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Chandra Singh Negi

Declining Transhumance and Subtle Changes in Livelihood Patterns and Biodiversity in the Kumaon Himalaya

*Trade with Tibet and the factors associated with its maintenance (agriculture and livestock) were the prime occupation of Johaaris and Darmis tribesmen until 1962, when the Sino–Indian war brought an immediate end to this thriving lifeline. The loss of trade brought about drastic changes in the transhumant lifestyle—fewer households arriving at their summer homes, a smaller livestock population, disappearance of traditional handicrafts, and increased exploitation of wild medicinal and aromatic plants (MAPs), with traditional crops being replaced by more remunerative crops such as chives (*Allium stracheyii*) and caraway (*Carum carvi*) as the chief source of livelihood. The present study highlights the causal factors behind changes in the lifestyles of these traditional people in Uttarakhand, India, and the concomitant changes in crop biodiversity and MAPs in the region. It concludes with proposals for possible alternatives for a sustainable future for these people.*

The Bhotiyas: transhumant agropastoralists and nomadic shepherds

Bounded by the Kali and Dhauli rivers, in the northern half of the Pithoragarh District in the state of Uttarakhand, the Darma, Vyas, and Johaar valleys are inhabited by a tribal society known as Bhotiyas (Figure 1). The present study is confined to the Darma valley, which consists of 12 villages scattered between altitudes of 2250 and 4350 m, with a total population of 1000, and the (upper) Johaar valley in the Gori river basin, consisting of 13 villages with a total population of 494, all of which are situated in the sub-alpine and alpine zones above 3000 m.

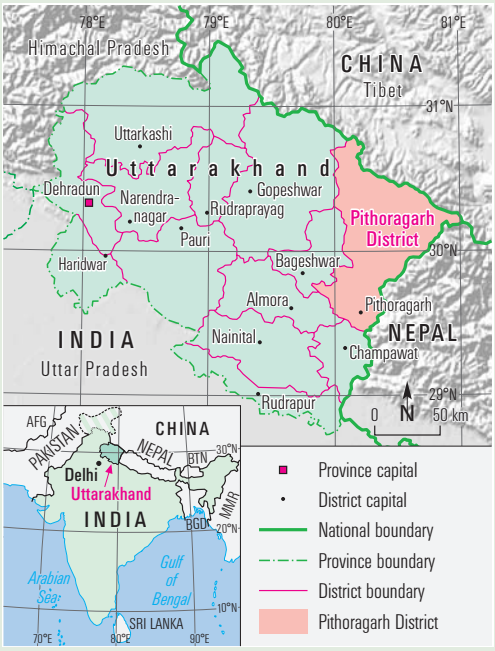

FIGURE 1 Location of Pithoragarh district in the new state of Uttarakhand (formerly Uttaranchal), India. (Map by Andreas Brodbeck)

The people lead a seasonal transhumant life, although a smaller number of *anwals* (shepherds) lead a completely nomadic existence. Upward migration (from mid-April to May) to summer habitations is governed by the need to arrive in time to sow crops and make use of the rather short growing season, with harvesting done by the end of September. This is also the period for harvesting medicinal plants, mainly *kutki* (*Picrorrhiza scrophulariflora*), before returning to winter homes in the first half of October.

The decline of transhumance and pastoral nomadism

By adopting the practice of transhumance, which enabled them to gather rare Himalayan herbs and utilize agricultural land in summer villages to raise specialized crops such as buckwheat (*Fagopyrum esculentum*), sweet buckwheat (*F. tataricum*), and barley, and to a lesser extent potato and other vegetables, the Bhotiyas acquired the capacity to utilize resources, accumulate goods, and improve their economic standing. Traditional crop varieties and races acclimatized to high-altitude climatic regimes not only met the nutritional and food security of these communities but, more importantly, were a major commodity that was traded with Tibet. Pastoral nomadism allowed *anwals* (Figure 2) to utilize marginal resources—alpine pastures/meadows unsuitable for other uses—and thus maintain a breed of sheep and goats that was much larger and more productive than those raised by sedentary peasants.

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However, in the last 2 decades, a marked decline in transhumance and customary lifestyle has been observed, resulting from the severance of trade with Tibet and secondarily from the lure of government services in the form of provision of reservations, an outcome of the scheduled tribe status granted to these people. Thus, in 1961 the total number of migratory households was 1475; this has now been reduced to just 61, an incredible decline of 96% in the Johaar valley.

Disruption of trade

The Bhotiya traders zealously guarded their trade routes and maintained a monopoly over the trans-Himalayan trade with Tibet. As sheep and goats transported merchandise, large flocks and herds were needed. Following the Sino–Indian war in 1962, the Indo–Tibetan border was closed, which led to the instant termination of this flourishing commerce, marooning two-thirds of the population, who lived almost exclusively on income from trade. Concomitantly, the transhumant lifestyle of raising sheep and goats as pack animals and family movement from winter village to summer village, determined principally by the need to maintain trade relations, also dwindled with time.

