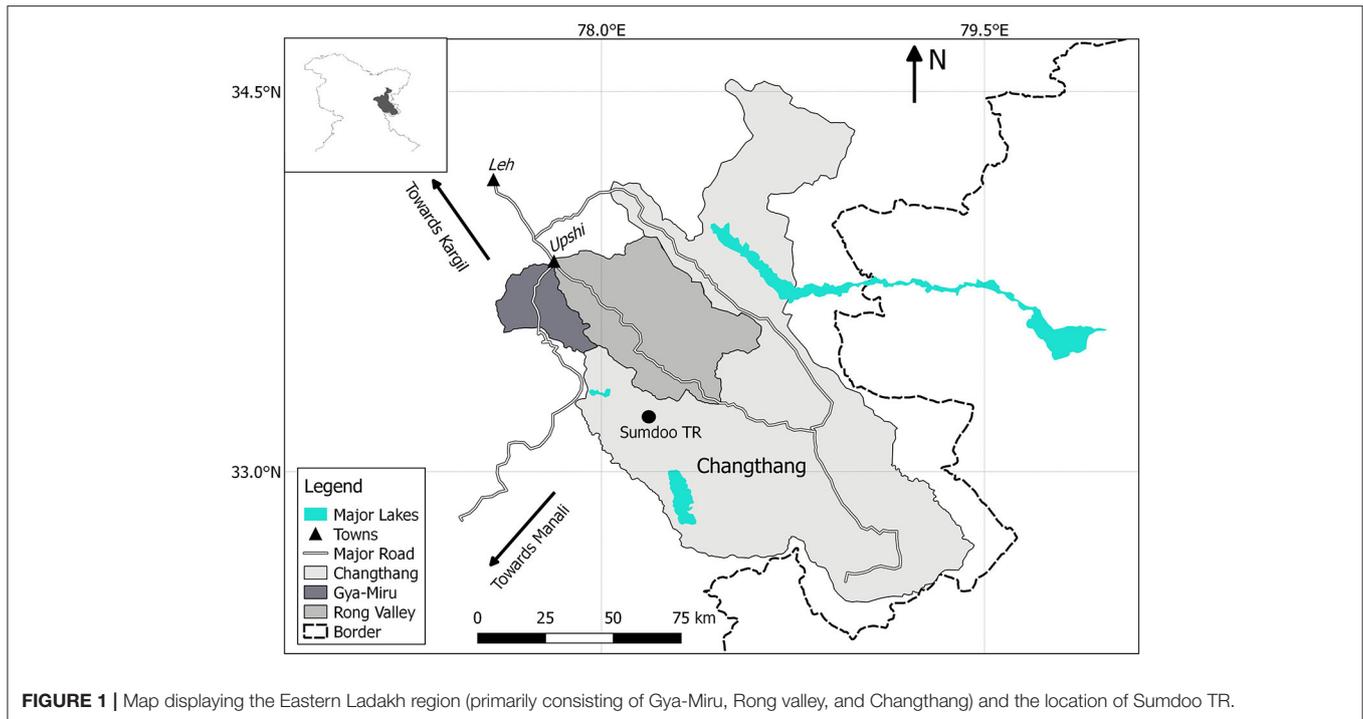


FIGURE 1 | Map displaying the Eastern Ladakh region (primarily consisting of Gya-Miru, Rong valley, and Changthang) and the location of Sumdoo TR.

flocks following a fixed path, spending between a few weeks to a few months in the pastures that are communally accessed by the entire community. The sheep and goat are herded during the day and brought back to night-time corral. Other livestock such as yaks and horses are also kept. These are predominantly free-ranging and only brought back to the village for plowing in the case of yaks, riding and trekking in case of horses, or during severe winter conditions for both.

