

HIMALAYAN HERDING IS ALIVE AND WELL: THE ECONOMICS OF PASTORALISM IN THE LANGTANG VALLEY

Colleen McVeigh

Livestock herders have historically played a key role in developing and sustaining the rangeland regions of the Greater Himalayas. Rangelands, which cover approximately one-third of the Himalayan land area, are concentrated in the higher elevation regions above 3000 m where grasses and alpine shrubs are the dominant vegetation types¹. Through the pursuit of various forms of nomadic and transhumant pastoralism, including agro-pastoralism, Himalayan herders have transformed these extensive but physically marginal environments into economically productive areas where human populations have lived and even prospered for hundreds, sometimes thousands, of years (see Miller and Bedunah 1993) though exact figures are unavailable, Miller (1995: 2) estimates that as many as ten million people currently reside in and depend on mountain rangelands in the Greater Himalayas.

Yet the value of mountain pastoralism, including the ability of animal herders to sustain the natural environment, is under scrutiny by scientists, natural resource managers and policy makers who neither depend on nor engage in pastoral pursuits, and who do not themselves reside in areas where natural grasslands dominate the physical landscape. Agrawal and Saberwal rightly point out in the introduction to this volume that pastoralism is often portrayed as a thing of the past. The pastoral production system is seen as somehow out of step with the social and economic realities of modern life and pastoralists themselves are depicted as lacking the necessary resources – whether social, economic, or political – to continue their specialised way of life.

In keeping with other scholarly accounts that challenge this description, anthropological research conducted in the Langtang Valley in 1997–1998 showed that the herding system in north-central Nepal is very much alive and well. Rather than being some archaic remnant of the ‘traditional’ (read outdated) economy, pastoral production in Langtang remains critical to the functioning of the contemporary farming system and is considered one of the most important economic activities by Langtang residents themselves. Moreover, ‘Langtang pastoralism’ is very much engaged with the modern market economy and as such it is a key element that allows Langtang residents to remain in the valley and earn a viable living. This fact alone is remarkable and distinguishes Langtang villagers from some other mountain dwellers, who are often forced to pursue external migration in order to survive². The research also showed that Langtang pastoralism plays a vital role in the regional farming system of highland-central Nepal, serving as one of the few yak breeding centres on the southern slopes of the Nepal

Himalaya. This fact alone has serious implications for policy makers, particularly those who may seek to limit pastoralism in the area.

Background

Located some 60 km north of Kathmandu at longitude 85°34' and latitude 28°12', Langtang is an east–west running valley that nestles between two alpine ranges in the Nepal Himalaya. Elevations range widely from 1,300 m at the valley's mouth to over 7,200 m at its highest point, Mt. Langtang-Lirung. The high peaks and ridges of the Langtang Himal, which rise above 6,000 m, constitute the northern divide of the valley and act as a natural border between Nepal and the Tibetan Autonomous Region of China. The southern divide is lower and provides the only way into the valley other than at the western end. At an altitude of 5,122 m, the Gangja La pass serves as a gateway to the Helambu region to the south.

Dubbed the 'Valley of Glaciers' by the Durham University Himalayan Expedition (DUHE)³, Langtang's upper reaches are littered with debris-covered ice tongues, frost-shattered rocks and large, overwhelming moraines, making it a beautiful if somewhat daunting place. The valley's climate is driven by the summer monsoon, which brings 80 percent of the year's moisture in the form of rain on the valley's terraces and plains and snow in the high mountains⁴. The summer rains are vital for crops and grasses during the short, single growing season, but associated erosion patterns also create ideal conditions for landslides and avalanches. These pose real threats to people and livestock alike; in August of 1997, five female yak and eighteen sheep were killed by just one avalanche, striking a serious blow to the household economies involved. Ono and Sadakane (1986) say that avalanches are one reason why the south-facing valley wall is not covered by forest, offering a refreshing alternative to claims that unforested slopes are the result of local misuse.

Humidity and cloud cover increase with the monsoon (Timmerman and Platje 1989), and most afternoons a thick cloud, which is so reliable you can almost set your watch by it, is blown up the valley, shrouding everything in its path in mist.⁵ The cloud cover has the effect of keeping temperatures down in summer while the lack of it allows for more sunshine hours – and thus warmer temperatures – in winter. This means that the settled part of the valley does not normally experience extreme temperatures either way, which is to say it gets neither very hot nor very cold (see Figure 1). Instead of the bitter cold of drier areas, it is the dampness in Langtang that bites.

