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Debate

Relocation from Wildlife Reserves in the Greater and Trans-Himalayas: Is it Necessary?

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Abstract

The Greater and Trans-Himalayan tracts are cold deserts that have severe seasonal and resource scarce environments. Covering the bulk of Indian Himalayas, they are a rich repository of biodiversity values and ecosystem services. The region has a large protected area (PA) network which has not been completely effective in conserving these unique values. The human population densities are much lower (usually < 1 per sq km) than in most other parts of the country (over 300 to a sq km). However, even such small populations can come into conflict with strict PA laws that demand large inviolate areas, which can mainly be achieved through relocation of the scattered settlements. In this paper, I reason that in this landscape relocation is not a tenable strategy for conservation due to a variety of reasons. The primary ones are that wildlife, including highly endangered ones are pervasive in the larger landscape (unlike the habitat 'islands' of the forested ecosystems) and existing large PAs usually encompass only a small proportion of this range. Similarly, traditional use by people for marginal cultivation, biomass extraction and pastoralism is also as pervasive in this landscape. There does exist pockets of conflict and these are probably increasing owing to a variety of changes relating to modernisation. However, scarce resources, the lack of alternatives and the traditional practice of clear-cut division of all usable areas and pastures between communities make resettlement of people outside PAs extremely difficult. It is reasoned that given the widespread nature of the wildlife and pockets of relatively high density, it is important to prioritise these smaller areas for conservation in a scenario where they form a mosaic of small 'cores' that are more effectively maintained with local support and that enable wildlife to persist. These ideas have recently gained widespread acceptance in both government and conservation circles and may soon become part of national strategy for these areas.

Keywords: wildlife reserves, relocation, Greater Himalayas, Trans-Himalayas

INTRODUCTION

THE GREATER AND THE TRANS-HIMALAYAN cold deserts biogeographic zones are spread over *c.* 400,000 sq km (12 percent) in India and cover more than the entire Gangetic basin (Rodgers & Pawar 1988). These high mountains and plateaus occur *above* the forested zone and have a unique biodiversity that includes large mammalian species like the snow leopard (*Panthera uncia*), the brown bear (*Ursus arctos*), the Asiatic ibex (*Capra sibirica*), the Tibetan argali (*Ovis ammon hodgsoni*), the chiru or the Tibetian antelope (*Pantholops hodgsonii*), the Ladakh urial (*Ovis vignei vignei*), the takin (*Budorcas taxicolor*), the serow (*Nemorhaedus sumatrensis*) and the musk deer (*Moschus* spp.) (Das 1966), all of which are nationally and globally threatened species (IUCN 2004; IWLPA 2002). These areas are the headwaters for most north Indian rivers and also provide numerous ecosystem services that are important for the dense human populations downstream and in the Indo-Gangetic plains. What is probably more unique is that most of this wildlife is not limited to the rather large existing protected area (PA) network in the region, but can be found in the wider landscape, including very close to semi-urban centres such as the town of Leh in the Ladakh region of Jammu and Kashmir (Bhatnagar & Wangchuk 2001; Bhatnagar *et al.*

2002). The sparsely populated landscape where the human density is mostly < 1 per sq km (compared to about 300 per sq km national average) also has pervasive resource use, which extends into most of the existing PAs. The predominance of Buddhism in the region which values life, the relatively low human densities and lack of interest so far in setting up large developmental projects, have probably been crucial for human-wildlife coexistence. Things are, however, changing and this relatively harmonious coexistence is in jeopardy. Yet, most conservation design and practice in the country, and in fact, globally, appears to be geared towards forested areas that are species rich, especially the tropical rainforests (MacKinnon *et al.* 1992; Das *et al.* 2006; Pawar *et al.* 2007). Further, nationally, forest-dwelling flagships such as the tiger (*Panthera tigris*) and the Asian elephant (*Elephas maximus*) have occupied and guided mainstream conservation for the most part (Rangarajan 2001, 2007). The 'one-size-fits-all' system of conservation that is developed from the forested ecosystems is to the detriment of the more diffused systems such as the marine areas (Sridhar & Shankar 2007), and as is reasoned in this paper, for the high altitudes.

