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Shafqat Hussain

Protecting the Snow Leopard and Enhancing Farmers' Livelihoods

A Pilot Insurance Scheme in Baltistan

Snow leopards that prey on poor farmers' livestock pose a twofold problem: they endanger farmers' precarious mountain livelihoods as well as the survival of the snow leopard as a unique species since farmers engage in retaliatory killings. Project Snow Leopard (PSL), a recent pilot initiative in Baltistan, involves a partnership between local farmers and private enterprise in the form of an insurance scheme combined with ecotourism activities. Farmers jointly finance the insurance scheme through the payment of premiums per head of livestock they own, while the remaining funds are provided by profits from trekking expeditions focusing on the snow leopard. The insurance scheme is jointly managed by a village management committee and PSL staff. The scheme is structured in such a way that villagers monitor each other and have incentives to avoid cheating the system.



FIGURE 1 High pasture with shepherds' huts in Skoyo Valley, Baltistan. (Photo by Shafqat Hussain)

A double challenge

The snow leopard, *Uncia uncia,* is widely but thinly distributed throughout the Central Asian mountains. Globally, the species is declining to a minimum viable population and is threatened by extinction: the 1996 IUCN *Red List of Threatened Animals* lists it as endangered. It is estimated that, of the worldwide population, only 3000–7000 animals live in the wild; these are threatened, among other things, by local farmers' retaliatory killings of snow leopards that attack domestic livestock.

Throughout the snow leopard's habitat, protection of the species tends to conflict with the safeguarding and enhancement of mountain farmers' precarious livelihoods (Figure 1). Research has shown, for example, that snow leopards come under frequent persecution in the Annapurna Conservation Area in Nepal and in the Indian Himalayan regions. Some governments have taken steps to resolve the conflict by initiating state-sponsored compensation schemes. While several authors have acknowledged the importance of compensation schemes in achieving the double aim of alleviating farmers' economic hardships and conserving the snow leopard, they underline that, in most cases, the schemes have failed, apparently for lack of an effective mechanism to prevent farmers from cheating. They suggest that this problem could best be tackled through community participation and a development approach that integrates local institutions in the management and operation of such schemes.

In an effort to understand the specific nature of the problem in Pakistan and

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to work toward a solution that could be applied in other countries as well, the author conducted initial investigations into the problem during field visits to the Northern Areas of Pakistan in the summers of 1998 and 1999. The field research included the setting up of an innovative initiative, Project Snow Leopard, in the village of Skoyo in Baltistan (Figure 2). This project relies on a community-run insurance scheme and a private trekking company.

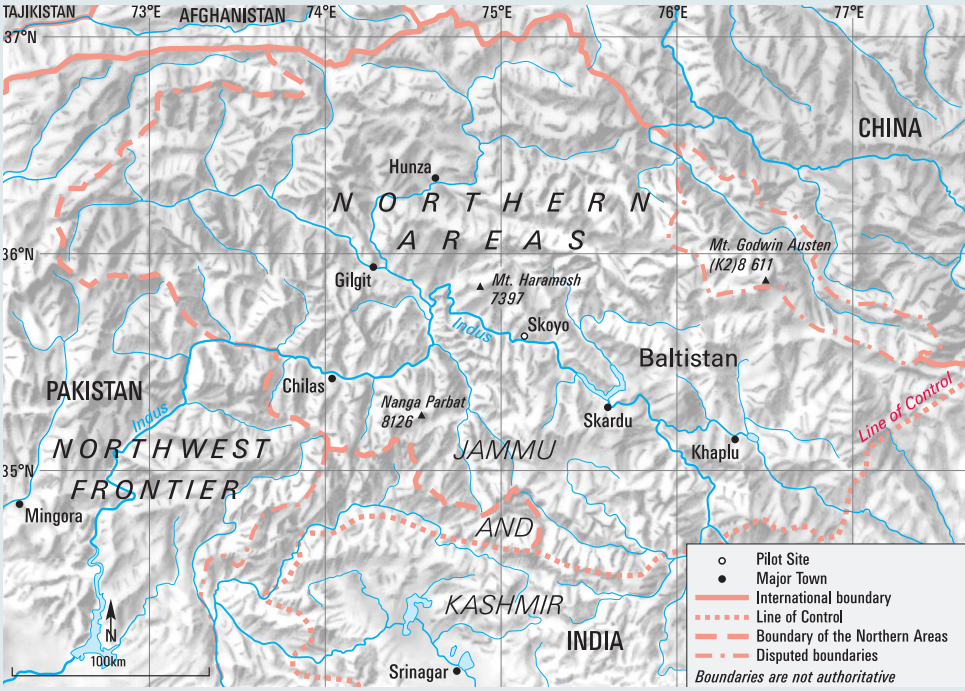
A rare species in a poor high mountain area