While the Department of Wildlife Protection and different conservation agencies have engaged in various conservation interventions including predator-proofing of corrals across Ladakh, from our knowledge no such engagement had previously occurred in Sumdoo TR from conservation agencies. The lack of previous conservation engagement along with prevalent negative interactions with predators was the primary reasons we chose to engage in Sumdoo TR. In June 2020, we (members of the NGO Nature Conservation Foundation—NCF led locally by RD and SL) met officers of the Department of Wildlife Protection and jointly decided to initiate work with the Sumdoo TR community (**Strategic Support, Responsiveness; for emphasis, we have indicated the relevant PARTNERS principle being used**).

Positionality of Stakeholders

Agro-pastoral communities across the Central and South Asian mountains have economic and emotional linkages to their livestock. Many of them have been living in these regions for several millennia (Mishra et al., 2017). Most of these rangelands are outside formal strictly Protected Area network, therefore, people and wildlife tend to live in close proximity (Mishra, 2016). This is true for the villagers of Sumdoo TR as well. Locally, while there are some positive symbolic associations of predators such

as snow leopards and wolves, these are overwhelmingly limited compared to negative sentiments because of their tendency to prey on livestock (Bhatia et al., 2021). Consequently, herders often retaliate against carnivores to protect their livestock (Suryawanshi et al., 2013).

The Department of Wildlife Protection in Ladakh is the primary government agency responsible for wildlife protection and conservation. They have primarily a legislative and enforcement role. However, administering all of Ladakh (c. 60,000 km²) with a small team, in difficult field conditions, and with limited resources, is challenging. NCF's team comprised of conservation practitioners from Ladakh and other parts of India. Both the members (RD and SL) that worked directly with the local community are Ladakhi, while three non-local members (AB, MK, and KS) gave inputs and guided the process over a series of audio calls. Each of the local and non-local members have over 5 years of experience working across the Indian trans-Himalayas. NCF's overall aim is to partake in socially responsible conservation which in our context includes facilitating positive-human relationships (Mishra et al., 2017).

THE INTERVENTION

Co-designing the Intervention

Having engaged in predator-proofing of over 100 corrals with several communities in Ladakh and Himachal Pradesh over the past decade, we were aware that pre-determined corral designs can be built quickly and efficiently. However, not factoring in the communities' views in implementation could also lead to the community questioning the effectiveness of the intervention and continuing their demand for removal of the carnivores

from the region. This is problematic, not least because relocated predators are known to cause higher incidence of negative human–wildlife interactions (Athreya et al., 2011). Persistence of this situation could also lead to long-term distrust between the community and conservation agencies. An ineffective corral design can affect the health and well-being of the livestock and in some cases fail at preventing depredation (**Empathy**). Our efforts in Sumdo TR were guided by multiple Focus Group Discussions (FGD) (Nyumba et al., 2018) while ensuring that views of all the community members were sought and taken into consideration at every step along the way (**Aptness, Respect, Negotiation**).

We (RD) started by meeting the village heads to explain our intentions (**Figure 2A**). The discussion was subsequently expanded to include the whole village to ensure that everyone could participate (**Respect**). These two meetings over the span of 2 days formed the basis for the community engagement. We ensured clarity in communication, i.e., we wanted to understand existing conservation conflict and subsequently assess how we could jointly identify and implement a preventive solution (**Transparency**). We also spoke about various interventions that are used to mitigate impacts of livestock depredation in other agro-pastoralist communities in the trans-Himalayas (e.g., reinforcing corrals and community-run livestock insurance programs). These meetings confirmed that snow leopard and wolves had caused depredation in night-time corrals, and reinforcing them would be the most effective solution. Corrals in winter pastures seemed particularly vulnerable to depredation (**Aptness**). Due to resource and time limitations, we mutually agreed to reinforce/rebuild corrals in the winter pastures that were at a higher risk of being attacked by predators (**Transparency, Negotiation**). Community members agreed that predator-proofing of corrals could help, but only if the design was locally relevant (**Aptness**). The people of Sumdo TR constituted a committee of four people from the village who were to lead the discussions on behalf of the community. This committee was tasked with coordinating the effort with NCF and discussing key points with the entire community so that fair decisions could be taken through community-level consultations (**Transparency**). An experienced NCF staff from Ladakh (RD) led the entire effort thus building trust from the outset (**Presence**).