There are presently close to 30 PAs in this region covering about 32,000 sq km (about a quarter of the geographical area). This is a territorial spread roughly equal to that of India's tiger reserves; but the mountain and alpine nature reserves appear to be much more marginal to the consciousness of policy makers, activists and even scientists (PSL 2006). These PAs include some large ones such as the Karakorum Wildlife Sanctuary (WLS) (*c.* 5,000 sq km), the Changthang WLS (*c.* 4,000 sq km), the Hemis National Park (NP) (*c.* 3,350 sq km), the Kibber WLS (1,400 sq km), the Nandadevi NP (5,150 sq km), the Kanchendzonga NP (1,784 sq km) and the Dibang WLS (4,149 sq km), to name a few. It has, however, been widely recognised that conservation has mostly remained nominal inside these PAs due to poor infrastructure including low staff strength, improper designation of boundaries that include many settlements (e.g., the Karakorum WLS), disputed international boundaries (e.g., the Karakorum and the Changthang WLS), lack of implementation of park rules or the inability or incapacity to implement these (Bhatnagar *et al.* 2002; PSL 2006). A case in point is the fact that *virtually all* PAs barring a very few like the Nanda Devi NP, continue to have settlements and/or are subject to pervasive human use. Attempts at relocation were made in the Pin Valley NP, Spiti, in the late 1990s, but was met with stiff resistance. There have been debates about strategies in specific reserves like the Great Himalayan NP and also on the variable impacts of grazing on biotic communities (Saberwal 1996; Mishra & Rawat 1998). But much less has been said or considered about whether or not human settlements ought to remain or need to be relocated (Pandey 2008). More so, discussion on how to address human issues in very large PAs, as in the above mentioned ones measuring many thousands of square kilometres, with numerous permanent and seasonal settlements and pervasive use, is virtually absent. Most of these large PAs often include glacial and uninhabitable tracts in over half their areas. How the management restricts development pressures and tackles human use in these large areas is a challenge that needs to be addressed with urgency. A case in the Supreme Court of India entitled Centre for Environmental Law, Worldwide Fund for Nature India vs Union of India (W.P 337 of 1995) asking the state governments to notify boundaries and settle rights has put added pressure on states to finally take action regarding human settlements. While in principle, this is a positive move, the danger is that with immense social and political pressure PAs may be denotified or boundaries may be redrawn to accommodate the burgeoning human use, which may not make much biological sense (Kothari 2000). Thus, what needs to be considered is whether we should continue with the present large PA model or rethink and designate more biologically meaningful, but smaller PAs under the framework of the classical SLOSS (Single Large or Several Small) debate of the 1970s (Diamond 1975; Simberloff & Abele 1976; Terborgh 1976; Simberloff & Abele 1982).

Relocation is seen as a means of removing biotic pressures from an area valued for biodiversity resources by removal of habitations and by settlement of rights that allow the PA management to stop or regulate any form of human use in the region. An important assumption in using relocations as a primary tool in wildlife management is the belief that all activities of humans (including the native ones) are harmful to the ecosystem (Saberwal *et al.* 2000; Saberwal & Rangarajan 2003). To some extent this may be true in cases where forests have been denuded due to overexploitation or where 'empty forests' occur due to excessive local hunting (Schaller 1967; Dangwal 2005). In this paper I reason that it is important to understand local nuances of each landscape and contend that relocation may not be appropriate for the Indian high altitudes while presenting a case for participatory planning for smaller manageable conservation landscapes. The regions we are talking about lie above *c.* 3,000 m in the western and above *c.* 4,000 m in the eastern Himalayas, are spread in the five Himalayan states of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Sikkim and Arunachal Pradesh (Table 1), and cover substantial proportions of each of these states (mostly between 20 to 60 percent).

From west to east, the precipitation follows a trend of winter westerly disturbances giving way to increased summer monsoonal activity and a general decline in aridity. The region is not very conducive for agriculture and barely one crop of barley, buckwheat, local peas and some vegetables is managed in some places during the short summer growth season that extends for 3–5 months

Table 1
The extent of high altitude areas in the five Himalayan states

State	Potential high altitude area (sq km)
Jammu and Kashmir*	77,833 (61)
Himachal Pradesh	27,846 (50)
Uttarakhand	13,885 (23)
Sikkim	3,031 (36)
Arunachal Pradesh	6,162 (8)
Total	128,757

Note: Approximate percentage of each state's area falling under high altitudes is given in parenthesis. The figures for the western Himalayas include areas above 3,000 m and those for the eastern Himalayas are above 4,000 m. Estimates are based on Digital Elevation Model from Shuttle Radar Topography Mission.
*Includes only area within Indian administrative control, i.e., within the Line of Control with Pakistan and the Line of Actual Control with China.