Langtang is inhabited by a Tibetan-speaking people whose means of subsistence has depended on animal husbandry for at least three hundred years. The earliest settlers came from Kyirong, Tibet, sometime before the mid-1600s, bringing with them their animals, their high-altitude crops and a whole set of values and institutions upon which the valley's culture is founded. Other migrants, including Tamang and Sherpa from neighbouring valleys, eventually joined the

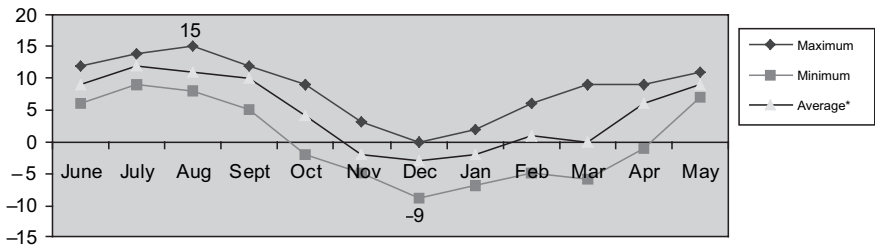


Figure 1: 1997–1998 Monthly Air Temperatures

Data Source: Kyanjin Gomba weather station records, June 1997 to May 1998.

* Average figures have been rounded to the nearest whole number.

original settlers; and Langtang's unique cultural alignment arises from centuries of intermarriage between these people. In 1997–1998, there were 464 permanent residents living in 95 households in Langtang⁶.

In 1976, the Langtang Valley was designated part of the Langtang National Park, at which time Nepal's Department of National Parks and Wildlife Conservation assumed legal authority over the valley's extensive rangelands. Though some voices advocate limiting and even eliminating animal husbandry altogether in Nepal's mountain parks, until now Langtang herders have been left largely to their own devices, and the pastoral production system continues to function as an integral part of the Langtang economy. Before elaboration on the role of pastoralism in the local economy, there follows a description of Langtang's pastoral resources.

The Herds

Mountain cattle⁷, in the form of yak and yak–cow hybrids, dominate Langtang's pastoral landscape. They are by far the most important domesticated animal in terms of absolute numbers owned, the number of households who own them, the economic contribution they make to the household and village economy, and the social arrangements necessary to maintain them. Although sheep, goats and horses are raised in small numbers and some families keep one or two chickens, a dog and maybe a cat, these animals are all relatively few in number and figure less prominently in the household or village economy.

Figure 2 shows the percentage distribution of the main types of domestic livestock owned by Langtang Valley residents. The figures are based on data collected in 1997–1998, when local residents were asked how many livestock their family owned⁸. Langtang residents reported a total of 830 head of cattle, 163 sheep, 37 horses and 19 goats. Mountain cattle account for almost four-fifths (79 percent) of all domestic livestock in Langtang, in contrast to sheep that account for

15.5 percent, horses 3.5 percent, and goats 2 percent. Looking at the type of livestock owned by each household, cattle again rank first with 81 percent of households owning at least one animal. Less than half of that number raises sheep (38 percent) and even fewer raise horses (15 percent) or goats (5 percent). Not surprisingly, when the average number of animals is calculated per owner, cattle also rank number one. On average, livestock owners keep eleven head of cattle but less than half that number of other livestock.

Langtang Cattle

Langtang residents keep three main types of cattle: yak (*Bos grunniens*)⁹, cows (mostly *Bos taurus*) and an assortment of their crossbreeds. Yak account for approximately 40 percent of all cattle and most of these (90 percent) are female. The females are kept for their rich milk and strong, warm wool, while both sexes are kept for breeding. Originally from southern Tibet (Alirol 1979), yak are well adapted to Langtang's harsh Himalayan environment. Both males (locally called *yakbo*) and females (locally called *brimu*) are valued for their hardiness at high altitudes, as well as the fact that they are less labour-intensive than the more delicate crossbreeds, particularly in winter. Yak can graze on natural pastures up to 4,800 m when snow is absent (DUHE 1977), so some of the stronger animals (usually males) can be left to wander in the higher ranges on their own throughout the winter season. Crossbreeds, on the other hand, need to be taken to lower altitudes outside Langtang during the winter months and require significantly more winter fodder than yak.