Herders highlighted that they bred *Changra* goats to produce pashmina (cashmere) wool. They listed specific design requirements for the corrals to ensure the health of their animals and wool production: (i) the chilly winter winds facilitate wool growth hence it was important for structures to allow breeze to circulate; (ii) since this region receives snowfall, it was critical that the structure prevented snow from collecting within the corral and allow the wind to blow it off. A logistical challenge was that this region has very few stones—a key resource that is necessary for constructing the walls of the corral. The design had to be such that requirement of stones was minimum. These requirements were specific but needed careful consideration (**Aptness**). In the third meeting with the community, we shared designs from our experience and from conservation science literature (e.g., Samelius et al., 2020), and discussed the benefits and shortcomings of each (see **Supplementary Material 2** and

Table 2). During this meeting, herders also provided designs based on their personal experiences and local understanding. The herders developed a design that was inspired by the shape of tent, one that requires less construction, provides better access to sunlight, and allows for wind to pass through the structure (**Figures 2D,E**). Key components of this design were essentially that sunlight could enter in the day to dry the soil inside and shorter walls so that wind can blow. All the designs were collated and tabled before the corral-building committee in order to start a wider consultation with the community (**Transparency**).

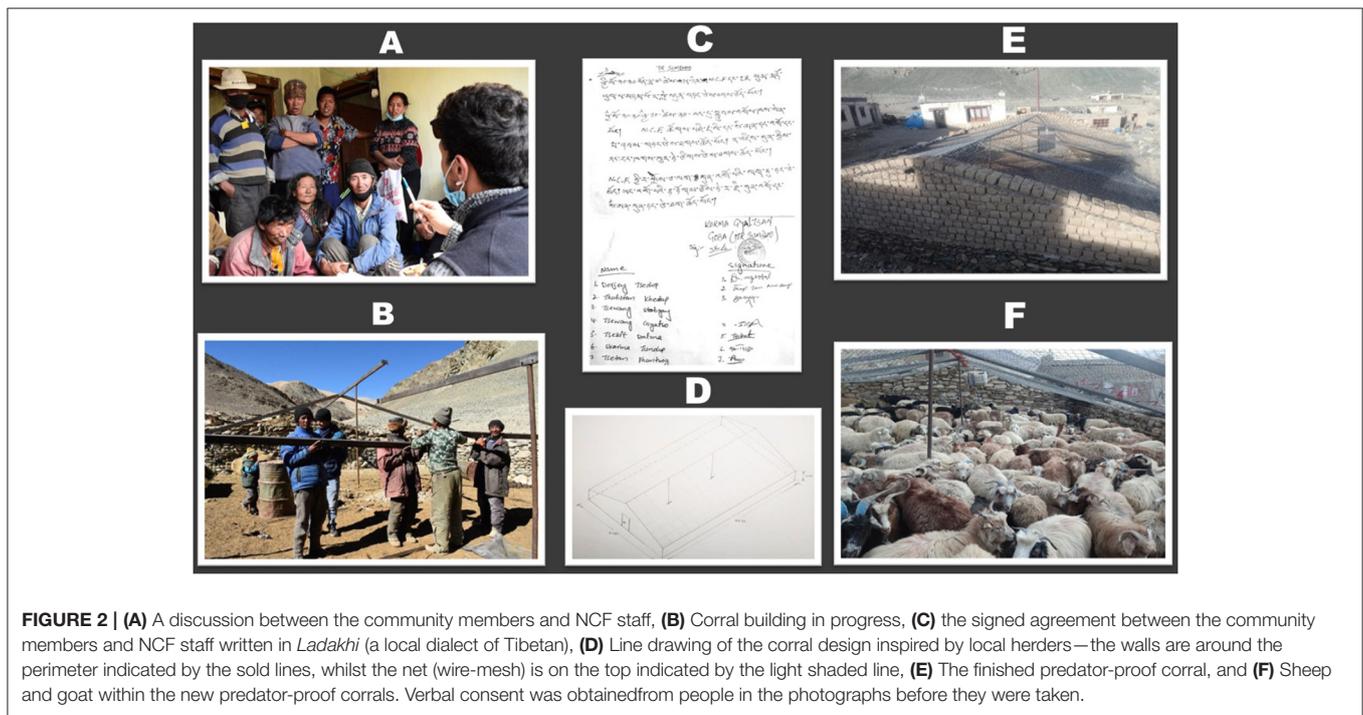
Arriving at the Solution

In the fourth meeting, we held a round of discussion with the corral committee of the village to identify the optimum design for the corrals. It was evident that the design suggested by the herders was the most suitable while the other options would either prove suboptimal or difficult to implement (**Negotiation**). Line drawings of this new design were made and vetted by experts of snow leopard and wolf ecology from the Snow Leopard Trust (**Figure 2D**). This was done as an additional means to triangulate the **aptness** of the new design. Interestingly, the experts' knowledge on snow leopard and wolf behavior with respect to depredation corroborated with the knowledge of the herders. To check for the structural soundness, we also took advice from local civil engineers and fabricators in Leh—the regional headquarter (**Aptness**). These inputs provided critical adjustments to the design and were also crucial in accurately estimating their cost.

Based on the estimated costs, in the fifth meeting, we mutually agreed to start the effort with the construction of seven corrals. The community helped decide which seven corrals would be re-built based on their perception of risk of depredation and their size. Led by the village headman and the corral committee, the villagers produced a list of most vulnerable corrals in the village. As corral sizes are linked to livestock number, which in turn reflects the socio-economic status of a household in Sumdo TR, the village headman, and members of NCF negotiated with villagers to factor in corral sizes along with risk to predators in producing the vulnerable corral list (**Negotiation**). Corrals of different sizes that were at high risk were chosen for predator-proofing, so that this could prove a useful test case. In Sumdo TR, each corral