(Mishra *et al.* 2003). The livelihoods of most people is thus sustained primarily through pastoralism that includes herding large-bodied stock such as yak (*Bos grunniens*) and cattle in the more lush areas of the east, to sheep and goats, especially the cashmere goats (*Ovis aries*), in the drier tracts of the west (Rizvi 1996; Ahmed 2002, 2004; Tambe 2007). Over millennia these people have eked out a living from this desolate landscape and harsh climate through strategies such as mixed species stocking with large herds to overcome stochastic die-offs (Mishra *et al.* 2003), seasonal movements to take advantage of varying spatial nutrition distribution (Ahmed 2004), cultivation in the limited arable land where irrigation is through snow melted streams (Gill 1972), and polyandry that can keep a check on split in households and thus the division of property (Gill 1972; Ahmed 2002; Mishra *et al.* 2003). Most of these strategies had averted the depletion of preferred forage, providing respite to the rangelands through rotational use, kept a check on population size of both humans and livestock, and ensured relative self-sufficiency in grains. Most communities were also involved in active barter trade within regions, and also from across the international borders (which has now been mostly replaced by a cash-based economy). All these strategies were also probably close to an ideal means to utilise the sparse natural resources in a sustainable manner. Finding alternatives to this lifestyle in the context of the major changes in the recent years may pose a great challenge, and some dimensions are discussed below.

Geopolitical events such as the Sino-Indian war of 1962 and increased governmental attention to the region have changed the Indian high altitudes and the traditional processes, in some ways, for the better, and in some, for the worse. Now there is a relatively greater access to roads, health and veterinary care, controlled price rations, education and slightly better employment opportunities. However, most of these positive developments have led to other concerns such as increase in human and livestock population, alienation from local culture and their sustainable values, and the ultimate commercialisation of most practices (Norberg-Hodge 1981; Fox *et al.* 1994; Ahmed 2004; Hagalia 2004; Bhatnagar *et al.* 2006a; Namgail *et al.* 2007a; Bhatnagar *et al.* 2007). Inevitably such developments have raised aspirations among the inhabitants, in a landscape with extremely limited renewable resources, where alternatives are scarce and hard to attain. In parts of Ladakh, Spiti, Uttarakhand and Sikkim, tourism is often seen as the only alternative livelihood, but as discussed by some (PEACE 2007), this still has a limited spread due to security concerns and poor infrastructure.

Primary Threats

I mentioned above that wildlife in the Greater and Trans-Himalayas are pervasive and gaps are mainly natural. However, with increasing pressures this is changing and breaks are appearing due to human-induced causes too. Overgrazing by livestock in the Trans-Himalayas is known to have caused depletions and local extinction of some species (Mishra *et al.* 2002; Bhatnagar *et al.* 2006a, b). Poaching, also an important threat, had depleted species such as the Ladakh urial and the Tibetan gazelle (*Procapra picticaudata*) in Ladakh (Fox *et al.* 1991), and remains an important threat in Kashmir, Jammu, Lahul, Uttarakhand and the northeast (Kaul *et al.* 2004; Ranjitsinh *et al.* 2005; *pers. observ.*). Increasingly developmental works such as hydro-electric projects and highways are becoming locally important in all regions of the Himalayas, especially in parts of Sikkim and Arunachal Pradesh (Dutta 2008). The entire region is influenced by the international borders, most of which are disputed with China and Pakistan, and guarded by heavy military presence. Many security related aspects have now fragmented the habitat for species, including the construction of permanent impenetrable fences that have blocked movements of the Kashmir markhor (*Capra falconeri*) and numerous other species along the Line of Control with Pakistan (Ranjitsinh *et al.* 2005). Awareness among a variety of interest groups—from villagers, school children, local officials, politicians, defence personnel and decision makers—is extremely limited (Trivedi *et al.* 2006); and this becomes a limitation in understanding issues and formulating strategies for conservation. Many of these threats can be dealt with primarily by innovative and participatory conservation programmes and not simply by designating PAs, especially large ones. A case in point regarding the large reserves comes from adjacent, similar landscapes in central Asia. Here, there are some extremely large reserves, the largest one being the Changthang wildlife preserve (over 500,000 sq km) in Tibet, China (Schaller 1998). Most of this reserve is un-

inhabited and is above the zone where most large mammals can survive. Size, however, doesn't help protect the wildlife as hunting is an important threat even in this remote corner (Schaller 1998) and the same is true in many areas of central Asia such as Mongolia, Afghanistan and the Commonwealth of Independent States (Koshkarev 1994; Reading *et al.* 1999; Milner-Gulland *et al.* 2001).