Very little research has been done on the snow leopard in Pakistan. According to the most recent estimate by George Schaller (in 1977!), the number of snow leopards in this country is as low as 200. Of this population, 90% is thought to live in the Northern Areas (NAs). As in most Central Asian mountain areas, retaliatory killings by local farmers constitute a major threat to the survival of the species in the region.

Conserving the species in the Northern Areas is particularly problematic given the high number of people whose livelihoods depend on rural resources. The 1980 Census of Agriculture for the Northern Areas counted some 68,215 farms in the region and a total farmed area of 69,510 ha. The average farm size in the Northern Areas is thus relatively small, that is, 1.01 ha of land, of which an average of 0.72 ha are cultivated. Only 3% of the farms have landholdings ranging between 3 and 5 ha, while a mere 1% have more than 5 ha. Traditionally, livestock rearing has been more important than farming, with high pastures playing a central role in resource-use patterns (Figure 1). On the whole, local farmers in this part of Pakistan are extremely poor, with an average per capita income per year of only US$300.

While 60% of the population in the Northern Areas depend on rural resources (Figure 3), in Baltistan, this percentage is much higher; 95% of the local population are agropastoralists. Livestock represents a very significant source of income as well as an asset on which farmers can rely in times of unexpected temporary or permanent hardship.

FIGURE 2 The Northern Areas with Baltistan and the village of Skoyo, where PSL was initiated in 1999. (Map by Andreas Brodbeck)

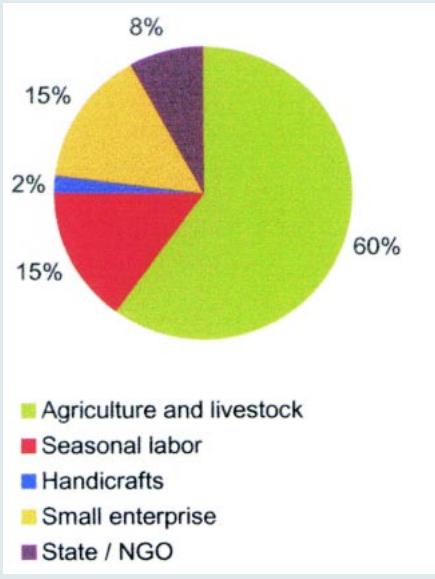


Retaliatory killings in the NAs

In the Northern Areas, snow leopards are mostly killed in the winter when they approach human settlements in search of natural prey or farmers' livestock. Hungry snow leopards have been known to jump inside a barn or a corral and remain trapped. Once inside, they may panic and engage in mass killings, thus inflicting heavy losses on the owner of the livestock. While poison is often used to kill animals of prey, especially wolves, it is not known how effective this method is when used against snow leopards. Nor is it known how many snow leopards are killed each year by other means. There is a heavy government penalty for killing snow leopards; farmers are therefore reluctant to tell outsiders about killings.

In the past 3 years, snow leopards trapped inside a livestock corral have been caught alive at least four times in the Northern Areas. In all four cases, the farmers informed the local conservation nongovernmental organizations (NGOs) and the government administration, who helped release the leopards in the wild.

FIGURE 3 Means of livelihood in Pakistan's Northern Areas. The percentage of the rural population in the region of Baltistan is much higher: 95% depends on agriculture and livestock. (Source: Mountain Area Conservancy Project Proposal, Government of Pakistan, and UNDP)



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FIGURE 4 Ideal snow leopard habitat in Baltistan. (Photo by Shafqat Hussain)



FIGURE 5 An adult female snow leopard in Chitral, North West Frontier, Pakistan. (Photo by Kushal Habibi)

On the basis of interviews conducted in the study area, it can be argued that, during the same period, there were at least as many cases in which a snow leopard was killed. Although this number is low, it constitutes a significant threat to the survival of the species.