The disruption of trade also had an adverse effect on several other professions intricately linked to trade: cultivation of crops, sheep rearing, the wool industry, and occupations that helped maintain the community at a subsistence level. It also led to the demise of freight shepherds. The Bhotiyas used to produce a variety of woolen products (Figure 3), mostly for sale, as long as Tibetan wool was imported, in addition to the wool locally available from one's own flock of sheep. After the closure of the border, traditional handicrafts suffered and the community was forced to seek alternative livelihoods.

Evidence of current trends

The present study was carried out to ascertain the radical changes in transhumance patterns, livelihoods, the extent of cultivation of MAPs, and exploitation of the diversity of wild plants and crops in the 2 valleys after 1962.

FIGURE 2 An *anwal* with his prized possession—a flock of livestock, the numbers of which are presently dwindling. (Photo by C. S. Negi)

Dwindling livestock populations and the traditional art of weaving

The very livelihood of these people is intricately woven around the number and health of livestock, which provide wool and thus clothing, are the only means of transportation, and, to a lesser extent, play a significant role in nutrient cycling.

FIGURE 3 The traditional art of weaving is no longer a profitable source of income, but it is being kept alive nevertheless. (Photo by C. S. Negi)

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FIGURE 4 Village ruins provide secure sites for the cultivation of *Carum carvi*, *Allium stracheyii*, and a few other medicinal plants. (Photo by C. S. Negi)

While the decline in the cattle population is not too perceptible, a drastic decline in the sheep population has taken place, with a consequent effect on the traditional art of weaving, as it has become very difficult to procure even small amounts of raw wool. The total sheep population has dwindled from 15,949 in 1987 to a mere 2813 at present, a decline of 82%. The present size of sheep herds (average 50–100 per family) is no longer remunerative, and sheep exist more as "an excuse to lead the lifestyle we are accustomed to" and "to enjoy the bliss of alpine meadows," as some local people have expressed it.

Decline of agriculture and change of cropping systems

According to land records held by Patwari, 0.11% (or about 1.31 km^2) of the landscape consists of cultivable agricultural land, of which around 16% (or about 20.81 ha) is devoted to crops. Even though per capita land availability of 0.27 ha is higher than in the rest of the state, per capita land under cultivation is a mere 0.04 ha. Agriculture is practiced more for cash cropping than to meet subsistence food requirements, where monocropping is the norm.

Currently, there are 3 basic types of agricultural fields: 1) traditional fields reduced in size, poor in organic matter, and without irrigation; 2) vegetable gardens, often localized within or near the home, and rich in organic matter; and 3) fields within the village ruins (the characteristic feature in the Johaar valley) with *Carum carvi* and *Allium stracheyii* being grown within the safety of the crumbled walls (Figure 4). Nutrient enhancement is effected primarily through application of composted manure (*phichi ghaas* or *Poa alpinia* mixed with livestock manure) and application of crop residue, such as caraway stalks spread on the fields and left to decompose.

In the Johaar valley, durum wheat (*Triticum* sp.), paddy (*Oryza sativa*), potato (*Solanum tuberosum*), millet (*Eleusine coracana*), sorghum (*Sorghum vulgare*), amaranth (*Amaranthus frumentosa*), buckwheat (*Fagopyrum* spp.), broad beans (*Vicia faba*), and kidney beans (*Phaseolus vulgaris*), among others, were cultivated, indicating the diversity of crops. People used to arrive very early at their summer homes (March vs end of May at present), with the return journey towards late October—the duration required for crop cultivation. The termination of trade ties has caused a loss of crop diversity. Today, cereals and pulses are virtually absent in the Johaar valley, while in Darma, a single cereal species, *Fagopyrum esculentum* or *F. tataricum*, is being grown (Figure 5). Prior to 1962, durum wheat was produced on a mass scale and used as *sattu* (a type of flour) for trade with the Tibetans. Similarly, potato is not profitable for markets near home (exorbitant freight charges), and hence little, if any, acreage is devoted to this once profitable crop. With this changed scenario, chives (*Allium stracheyii*), which sell for 150–200 Rs/kg (1 US$ = 45 rupees) and caraway (*Carum carvi*), which sells for 250 Rs/kg, are the 2 principal remunerative crops grown. The Johaar valley alone yields around 1100 kg of caraway seeds annually, contributing as much as 176,000 Rs to the valley in terms of agricultural income.

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Cultivation of MAPs as an alternative strategy

The upper Johaar valley has often been cited in recent literature as a place where much cultivation of MAPs is taking place. In fact, only 0.18 ha, or 0.85% of the total cultivated land in the entire upper Johaar valley, is actually under cultivation with MAPs, generating a total income of merely 9000 Rs. By contrast, 980,000 Rs were earned through the sale of wild MAPs, primarily *yar tsa gumba* (caterpillar mushroom or *Cordyceps sinensis*), whose current market price hovers at about 80–90,000 Rs. This income from wild MAPs amounts to more than half of the total earnings from agriculture, livestock, and cultivation of spices and MAPs combined.