Is Relocation Necessary in these Areas? What are the Alternatives to Relocation?

Relocation of villages and stoppage of use may have beneficial effects on forest ecosystems [e.g., Chilla range of the Rajaji NP where Gujjars have been relocated (Johnsingh 2006; Harihar *et al.* 2007), Kuno WLS (Sharma & Kabra 2007) and Bhadra Tiger Reserve (Karanth 2007)] where other tribal people have been relocated; while in other cases such benefits are doubtful [Valley of Flowers NP (Kala 2004)]. Considerable literature is now available that, however, point out the marginalisation of already marginalised communities (review by Brockington & Igoe 2006; Kabra 2007). In the area of concern of this paper the biotic effects of human activities are being explored, and it is apparent that negative consequences of activities such as livestock grazing and poaching can be detrimental to the survival of wildlife in some areas (Mishra *et al.* 2004; Ranjitsinh *et al.* 2005; Bhatnagar *et al.* 2006a, b). However, it has recently become clear that by developing an understanding of the exact nature of the damage, specific solutions can be worked out with the community and other stakeholders that do not include resettlement (Mishra *et al.* 2003; Bhatnagar *et al.* 2007). As an example a recent study (Bhatnagar *et al*. 2006a) showed that the decimation of the Tibetan gazelle in Ladakh was primarily as a result of intensification of livestock grazing due to a variety of geopolitical and social factors since the 1960s. Once the processes were better understood (Bhatnagar *et al.* 2006a; Namgail *et al.* 2007b) a conservation strategy was designed with the community and the Forest Department which included habitat improvement, better protection and a modification of grazing patterns, based on incentives and not exclusion (Bhatnagar *et al*. 2007).

In an experiment to identify the process and outcomes of freeing areas from livestock grazing, beginning in about 2001, it was demonstrated that communities can be persuaded to set aside areas they will not use, on the basis of incentive-based agreements with them (Mishra *et al.* 2003). Such an area in the Kibber WLS began with just 5 sq km and has now expanded to over 15 sq km. The bharal or blue sheep (*Pesudois nayaur*) population density in the region has more than trebled in 6 years, and there has also been a substantial increase in signs and sightings of snow leopards through this community effort catalysed by the Nature Conservation Foundation, Mysore (C. Mishra 2008 *pers. comm*.). The snow leopard is a globally endangered species and the bharal is its primary prey in the Himalayas. This idea has been at the centre stage of a model to be explored further and applied, instead of large, less effective PAs (Bhatnagar *et al.* 2002; PSL 2006). Mishra *et al.* (in prep.) further explain that in a landscape where most areas have biodiversity values, making large exclusionary PAs is not the best model. In the SLOSS debate (Diamond 1975; Simberloff & Abele 1976; Terborgh 1976; Simberloff & Abele 1982), the proponents of single or few large areas used maintenance of viable populations of large mammals, especially carnivores that require large home ranges, as the primary criteria for proposing this. The other reasons included minimising edge effects and encompassing more species and habitat diversity (Diamond 1975). These ideas developed from the theory of island biogeography proposed by MacArthur and Wilson (1967), which considers wildlife habitats as 'islands' surrounded by a 'sea' of non-habitat. As mentioned above, the biodiversity values in the Greater and Trans-Himalayan tracts are widespread in the landscape and the 'habitat islands' seen in the forested ecosystems are very uncommon here. The divisions and breaks in connectivity are mostly natural in the form of glacial expanses, very high ranges and big rivers. In such a scenario the basic assumptions underlying island biogeography, and thus large PAs, is not satisfied. The abundance of wildlife and other biodiversity values may vary from small pockets of high abundance to areas where species may have gone locally extinct. For example over 50 percent of occurrence of highly endangered species such as the snow leopard, the Ladakh urial and the Tibetan argali in Ladakh is outside the large PA network (Chundawat & Qureshi 1999; Bhatnagar & Wangchuk 2001). If all these areas have to be brought under one PA, the entire Ladakh region covering over 44,000 sq km will need to be made into one vast PA. This is clearly an impractical proposition given the present exclusionary PA laws as also the severity of the landscape, climate and the poor staffing of the conservation implementation agency. However, if each or most of the small biodiversity rich sites are secured, then in a system where the habitat is mostly contiguous and the 'sea' of non-habitat doesn't exist, we can expect long distance gene exchange and persistence of populations.