Economic evaluation of risk factors

At first glance, releasing snow leopards and thus perpetuating a serious threat to their livelihoods seems to be an irrational form of behavior on the part of farmers. But certain communities have understood that they could benefit from protecting the snow leopard rather than killing it. They appeal to local conservation NGOs to support them in their conservation attempts. The preferred form of support is compensation for the loss of livestock to snow leopards and for the concurrent loss of assets that provide a livelihood in times of hardship. Where compensation schemes are not known or do not work well, retaliatory killing of a snow leopard is a rational choice. It is understandable that local farmers are unwilling to subsidize the survival of a rare species that constitutes a threat to their livelihood.

The loss of livestock to snow leopards is a random risk: a snow leopard does not choose the owner of the animals it kills. Therefore, over the years, the probability of being hit by such a loss is randomly but evenly distributed among the farmers. This is an argument in favor of collective coverage of farmers' individual risk. In its attempt to evaluate the risk factor and design a viable solution, PSL therefore suggested that farmers could set aside a collective pool of money equal to the value of the average annual loss rate. This would allow the community to spread the risk and reduce the impact of losses. The loss of livestock would then be a mild setback for the entire community rather than a severe blow suffered by one individual.

Project Snow Leopard

Project Snow Leopard (PSL) was initiated in 1998 to meet the dual challenge of alleviating farmers' losses and conserving the snow leopard population in Baltistan. PSL has two basic components: a collective insurance fund and the promotion of ecotourism activities focusing on the snow leopard. The former consists of premium contributions paid in by farmers per head of livestock. The latter generates income for a second fund that cofinances insurance compensation if losses incurred are higher than expected.

Conceptually, the two components fit together well and provide farmers with a good reason for not hunting predatory snow leopards. On its own, the insurance scheme would not be a viable strategy for the conservation of the snow leopard. Indeed, when farmers make premium payments to take out livestock insurance, they cover the risk of a loss; but this hardly motivates them to conserve the snow leopard as a species. Also, taking out insurance implies paying yearly premiums—a regular cost farmers would prefer not to incur–and the loss of a goat or cow can be more than an economic loss. Under such conditions, retaliatory killings are more than likely. Even with complete insurance coverage for livestock losses, snow leopards may still be perceived as a nuisance that farmers will want to eliminate whenever possible. By promoting ecotourism activities, PSL not only secures the financial means that help cover the true costs of losses. The focus of activities on the snow leopard ensures that farmers have a strong interest in the survival of the species and in safeguarding an important source of income from related tourism.

At present, PSL is being implemented on a pilot basis in the village of Skoyo in Baltistan, located on the Indus approximately 60 km west of Skardu, the regional capital (Figure 2). Skoyo consists of 24 households with a total population of about 260 people; 90% of the 170 km^2 belonging to Skoyo is ideal snow leopard habitat (Figure 4). It was selected as a pilot site because snow leopard attacks on domestic livestock were regularly recorded over a period of 5 years prior to the launching of the initiative. IUCN surveys in the area confirmed that the snow leopard is the only wild predator in and around the village (Figure 5). Another reason for selecting this community was

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that the villagers expressed their hope of finding a sustainable solution.

Evaluation of livestock losses and design of the insurance scheme

Data on livestock losses due to predation were collected in Skoyo over a period of 5 years, revealing that 55 animals (50 goats and 5 cows) were killed during this period—an average of 11 animals per year, representing about 2% of the village's total livestock holdings (approximately 600 head). This loss rate is very similar to loss rates in other parts of the Northern Areas and in other Central Asian countries. Since most of the animals killed by snow leopards were goats, the villagers decided to insure only goats during the pilot stage of the project.

Under the insurance scheme, all households in Skoyo village have now taken out insurance on their goats. The premium rate has been set at 1% of a goat's current value. Indeed, given that the average annual loss in the past 5 years has been 2% of the total value of herds and that this percentage is expected to remain constant in the coming years, the villagers' own premium payments should cover at least 50% of the costs of the average annual loss. The other 50% will be covered by the ecotourism fund.

Insurance premiums are paid annually by the villagers into Fund1, which is kept in an account at a local bank. The money is held collectively, but individuals' payment records are kept separately in the village. PSL has calculated that the average value per goat is 1500 Pakistani rupees (PKR). (At the time the scheme was set up, the exchange rate was PKR54.00 to US$1.00.) At a rate of 1%, premiums have therefore been set at PKR15 per goat. The second fund, or Fund2, is used to help cover the rest of the costs of livestock losses; it is fed by proceeds from ecotourism activities run by a local trekking company, Full Moon Night Trekking (FMNT). Fund2 is kept in a separate account at the local bank. Tables 1 and 2 illustrate this financial scheme. The model assumes that the rate of loss will remain at 2% and the income from ecotourism will be generated without interruption.