belongs to an individual family. Four of these corrals were built in or near the village in relatively flat terrain, while three were built close to cliffs in rugged regions. These seven corrals housed 1,840 sheep/goat, which accounted for nearly 15% of the total livestock in the village. A written agreement was prepared in *Ladakhi* (the local dialect of Tibetan) between the community and NCF (**Figure 2C**) outlining timelines, milestones, and the responsibilities that each would, respectively, fulfill. NCF was responsible for providing fabricated materials and its transportation, while the herders were responsible for construction of the corrals (**Figure 2B**). If a selected corral owner did not follow timelines, the corral committee had identified backup corrals that would be supported through this pilot effort. A copy of the agreement was kept with the community, while another copy was kept with NCF (**Transparency**).

TABLE 2 | Reports the benefits, challenges, and arrangements required for each designs, in particular in the Changthang region of Ladakh.

| Design | Benefits | Challenges |
|-------------------------------|--|---|
| Traditional | Tested design that has been used successfully in other parts of Ladakh Simplicity of design | Needs large quantity of stones to build the walls. The structure could reduce or completely prevent wind through the corrals. High walls may reduce access to sunlight inside the corral during winter. Soil inside the corral likely to remain wet due to lack of sunlight, livestock could be prone to disease. |
| Tent | Design proposed by the herders and NGO partner checked its potential efficacy through ecological experts. The proposed design was also validated by engineers for its structural strength. Fulfills all requirement. | Untested design that needed piloting. Needed to be constructed under skilled supervision since design elements required attention to detail and structural strength. |
| Fenced Samelius et al. (2020) | Simple design, tested successfully in another region. No additional construction of structures required in areas of undulating terrain, hence requirement for additional stones is canceled. | The design is not suitable for areas around cliff and high rocks. Many of the vulnerable corrals were near such structures. Would require the herders to shift their original corral and reconstruct them in open areas, away from cliffs and rugged areas. Expensive with need for electric fence, solar panels and batteries. Maintenance requires technical knowhow. |



Implementing the Solution

It was important to complete the construction before the coming winter and given the novelty of the design, NCF’s field team and the corral committee were closely involved in monitoring the construction along with the corral owner. This process was not without unanticipated challenges. For example, in one instance some of the corral owners delayed the start of construction from the agreed timelines. In this case the corral-building committee stepped in to understand the cause of the delay and when it was verified that these delays were for genuine reasons, they agreed to a marginal relaxation in timelines (**Empathy**). In another

instance when fabricated material was incorrectly designed, the herders remained patient with the NCF team and worked jointly with them and the manufacturers to have these corrected, despite this leading to some delays. All seven corrals were constructed and put to use by November 2020, before the onset of winter.