In the social context, large exclusionary PAs will involve displacement of an already marginalised community that depends on extremely sparse resources and often lack skills for any other livelihood (Ahmed 2004; PEACE 2007). It may also curtail the use of resources by them in all or most parts of their traditionally used landscape. There are also other cases where the resource catchments of settlements are cut off due to a park (Butz 2002). Effective alternatives for a large number of dispersed households in this fashion is not possible given the low levels of industrial and other employment opportunities

available at present or possible in the near future. For smaller areas there are likely to be fewer households for negotiations regarding stoppage or regulation of use, which may be for the entire year or for certain critical periods.

Based on these ecological, management and social contexts, it is suggested that it will be more prudent to opt for a mosaic of several small biologically meaningful and socially acceptable PAs in the Greater and Trans-Himalayas that are maintained with community support or by the community, rather than a single or few large ones (PSL 2006; Bhatnagar *et al.* 2007). Conservation efforts can thus be more effectively directed to these smaller areas (10–100 sq km) that may result in species persistence with local support and may involve more flexible resource access arrangements (see example on the Hemis NP below) or compensation via local mediators (as in the Kibber example). It is, however, imperative to build it in as a constant and on-going engagement. These 'cores' can act as 'source' populations for wildlife that can allow their persistence in the larger landscape. This will also need a commitment for joint management of areas so that genuine issues of the traditional users of the area are also met. Proactive management will, however, be needed for mitigating conflicts, addressing alternative livelihoods, ensuring habitat quality and adequate awareness in the 'cores' and intervening areas. Similar innovations have been tried in Nepal where management of the Annapoorna NP is being done jointly (Parker 1997) using adaptive management.

I further discuss the issue of the suggested process through this example of the Hemis NP in Ladakh, Jammu and Kashmir, that is spread over 3,000 sq km and has merely 17 villages with *c.* 100 households (Bhatnagar *et al.* 1999). Compared to the scenarios in the Kanha NP and the Kuno WLS (Rangarajan & Shahabuddin 2007), these figures might appear insignificant, however, there are many distinctions in this case. The primary one is that there are no alternatives for the people and possibilities of diversifying livelihoods in the future also may be very dim. The people are herders who may also cultivate in summer. The cultivable area is limited by the very small patches of arable land that are usually restricted to alluvial fans fed by seasonal streams. This limits such cultivated land to a miniscule fraction of the total landscape [e.g., the figure for Ladakh is < 0.8 percent (PEACE 2007)]. The pastures around are all divided between herder households, regulated internally and defended from encroachment (Jackson & Wangchuk 2004; Namgail *et al.* 2007b). The other interesting fact is that the remaining *c.* 60 percent of the NP lies above 5,200 m and has limited value for most biodiversity as well as for people. The areas just outside the NP, in the rest of Ladakh, are all divided in a similar fashion among *Gompas* (monasteries), communities and small bits of revenue land (PEACE 2007). There are very few industries in the region and some employment comes from the army (very recent), in contractual jobs, as labourers and from tourism (Chaudhuri 2000; PEACE 2007). Most of these jobs have come about in the past five decades, are seasonal and may not provide a regular source of income. The options for the herders and villagers of the Hemis NP to thus move out of their traditional area are extremely limited, in spite of their apparently low numbers. All through the region, similar issues make relocation of people untenable. The more important question, however, is whether it is really needed.