Langtang herdsmen also keep some bulls (called *langbo*) and cows (called *ushu*). Though cows and bulls make up only four percent of the total cattle herd, they are highly valued as breeding stock, particularly the bulls. When crossed with pure yak they produce a hybrid that merges several characteristics of each parent in what is known as a classic heterosis (Palmieri 1976 in Miller 1993:Annex 1). That is, they are more vigorous than either parent species: they are stronger, produce more milk, and are better adapted to the intermediate zone where the

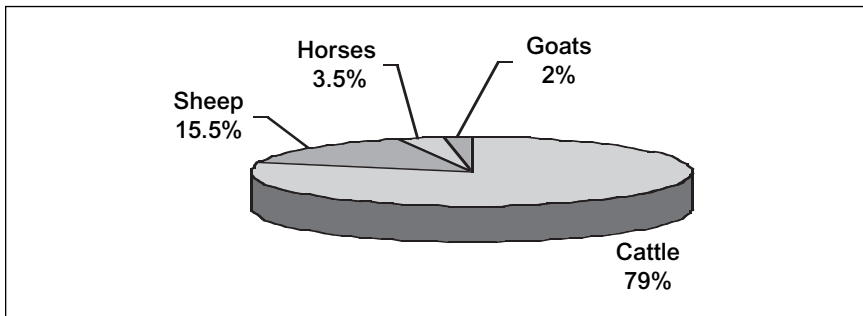


Figure 2: Distribution of the Main Types of Domestic Livestock Owned by Langtang Valley Residents

natural habitats of both parents overlap (Robinson 1993). They also thrive at a wider altitudinal range than either parent.¹ Langtang bulls are mainly of the dwarf Tibetan variety (*Bos taurus*) because lowland zebu cattle (*Bos indicus*) are susceptible to the cold and do not thrive in the Langtang environment. This preference for Tibetan cattle is said to be prevalent throughout the Nepal Himalaya and Bhutan (Miller 1993: Annex 1), yet despite this, it is likely that the gene pool resembles that found in the Khumbu region, ‘where every conceivable admixture of bovine genes seems to occur’ (Brower 1991: 99).

The yak–cow crossbreeds comprise the majority of cattle kept in the Langtang Valley – approximately 56 percent. All crossbreeds are generically called *chauri* in Nepali, but the local nomenclature is much more refined and distinguishes between nine types depending on the parentage and sex of the animal (see Table 1). As Bishop points out (1998:45, ft 1), extensive terminology is an indication of an area of cultural importance, so this well-defined vocabulary for genetic crosses suggests that like other herders in Nepal, Langtang cattlemen recognize heritable factors and considered them important in making decisions about herd management.

More than three-quarters of all crossbreeds in Langtang (79 percent) are first generation hybrids (F1 – meaning that both parents are of pure stock – and most of these are female (80 percent of all F1 hybrids). First generation crossbreeds are preferred because hybrid vigour or heterosis is exhibited in that generation only. Successive generations (second [F2] and third [F3]) lose their vigour and become less productive in every way than either parent. As a result, these animals are selectively culled from the herds, a fact reflected in their numbers, where they account for less than 10% of the total cattle herd.¹⁰ In contrast, first generation females (generically called *tsomo*), along with some first generation males (generically called *tsobo*), are willingly kept. The males are reared as pack and draught animals, and exported to Kyirong (in China), Nubri and Tsum (northwest of Ganesh Himal) (DUHE 1977b:47). They are useless for breeding as all male hybrids are sterile. The females, on the other hand, are fertile and rarely sold. First

Table 1: *Hybrid Nomenclature in the Langtang Valley*

Male Parent	Bos grunniens (yakbo)		Bos taurus (lango)		Generation
Offspring	M	F	M	F	
Female Parent					
Bos grunniens (brimu)	brimu	yakbo	brimstomo	brimsobo	F1
Bos taurus (ushu)	ushutsomo	ushutsobo	ushu	lango	F1
Bos indicus (rongpalang)	shantsomo	shantsobo	ushu or rongpalang	lango	F1
F1 hybrid (tsomo)	wormo	worpo	pamu	tolbo	F2
F2 hybrid (pamu)	pamtsomo	pamtsobo	pamu	tolbo	F3

generation female hybrids are valuable milking animals, which produce almost twice the amount of milk of female yak¹¹. They are also more docile than yak and considered easier to handle. However, their milk is considered to be of lower quality because the fat content is lower than female yak. They also require more winter fodder, which is in scarce supply in Langtang. Hence, first generation female crosses and female yak are kept in nearly proportionate numbers in Langtang: 36.5 percent and 36 percent respectively.