POST-INTERVENTION SCENARIO

The cost of building each of the corrals in Sumdoo TR was higher than most of the previous corrals built by NCF in

Ladakh and Himachal Pradesh. This was because most of the previous corrals were much smaller and housed fewer livestock. Nonetheless, the Sumdoo TR corrals were more cost effective per livestock. In most communities where NCF has worked before, livestock is mostly corralled indoors, hence predator-proofing essentially entailed reinforcing the doors and windows of pre-existing structure. However, in Sumdoo TR entire structures were needed to be made. Our field team returned to Sumdoo TR in March 2021 to check how the corrals had fared over the first winter. We conducted a FGD with the village headman and all the seven herders whose corrals were reinforced (Nyumba et al., 2018). All seven herders had used the corral through the winter and housed all the 1,840 sheep/goats. Herders did not report any instance of depredation in any of the re-built corrals. Herders believed the new structures did not negatively impact wool growth of their *Changra* goats and were effective in preventing snow from accumulating inside. The herders are confident that periodic repairs or maintenance that these structures may require can be handled by them with minimal support using locally available resources. The seven herders reiterated that not having the new corral design would have likely meant accumulation of snow during the winter which often leads to livestock deaths due to hypothermia (Yatoo et al., 2014). While this indicates the success of the structures, how they persist in the long-run needs careful monitoring (**Aptness**). In depth details regarding visitation of predators to these structure also needs to be monitored. The village headman suggested during the FGD that demands for removal of carnivores have reduced as a result of this intervention, and the trust that has been built between the herders and conservation agencies. In another follow up visit in September 2021, we visited each of the seven herders individually as they were placed in dispersed summer camps, away from the village. They confirmed the structures were in good condition and the same seven herders are planning to use them in the upcoming winter. We visited the structures as well and confirmed their condition. Empowering the herders of Sumdoo TR to implement their preferred solution to a conservation problem also ensured that all this work could be done even during Covid-19 restrictions, which were particularly stringent with respect to outsider entry into Ladakh. After the success of the first seven corrals, herders of Sumdoo TR and NCF are now in discussions to re-enforce the remaining existing corrals in the village. In the September 2021 visit, seven new corrals were identified by the community to be reinforced. This is inspired by the PARTNERS approach which emphasizes the importance of long-term partnerships with local communities (Young et al., 2021).

CONCLUSION

While there are multiple frameworks to engage communities in conservation (e.g., Berkes, 2007; Mishra et al., 2017), operationalizing these is challenging. We demonstrate how the PARTNERS principles framework for community based conservation (Mishra et al., 2017) could be used on the ground

to effectively implement conservation interventions together with local communities. NCF provided most, if not all, design inputs in corrals built or reinforced in communities before the engagement in Sumdoo TR. Employing the PARTNERS approach with the Sumdoo TR community highlighted that empowering the community to design and implement a conservation intervention resulted in them taking ownership of the effort, building trust with conservation agencies, and hence is potentially a long-term solution to conservation conflicts in the region.

At the outset, a good working relation with local government agencies and an experienced field team facilitated a timely response to a situation of acute conflict. Building presence took time, but was vital in establishing mutual trust and this was boosted by having local Ladakhi team members. A community although a collective, is often a heterogeneous mix of individual aspirations, thought processes, and opinions (Mishra, 2016). Engaging with the wider community helped us understand the challenges being faced and a possible solution relevant to the local context. For instance, often during the various meeting in Sumdoo TR, there was diversity of perspective on topics concerning which corrals were most vulnerable and what the most appropriate design would be. The various members of the community and the NGO were provided the same platform—the community meetings—to bring their expertise while remaining open to explore possibilities. Rather than imposing thoughts or actions onto the community members, we tried to facilitate a consultative process, which was led by the village headman.