Obviously, the few MAPs grown in home gardens are a cover for what is actually being done in the name of cultivation, ie reckless harvesting from the wild, which has led to the depletion of important species in the area. Collectors in the Johaar valley reported that until 5 years ago, they were able to collect about 200 g of dry *atis* (*Aconitum heterophyllum*) per day; this has dwindled to 70–100 g per day. There are a number of reasons for this overexploitation: both collectors and contractors are primarily interested in higher, short-term income and have little concern for sustainability; moreover, since collectors are paid according to volume, their prime concern is to harvest as much as they can in the limited time available to them; finally, a sound mechanism regulating the ownership of resources is lacking. This is a prima facie example of the 'tragedy of the commons.'

Difficulties in cultivating MAPs

Nevertheless, notice must be taken of the people's expertise in successfully regenerating medicinal herbs such as *kutki* (*Picrorrhiza scrophulariflora*; Figure 6), *chippi* (*Angelica glauca*), *ban kakri* (*Podophyllum hexandrum*), *kuth* (*Saussurea costus*), *dolu* (*Rheum australe*), and *atis* (*Aconitum heterophyllum*). The principal factors behind low interest in the cultivation of MAPs at present are: 1) high risk involved in the cultivation of medicinal plants; 2) a long growing period, often 3 years or more; 3) frequent low yields; 4) a lack of financial and technological support in terms of harvesting, storage, transportation, and quality improvement; 5) lack of financial support to construct fences to protect the crop from wild animals, irrigation, etc; 6) lack of institutional support and complete absence of buy-back arrangements; 7) a wide gulf between the prices of cultivated MAPs and those of MAPs collected from the wild, with the traders preferring the wild harvested MAPs; and 8) poachers, who arrive when migrants have returned to their winter homes, usually harvesting the cultivated MAPs. All these factors have contributed to mass exploitation of MAPs in the wild.

Meanwhile, cyclical harvesting from the wild, protecting some patches from harvesting for a period of 2–3 years, would go a long way towards conservation of the MAPs. This is being practiced by the *van panchayat* (village forest council) in the village of Ralam, which has demarcated its entire *van panchayat* forest into 7 different zones, each harvested only once at intervals of 3 years. This not only lessens the pressure on wild species of MAPs, but also allows the plants to grow to maturity, since most of the selected MAPs require at the most 3 years to mature. The harvest cycle

FIGURE 5 *Palthi* (*Fagopyrum esculentum*), cultivated extensively in the Darma valley. The same crop is completely absent from the Johaar valley, having been replaced by the more remunerative *thoya* (*Carum carvi*) and *jambu* (*Allium stracheyii*). (Photo by C. S. Negi)

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FIGURE 6 The most heavily exploited medicinal plant species, *kutki* (*Picrorrhiza scrophulariflora*). (Photo by C. S. Negi)

is governed strictly by the village forest council, and trespassers are strictly reprimanded. It is important to take note of the fact that in this village, all 42 households are engaged in the collection of wild MAPs, which contributes as much as 78% to total household income.

Involving people in policy-making

Development policies thus far have not taken account of the socio-cultural, ecological, and economic value of transhumance and nomadic pastoralism. Rural economies, especially those of transhumant people, are not monetary economies. Bereft of a means of livelihood, these people engage largely in collecting MAPs from the wild as a form of subsistence.

Subsidies of 40–50% of cultivation and infrastructure costs have been envisioned to be provided by the National Medicinal Plants Board, New Delhi, and the state Herbal Research and Development Institute, Gopeshwar (Uttarakhand), on an equal basis, to farmers interested in the cultivation of MAPs. However, there is a clause stating that to benefit from the subsidy, a minimum of 20% of the cost of cultivation must be procured from a bank. In view of the terrain and the remoteness of these villages, banks are reluctant to provide such loans.

Similarly, buy-back arrangements with the aid of government agencies, such as forest corporations acting as mediators, have been elaborated. However, these policy initiatives have failed to percolate to the grassroots level, and farmers are completely oblivious of them. It is vital that policy-makers and the enforcing agencies meet with the farmers, physically analyze the genuine problems they face, and evolve sound and practical strategies.

Rather than granting loans and subsidies for the cultivation of MAPs per se, they should extend infrastructural support, ie provide irrigation facilities, barbed fencing or walls to ward off foraging wild animals, and provide a minimum wage to 1 or 2 individuals as an incentive to stay in their summer homes a bit longer to protect their cultivated MAPs. Backed up by sound buy-back arrangements, these steps would be far more effective than simply providing financial inputs.

Since today collection of MAPs from the wild remains the primary mode of sustenance, local people simply cannot be excluded from procuring what rightfully belongs to them. Thus, government policies must be pro-poor in approach and deed. The human aspects of the environment need to be dealt with earnestly before we can speak of conservation in a wider sense.

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Chandra Negi is a lecturer at the Department of Zoology in Pithoragarh. His fields of interest include the study of traditional knowledge-based belief systems surrounding sacred groves and forests and their role in the conservation of wild flora and fauna; biodiversity (principally high-altitude medicinal and aromatic plants) and sustainable mountain development; studies on inter-relationships between cultural diversity and biodiversity; ecology; and environmental science.

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