Data collected by several researchers shows that the Langtang's cattle population grew substantially in the twenty-five years between 1972 and 1997. Although the number of cattle declined slightly between 1972 and 1982 from 662 to 457, it rose again during the 1980s and 1990s (see Table 2)¹². Although the total number of cattle has increased since the early 1970s, it appears that the herd composition has not altered dramatically since that time, despite reports that the cheese factory has induced Langtang herders to maintain larger numbers of hybrids (see Miller 1992). According to Bonnemaire and Tessier's data, pure yak accounted for approximately 32 percent of the cattle population in 1972, while first generation hybrids made up approximately 47 percent (cited in Ono and Sadakane 1986: 96). This mirrors closely the cattle composition in 1997, where purebred yak (both male and female) represented 40 percent of the cattle herd, and first generation hybrids 45 percent.

The Role of Pastoralism in the Langtang Farming System

Langtang's economy is a three-pronged system based on agriculture, pastoralism and tourism. When local residents were asked to identify which sector contributed most to their household economy – defined to include both subsistence and/or cash gains – 87 percent reported one of these as their primary economic means¹³. The relative importance of any one sector to individual households varies significantly depending on a variety of factors including the amount of land owned, available family labour, and access to summer pastures. Individual preferences, abilities, opportunities and constraints also play a role in shaping household strategies. Overall, agriculture ranked first as a primary economic activity pastoralism as a secondary activity, and tourism as a tertiary activity (Table 2).

Table 2: *Primary, Secondary and Tertiary Contributions (in Percentage) to the Langtang Household economy*¹⁴

Source	Primary contribution	Secondary contribution	Tertiary contribution	Some contribution
Agriculture	50%	33 percent	8 percent	92 percent
Pastoralism	17%	40 percent	16 percent	73 percent
Tourism	20%	9 percent	30 percent	59 percent

Agriculture is primarily a subsistence activity, with over half of Langtang households (55 percent) consuming that which they produce. Despite its relative importance to the village economy, it cannot on its own support the valley's inhabitants. Cultivating in this glacial environment is challenging and crop yields have always been low. Littered debris left from Langtang's retreating glacier makes plowing difficult. Steep cliffs pinch the valley and limit the amount of land suitable for agriculture. The cold, windy climate ensures a short growing season and only one crop is planted in any given year. The remains of fields and houses abandoned long ago whisper the risks of farming here; residents tell how successive crop failures and a devastating avalanche finally forced the inhabitants to return to Tibet.

Officially, Langtang is listed as a food-deficit area (HMG 1993). The DUHE team (1977) noted that agricultural land in Langtang yielded only enough food for about three months of the year and Shrestha (1985) reported that only 9 percent of Langtang households had enough land to support themselves all year round. During the course of my own research, every household reported having to supplement crops with food grown outside the valley and over 47 percent of households reported having to buy at least some potatoes, barley and/or buckwheat, the main crops grown in Langtang. Other food items purchased by Langtang residents are wheat, rice, corn, lentils, salt, chilli peppers, sugar, tea and spice, which are usually paid for in cash. By all accounts, agricultural production has never been adequate to maintain the population and villagers have always made use of other means of support.

Pastoralism in Langtang takes up where agriculture leaves off. Milk, milk products (mainly butter, cheese and yoghurt) and meat¹⁵ are consumed directly by villagers adding valuable nutrients to the local diet. Subsidiary products, like manure and wool, are used for fertilizer, fuel, building materials and clothing. Animal labour is also highly valued, as male cattle (particularly first generation crossbreeds) make excellent draught and pack animals needed for ploughing fields and transporting goods. Yet even more important than their subsistence contribution is the value of these items as commodity goods. Pastoral products, especially milk and the offspring of animals, are a vital source of monetary income in a place with few cash-generating alternatives. Twenty-five years ago, the DUHE team (1977) noted that it was the earnings from animal husbandry that allowed food to be obtained for the months when agricultural yields were insufficient – nine months out of twelve, according to their reckoning.