In the above example we have noted that over half of the PA is in areas above the 5,200 m elevation cut-off for flora and fauna. In the remnant area we have pockets of good wildlife and pervasive human use. Interestingly, observations show that the biodiversity rich areas and habitations are very closely interspersed (Jackson & Wangchuk 2001; *pers. observ.*). For instance, even though there may be some negative consequences of local resource utilisation, it has still allowed a small population of the Tibetan argali to colonise and persist in the NP (Fox *et al.* 1991; Namgail *et al.* 2007a); and it also maintains probably the highest known density of the snow leopard in the country at 8.49 ± 0.22 (Standard Error) (Jackson *et al.* 2006). Such phenomena may well require careful re-examination of a-priori assumptions about the relationship of human use in these high and cold desert landscapes, and wildlife. What this suggests is that if the *status quo* is maintained in the NP in terms of habitations, effective conservation planning with the inhabitants can still benefit conservation goals. This has been demonstrated by the fact that the community voluntarily agreed to regulate livestock pressures in the areas used by the small Tibetian argali population in the NP. This is a process that was catalysed by a non-governmental organisation (NGO), the Snow Leopard Conservancy-India, that has been able to provide tangible benefits to the community linked with community-based tourism (e.g., homestays), conflict management (e.g., improved corrals) and awareness programmes, and the positive efforts of the local wildlife department. In a recent meeting to facilitate discussions about settlement of rights in the PAs of Ladakh, where the community leaders [from village councils and the Ladakh Autonomous Hill Development Council (LAHDC)] were present along with government officials and NGO representatives, on being explained the above concept, the community leaders voluntarily agreed to set aside seven side valleys that they considered to be good for wildlife should that be needed for the NP. For these areas the villagers were willing to re-negotiate their rights and concessions if access to the rest of the NP was not denied to them (Kothari & Padmanabhan 2008). We thus have the possibility of several small 'cores' enclosed in a larger PA, where both villagers and wildlife can persist (but where active management will be necessary for issues such as conflict management).

As mentioned above, we have demonstrated that it is possible to sit at the level of villages or village clusters to discuss and implement joint conservation programmes. This is an effort that will require partnership between local communities, civil society organisations and the government implementing agencies. Some steps towards this have already been made at the local and national level policy initiatives for the landscape under discussion. At the national level, the Ministry of Environment and Forests (MoEF), Government of India, has completed plans for implementing a programme for landscape level conservation of the high altitudes under the Project Snow Leopard (PSL) that involves participatory planning and implementation of conservation programmes in manageable cores in a larger landscape. The salient features of this programme include careful identification of landscapes and the 'cores' (not necessarily PAs), and implementing multi-level management plans that are prepared with community participation. Governments of the Himalayan states are proactively working on streamlining conservation efforts that do not require relocation. At this stage it will be interesting to contrast this approach with another flagship species programme of the government — the Project Tiger. In this latter programme, the primary approach was to conserve through large, exclusionist reserves where areas were meant to be devoid of any human use. While this approach did aid in stopping the tremendous decline in tiger population in the 1970s and 1980s, its success was probably reversed in the last decade due to a number of factors. One among the variety of reasons for this, that the Tiger Task Force constituted by the MoEF believes, is that relocation doesn't seem to have helped conservation, but it did result in the alienation of local villagers and herders who often turned against the PA and may have also helped illegal activities such as poaching and mining (MoEF 2005). I believe that if these exclusionist policies did not succeed in resource rich productive systems, their success in remote resource poor tracts will be even more uncertain. I thus feel that the present initiative of the MoEF to design and conserve areas under the inclusive strategy of the PSL is a very welcome move.

Other local examples are: the LAHDC effort to settle rights of people in the three large PAs of Ladakh without any relocation but negotiation and local engagements (Kothari & Padmanabhan 2008); and Himachal Pradesh where the state government has designated the entire 12,000 sq km Spiti landscape as a 'wildlife division' that includes two PAs, the Kibber WLS (1,400 sq km) and the Pin Valley NP (675 sq km), and that will have an integrated management plan for the entire landscape with specific plans for individual core areas (Vinay Tandon, Chief Wildlife Warden, Himachal Pradesh, *pers. comm.*). Both these, along with the PSL are novel initiatives and may pave the way for participatory conservation in the high Himalayan tracts of India.

The Indian high altitudes have pervasive wildlife and human use and people here have few current options for alternative livelihoods. While regulating human use can certainly help wildlife in some places, more drastic actions such as using relocation to make areas free of human pressures need not be used. Alternative approaches that deal with identifying smaller reserves and managing it with local support appear to be a much more justifiable option for the region. In his classical study on mountain wildlife, *Mountain monarchs*, George Schaller (1977: 336–337) had ended on a pessimistic note 'As we reach for the stars, we neglect the flowers at our feet. But the great age of mammals in the Himalayas need not be over unless we permit it to be. For epochs to come the peaks will still pierce the lonely vistas, but when the last snow leopard has stalked among the crags and the last markhor has stood on a promontory, his ruff waving in the breeze, a spark of life will have gone turning the mountains into stones of silence'. Schaller's pessimism probably arose due to his study areas in Pakistan and Nepal where hunting is rampant, but the future of wildlife in the Indian mountains is certainly more secure, especially with the innovative inclusive approaches now being devised.

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