PSL and the members of the Skoyo community collaborate with FMNT (Figure 6). The company generates income by selling trekking packages, one of which is a snow leopard trek. While FMNT works as a commercial tour operator in the area and is profit-oriented, it invests most of its prof-

TABLE 1 Data for the insurance scheme.

Number of households	26[a]
Average size of goat herd	25 head
Premium per goat	PKR15
Average value of a goat	PKR1500
Total value of goat population	PKR975,000
Expected losses to snow leopards	2%
Value of claims to be settled	PKR19,500

[a] In 1999, Skoyo had 24 households, but 26 members took out insurance. Usually, 2 or 3 families live in the same house. The entire extended family is defined as one household. But in some cases, individual families within a household make separate budgets. This was the case for 2 different households in 1999.

TABLE 2 Budget for the insurance scheme.

Projected revenue/ expenditures (in Pakistani rupees)	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Opening balance of the two funds	—	30,250	63,525	100,127	140,390	184,679
Premiums (Fund1)	9750	9750	9750	9750	9750	9750
Other income (Fund2)	40,000	40,000	40,000	40,000	40,000	40,000
Interest on assets	—	3025	6352	10,012	14,039	18,468
Total revenues	49,750	83,025	119,627	159,890	204,179	252,897
Expenditures: claims	19,500	19,500	19,500	19,500	19,500	19,500
Closing balance at the end of the year	30,250	63,525	100,127	140,390	184,679	233,397

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FIGURE 6 Skoyo community members and the project manager (and author) discuss the insurance scheme. (Photo by Ghulam Mohammad)



FIGURE 8 Surveying snow leopard habitat in Chunsa Valley, Baltistan. (Photo by Shafqat Hussain)

its in conservation and development projects, of which PSL is the most important at present. Successful marketing of the snow leopard trek raised PKR40,000 for Fund2 in 1999. For the 2000 season, three groups of tourists have booked the company's snow leopard trek—a significant increase compared with the previous year.

Filing of claims and compensation scheme

The insurance scheme is meant to be largely self-sustaining and locally managed. A Village Insurance Committee (VIC) has been set up for this purpose. The members of the Committee are from Skoyo village and have been nominated by the villagers. Claimants must formally file applications with the VIC, which verifies the killings and makes recommendations. If the VIC recommends that a claimant be compensated, the following steps are taken:

1. The claimant receives his/her individual accumulated premium amount from Fund1 as compensation.
2. If the claimant's accumulated premium amount in Fund1 is not high enough to cover the full value of the loss incurred, money is taken from Fund2 to cover the remaining costs (see Figure 7).

For example, a farmer has 30 goats. In the first year, he pays 30 × PKR15 = PKR450 into Fund1. The same year, a snow leopard kills two of his goats, the value of which is 2 × PKR1500 = PKR3000. The VIC verifies that the goats were killed by a snow leopard and approves the claim for compensation. To pay the amount agreed on, the VIC uses the total premium amount paid by the farmer into Fund1 (ie, PKR450). The remaining amount, PKR2550, comes out of Fund2.

The VIC is the signatory on checks written from Fund1. For Fund2, the VIC and PSL's manager are cosignatories. Premiums are paid annually. The members of the insurance scheme are entitled to interest earned on the total amount, which is paid out annually to them in proportion to their individual accumulated premium amounts. Entitlement to money from Fund2 is restricted to those members of the community who have paid premiums into Fund1. In the case used as an example, the farmer exhausts his premiums paid into Fund1 by receiving compensation. He must therefore make sure that he pays in the premiums on the remaining 28 goats to insure them for the next year. In such a case, the premium rate for this second payment may be higher as a result of his having received compensation the first year.