Several Langtang informants were asked to rank the various types of cattle according to their perceived usefulness and value. Table 3 features the average ranking of each, along with the products and services obtained from them (which are highlighted). The X marks the primary use of each animal. As the Table shows, female cattle are preferred, reflecting the fact that animal husbandry in Langtang is geared primarily towards milk production. Four of the top five cattle types are also breeding stock, which is the most important livestock function after milking.

Table 3: Cattle Type and Use Ranked by Preference

Rank	Cattle type	Use						
		Milk	Breeding	Transport	Ploughing	Manure	Meat	Wool
1	Tsomo	X						
2	Brimu	X	X					
3	Ushu		X					
4	Lango		X					
5	Yakbo		X					
6	Tsobo			X	X			
7	Pamu	X						
7	Wormo	X						
8	Tolbo			X				
9	Worpo			X				

Combined, milk production and breeding are the top cash-generating activities associated with animal husbandry, highlighting the relationship between pastoralism and the cash economy above anything else.

Pastoralism and the Quest for Cold, Hard Cash

Langtang people, like other high mountain dwellers in Nepal and elsewhere, have long relied on cash sources to supplement the agro-pastoral subsistence economy. The Khumbu Sherpas to the east and Dolpo herders to the west did this primarily by acting as middlemen in the Tibetan salt trade. The Gurung of mid-western Nepal served as mercenary soldiers, the Tamang were well-known as porters, and Yolmo people have long had a history of circular migration outside Nepal. Historically, Langtang herders traded livestock for grain with people in the Yolmo valley, an area accessible from Langtang via the Kanja La and Sermasalang passes. They also travelled to Trisuli Bazaar to barter and trade medicinal plants and other wares¹⁶. Although the harvesting of medicinal plants has now been banned by the park, villagers today at least partly meet their cash needs another way: by selling milk and breeding yak.

Milk as a Commodity Resource

Although rarely consumed fresh, milk is undeniably the most important animal product in Langtang. In the past, Langtang families processed most of their milk into butter, which would then last a good part of the year especially given the cold climate. Butter was an important component in the local diet and remains an important ingredient in many Tibetan Buddhist rituals. Herders also make a cheese called *chiurpi* by drying the extracted protein (milk curds) left over from butter making. Hard and sour-tasting, it is excellent on its own or softened into soups and stews¹⁷. Today, very few families make their own butter and almost no one makes *chiurpi* anymore. Instead, most herders sell their milk for cash to the Kyangjin Gomba Cheese Factory, which is located at the herding station of the same name¹⁸.

The Dairy Development Corporation of Nepal established the Kyangjin Gomba Cheese Factory in the early 1950s with technical assistance from the Swiss. They opened it as the first dairy production centre in the country to process cheese and butter using milk from female yaks and yak–cattle hybrids (Miller 1992:1). Although the factory only produced about 500 kilograms of cheese in its first year of operation, it now produces more than ten times that amount and yak cheese has since become a well known commodity in Kathmandu. Throughout the 1990s, the Langtang Valley was producing approximately 6,000 kilograms of cheese per year, an increase of 55% since 1985 according to Miller (1992:1).¹⁹ More than two-thirds of the cheese produced was sent to Kathmandu for sale and/or redistribution to other retail outlets in Nepal. The remainder was consumed locally, with most of it sold to lodges servicing foreign tourists. The factory also produced approximately 1,800 kilograms of butter per year, almost all of which was sold to local families. Though fewer households produce it themselves, almost everyone still requires butter to maintain their haymaking rights²⁰.

The cheese factory operates between June and late October, which corresponds with the milking season in Langtang. The main production centre is located at Kyangjin Gomba (altitude 3,840 m), but there are also several mobile processing locations scattered throughout the summer ranges. These smaller ‘satellite’ stations facilitate milk collection during the peak production periods and ensure that the milk is processed fresh while the herders are stationed in the highest, most distant summer pastures.