Creation of unrealistic expectations by local communities from conservation organization can be an unintended output of community engagements (e.g., Dahlberg and Burlando, 2009). To safeguard against this, transparent and clear communication allowed for a time-bound agreement with fixed roles, responsibilities, and expected outcomes. Despite challenges and occasional delays, the work was completed on time and to the prescribed design. As part of this effort, the herders were not merely recipients of support; they were part of setting up the solution to prevent livestock depredation by carnivores. The co-developed solution relied on local knowledge of the herders thus ensuring that it was locally relevant.

While there is growing recognition for conservation to be evidence-based (Sutherland et al., 2004), we believe there is an equal need for it to be context-based and inclusive of local traditional knowledge. This is an important step in de-colonizing conservation, dismantling discrimination, and achieving inclusion and representation (Chaudhury and Colla, 2020; Trisos et al., 2021). Prioritizing external ideas—often more technically sophisticated—over local traditional knowledge can create a deep-seeded sense of discrimination leading to long-term conservation conflicts. The knowledge and experience of the local community, who are the primary stakeholder in a conservation situation, needs to be considered on a par with conservation evidence coming from other parts of the world. Without this sensitivity conservation interventions risk becoming technocratic solutions. We believe

that equitable partnerships between local communities and conservation agencies can help local communities be (and see themselves as) a part of conservation solutions rather than conservation problems.

AUTHOR'S NOTE

Ajay Bijoor works with local communities and government agencies to plan and implement conservation action in parts of Ladakh and Himachal Pradesh in India. In over 10 years of experience, Ajay has worked with community partners to implement interventions including reinforcing nearly 50 livestock corrals and coordinating several community-based livestock insurance programs to facilitate human-wildlife coexistence. Alongside, he works with government agencies to implement various projects such as the Project Snow Leopard within India. He also supports research activities and is Assistant Program Head of the High Altitude Programme in NCF.

Munib Khanyari is interested in studying various factors that affect human-wildlife coexistence. While Munib's Ph.D. topic is to study disease transmission between wild and domestic ungulates in Trans-Himalayan India, he aims to support his colleagues who work with local communities to mitigate negative human-wildlife interactions.

Rigzen Dorjay has been leading on-ground conservation efforts such as building predator-proof corrals, creating village reserves for wild herbivores, instituting, and helping run livestock insurance programs, and conducting wildlife surveys in remote corners of his homeland, Ladakh, for over 7 year. He hails from Saspoche village in Ladakh.

Sherab Lobzang has been working for over 5 years toward nurturing positive human-nature relationships primarily through education modules and other on-ground conservation efforts across Ladakh. These include predator-proofing of corrals, wildlife surveys, and livestock insurance programs. She hails from an agro-pastoralist family in Kumdok village, Ladakh. She has had first-hand experiences of the various interactions pastoralist experience with wild carnivores in the landscape.

Kulbhushansingh Suryawanshi splits his time between conservation practice and conservation science. Over the past 15 year he has worked across the mountains of Central and South Asia. He has been helping set-up and guide on ground conservation efforts to facilitate co-existence between local pastoral communities and large carnivores. He has helped set-up and run conservation programs such as SHEN—an initiative to help local people, especially women, to earn a livelihood and engage with conservation, Snow Leopard Friendly Pashmina to help herders make their practices more wildlife friendly, livestock insurance, predator-proofing corral, and village reserves.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

RD led and coordinated the work on ground and assisted in this by SL. AB and RD conceived the project with critical inputs from KS. MK provided inputs throughout the life of the project. AB led the writing of the manuscript, with help from MK. KS critically revised the manuscript. All authors gave final approval for publication.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/fcosc.2021.766086/full#supplementary-material>

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