Advantages of the insurance scheme

One major advantage of this two-tier financial scheme is that, unless the entire village colludes and decides to cheat, it is very difficult to abuse the scheme. Indeed, the villagers treat Fund2 as their collective pool of money generated from "their" common resource—the snow leopard. Villagers have a strong incentive to let Fund2 grow beyond a viable threshold that will allow surplus funds to be paid out in case of need. This threshold has been set at PKR100,000, a sum PSL hopes to accumulate by the end of the third year of its

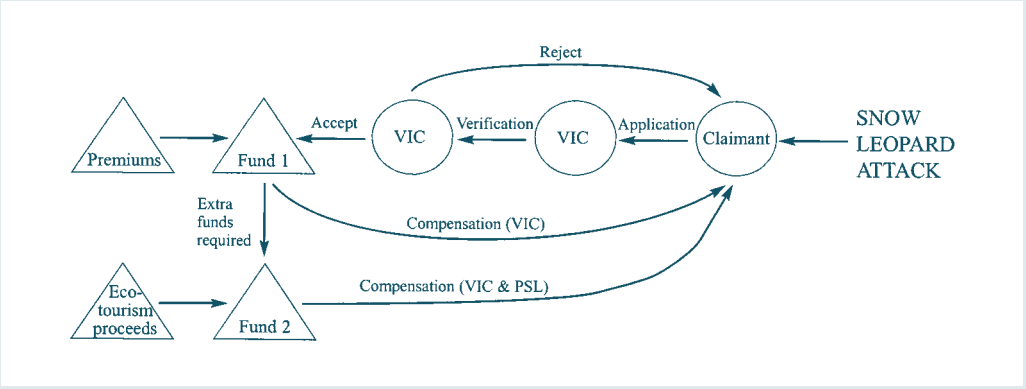


FIGURE 7 The pilot insurance scheme: steps involved in the claiming and compensation procedure. VIC: Village Insurance Committee; PSL: Project Snow Leopard.

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operations (ie, in 2001). With this maximum amount, Fund2 can theoretically pay out compensations for the following 6 years, provided the loss rate does not exceed 2% per year and the value of goats does not rise as a result of inflation. Surplus income will be distributed equally among all members. This should constitute a collective disincentive to unnecessarily drain Fund2 and should ensure that only genuine cases will be filed by claimants and approved by the VIC.

The future

One claim was filed in the first year of the Project, 1999. It was approved and compensation was paid out. All the steps of the prescribed procedure were followed correctly, and local people actively participated in the verification process.

Project Snow Leopard provides an example of how poor mountain farming communities can overcome some of their individual problems through collective action and decision making. The project also demonstrates that conserving biodiversity can be a profitable economic, social, and cultural solution for local communities in partnership with the private sector. Indeed, the insurance scheme is not the only component of Project Snow Leopard, which also includes biological surveys to update knowledge on snow leopards in Baltistan (Figure 8) and the commissioning, performing, and broadcasting of a local play to raise awareness among the population.

Poor farmers throughout the world are often blamed for applying practices that degrade natural resources. But they exhibit rational behavior and engage in rational activities, just as more affluent people do. However, individual action often results in everyone in a community being worse off than if collective action had been taken. PSL's insurance scheme demonstrates that an appropriate incentive structure is essential for collective action and offers an example of how such a structure can be put in place. PSL also demonstrates the importance of establishing an effective monitoring and maintenance mechanism.

The principle of client-funded insurance rather than external compensation and the link with ecotourism activities are a means of ensuring that PSL will be free of dependence on donors. However, there is a risk associated with the independent nature of the project: it is dependent on the fluctuating market for tourism. Real or perceived security risks arising from economic and political instability could reduce the flow of tourists to Pakistan, thus making the insurance scheme more vulnerable to financial crises.

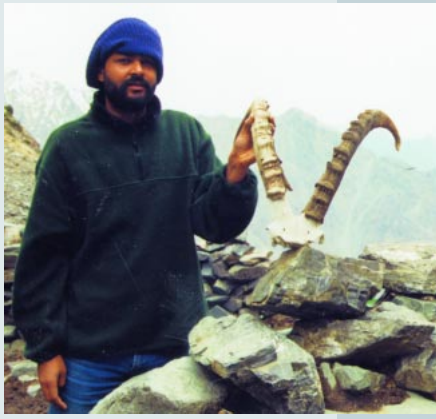


FIGURE 9 The author with the remains of a Himalayan Ibex probably killed by a snow leopard. The Ibex is part of the snow leopard's staple diet. (Photo by Jozee Hussain)

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To find out more about snow leopard trekking and PSL, visit www.fmntrekking.com. The International Snow Leopard Trust (see snowleopard.org) also runs a Project Snow Leopard, which is not to be confused with the project presented here. Ed.

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