According to the cheese factory manager, the factory collects about 450 kg of milk per day, but daily milk collection can range from 800 to 1,000 litres per day during peak production periods (Miller 1993: Annex 1). In 1996, fifty-nine producers sold 44,559 litres of milk to the factory, earning a sum total of 480,250 Nepali Rupees in the process, or an average of 8,140 Nepali Rupees each. The numbers were even higher in 1997, with sixty-one producers earning 720,627 Rupees total, an average of over 11,800 Rupees each²¹. The cheese factory also provides salaried employment (both seasonal and permanent) to some ten Langtang residents.

Since the opening of the Kyangjin Gompa Cheese Factory, the sale of milk has become one of the mainstays of the Langtang economy. Along with tourism, it is one of the few ways Langtang families can earn cash while remaining in the valley. It involves more households than any other cash-generating activity (almost two-thirds or 64 percent of Langtang households in 1996) and is the sole source of cash income for at least some families. Of the approximately 80 percent of Langtang households who owned female cattle in 1997, 73 percent were registered milk sellers at the cheese factory.

The sale of milk is a lucrative business for at least some Langtang families. According to the cheese factory records, 20 percent of Langtang households (eighteen producers) each earned over 10,000 Rs in 1996, which is more than most annual incomes in Nepal's mountain regions.²² Three producers earned over twice that amount, and the largest producer earned almost four times as much, receiving 39,949 Rs from the cheese factory that year. While earnings from milk sales can be substantial, the amount of money earned ranges widely between producers. The figures obtained from the cheese factory for the 1996 milking season illustrate this well. Although the average earning was 8,140 Rs per seller, the median income was only 5,299 Rs. Median income is a more accurate portrayal of a community than is average income because the latter can be skewed by extremes at either end of the spectrum. Indeed, approximately 64 percent of Langtang milk sellers (thirty-eight producers) earned less than the average sum in 1996, while only 36 percent (twenty-one producers) earned more. Even more revealing, the bottom 20 percent of earners claimed less than 3 percent of the total sales income, whereas the top 20 percent claimed over 51 percent. Individual milk sales ranged from a low of 605 Rs (approximately US\$ 10) to a high of 39,949 Rs (approximately US\$ 700), a difference of 1: 66. While selling milk is an important income activity at the village level, clearly individual families' ability to profit from it is highly skewed. This ability is mainly a function of having the necessary labour available to raise the animals and milk them on a daily basis. It is also dependent upon having access to the natural summer pastures on which animals graze as well as to the hayfields needed for winter fodder. Which summer pastures one has access to also plays a role in profits accrued, in that the type of animals pastured and the quality of grass eaten – which varies between pasture areas – affect the fat content of the milk produced, which is factored into the final selling price.

Although there is disparity between households in terms of who benefits from the cheese factory, the economic importance of the industry to the village economy as a whole is undeniable. There are rumours that the cheese factory at Kyangjin Gompa may be shut down because its production capacity is relatively low compared to other cheese making operations in Nepal²³. Government authorities are also concerned about the impact the industry is having on Langtang's forests. Should the factory close the Langtang economy will suffer dramatically as local people are now dependent on the cash earned by selling milk. There are also few alternatives available locally for generating monetary

income, particularly now that the Lantang National Park prohibits the harvesting of wild plants for sale. Lantang residents are keenly aware of this. Older villagers remember what life was like before the cheese factory came to the valley. In the words of one eighty-year-old man, himself a former Lantang herder and, in 1998, a respected elder of the community:

Previously, economic conditions were difficult and not as good as they are today. When I was a young man in Lantang, we didn't have as many yak and *chauri* as we do now. There was no cheese factory either. There were only a few *pamu* and *ushu* then. But now there is the cheese factory, and we have many *chauri* and *yak*...life is economically better now.

Breeding Bulls for Profit

Cattle breeding is another important pastoral activity in Lantang. It is critical for maintaining healthy herds and by extension the viability of the entire agro-pastoral production system. Fresh breeding stock has always been brought periodically into Lantang from Tibet to strengthen the local gene pool. According to Miller, prior to the Chinese takeover in 1959 there was frequent movement of animals across the border and into the valley (Miller 1993: Annex 1). However, restrictions on animal movements across the Nepal–China border, particularly in the late 1970s and 1980s, curtailed this practice for many years. In 1992, Miller reported that the last infusion of new blood into Lantang was in 1976, when yak bulls were imported from Tibet under a Ministry of Agriculture program (Miller 1993: Annex 1). The repercussions of this limited gene flow worried researchers and local herdsman alike, who expressed concern over the quality of breeding stock available in Lantang and Nepal as a whole (see Robinson 1993 and Alirol 1979). In fact, the Nepal Government considered the issue grave enough to warrant the establishment of several Livestock Development Farms across the country, including one in Nuwakot and another in the Khumbu region. One of the main goals of these farms was to supply purebred yak to breeders who no longer had access to their Tibetan supply source but they have not been a great success (see Brower 1991:139).

In January 1998, the Lantang community recognised that too-frequent inbreeding was weakening the herd and fresh genetic material was needed. They sent a delegation of six herders to Kyirong to bring back robust new breeding stock. According to the Village Development Committee (VDC) chairman at the time, this was the first occasion in many years that breeding stock had been brought from Tibet. Six yak bulls were selected by the delegation and purchased on behalf of the community as a whole using Village Development Committee funds, marking the first time that village monies were used for such a purchase²⁴. These animals now belong to the community at large, and they are available free of charge to all Lantang herders for breeding purposes. Each yak cost 15,000 Rs; with custom charges and travel expenses included, the total expenditure came to

102,000 Rs (approximately US\$ 1700). That such a large amount of money was deemed a sound capital investment testifies to the importance of animal breeding in Langtang, as the villagers recognise a direct correlation between the well-being of the herds and the financial well-being of the Langtang community as a whole.

Langtang herders breed pure yak as well as the popular yak–cow crossbreeds both for their own use as well as for sale. The sale of yak and yak–cow crossbreeds is a lucrative activity, and Langtang herders typically sell four to five bulls every year (Miller 1993: Annex 1). Livestock are sold directly for cash or exchanged for products like grain or other animals, particularly hybrids produced from lowland cows (locally called *shantso*) that are not bred locally. Yak bulls and female hybrids command the highest market prices, averaging around 13–14,000 Rs per animal. However, the prices can vary by several thousand Rupees depending on the individual characteristics of each animal, including age, productivity and colour, for example. In general, older animals are less expensive, whereas particularly strong yak bulls and/or pregnant females are higher priced. As noted above, in 1998 Langtang herders themselves paid 15,000 Rs (approximately US\$ 250) a head for breeding males from Kyirong and a pregnant female was purchased for 20,000 Rs (approximately US\$ 335). Thus, the sale of just one animal can be equivalent to or even higher than the average annual income per capita for Nepal.

Table 4, which lists the average market price of Langtang cattle by type, shows a distinction in price between parent and hybrid stock types on the basis of sex. In the case of parent stock types, the males command a higher price than the females by 25 percent or more. However, the reverse is true in the case of crossbreeds, where female hybrids command a higher price than the males by more than 50 percent. The distinction reflects the product value of pure and hybrid livestock. The purebred males are fertile and highly valued as breeding animals, whereas male hybrids, regardless of generation or parentage, are sterile and have little value except as pack animals²⁷. In contrast, the greater productivity and performance of the female hybrids as milking animals account for their higher market value.

Table 4: *Average Market Price of Langtang Cattle by Type*

	Sex	Livestock Type	Market Price
Parent Stock	M	Yakbo	13,000
	F	Brimu	7,000
	M	Lango	4,000
	F	Ushu	3,000
Hybrid Stock	M	Brimtsobo	6,000
	F	Brimtsomo	14,000
	M	Shantsobo	7,000
	F	Shantsomo	14,000
	M	Ushutsobo	5,000
	F	Ushutsomo	13,000

Langtang herders purchase most of their yak in the Langtang Valley²⁶, but only occasionally buy crossbreeds locally. Apparently, the demand for hybrids is greater than can be met by local breeding, forcing interested buyers to travel outside the valley to places like Gatlang, Golzung and Thummen in the western part of the district (see DUHE 1977:47). Informants also said that they prefer to purchase female shantso, the first generation crossbreed derived from mating yak bulls with lowland cows which are not bred in Langtang. Of the hybrids that are bred locally, the most preferred is the cross between female yak and Tibetan dwarf bulls. When the time is right, the two will be corralled together to encourage mating. The resultant offspring (called *brimso*) are either kept by the herder or sold, including the males, which are reportedly exported to Kyirong, Nubri and Tsum (see DUHE 1977).

Langtang herders, then, breed pure yak as well as the popular yak–cow crossbreeds for their own use. The biggest export market demand, however, is for purebred yak bulls. In this region of the country, yak are found predominantly in the Langtang Valley (DUHE 1977)²⁷, and it is this monopoly on pure yak breeding stock that has enabled Langtang herders to capitalise on the yak–cow production market. Langtang herders supply yak bulls to farmers throughout the north-central region of Nepal who cross them with cattle to produce hybrids. Miller writes that Langtang breeding bulls have been sold throughout Rasuwa and Nuwakot districts as well as to areas in Dhading and Sindhupalchowk (1993: Annex 1). According to local informants, the bulls are sold mainly to villages within the Bhoite Kosi watershed area – Golzung, Gatlang, Thummen (western Rasuwa), Timuri, Bridim, Thulo Shapru, Bharku, Paragaon. Langtang herders also noted sales in Helambu, a fact corroborated by Bishop (1998) who says that Langtang has been a source of livestock for Melemchi village for many years.⁸ DUHE (1977) also noted yak bulls being sold as far south as Boka Jhunda, upper Tadi Khola, Bakamghyang and Tempathang. Although yak do not live long at these lower altitudes, apparently cross-breeding the bulls with cows is profitable enough to warrant their frequent purchase from the Langtang Valley.

Yak breeding in Langtang, then, is linked to the sustainability of farming systems throughout north-central Nepal, a fact that Miller notes has never fully been appreciated by development planners. He writes,

The significance of Langtang as a source of yak bulls to produce *chauri* and, therefore, to enable producers in other areas to earn cash income from milk sales needs greater recognition in agricultural development strategies for these high elevation areas of central Nepal (Miller 1993: Annex 1)

Conclusion

Like people everywhere, Langtang villagers pursue economic strategies that are structured by physical, social and economic conditions operating at the local, regional, national and even global levels. Together, these conditions shape the

community's ability to adapt, survive and even prosper in a relatively harsh and marginal environment. Although the Langtang economy has diversified over the last twenty years, mainly with an increase in international tourism and the availability of government and non-government salaried positions, clearly agropastoralism continues to play a key role in household economic strategies. With 82 percent of Langtang households owning at least some livestock in 1997–1998, the pastoral sector remains a pervasive force in the valley.

Pastoralism is particularly important as a cash-generating activity. Moreover, it offsets the risks that accrue from relying too heavily on tourism (the other major cash-generating sector in Langtang). This is important because tourism is particularly sensitive to economic, political and other fluctuations that occur rapidly and are beyond the control of local people. The drastic impact of world events on Nepal's tourism since 2001 illustrates this point well. According to the 2001 Asian Development Bank's annual report, Nepal was adversely affected by the global economic slowdown following the 11 September terrorist attack on the United States in that year. Tourism and trade were particularly hard hit and tourist arrivals declined by 17 percent. More recently, the outbreak of SARS in the spring of 2003 have reduced international tourism to a trickle, especially in the Asian region. These events highlight the vulnerability of the tourism industry in general and they support the conclusion that tourism in Langtang does not offer a viable alternative to pastoralism *per se*.

By tapping a variety of ecological, social and market niches, Langtang residents maximise the full range of opportunities offered them and minimise the risks that are inevitably part of the human adventure called 'Life'. Pastoralism in Langtang is needed to ensure the health of both the local farming system, and the wider regional farming system in north-central Nepal. While it may not produce sufficient income in its own right for all village households, together with agriculture and tourism it provides the economic means for Langtang residents to remain in the valley and make a living.

Notes

1. Himalayan rangelands are diverse in structure and composition and include Steppe-like rangelands, mountain desert shrublands, alpine valleys and forest meadows (see Miller 1995:3–4; and Richard et al. 2000:7).
2. See, for example, Bishop's (1998) account of Melemchi herders in the Yolmo valley of Helambu, who rely on external circular migration to survive.
3. The DUHE team conducted extensive research in the Langtang Valley area between June 1976 and May 1977.
4. This figure is based on data recorded at the Kyangjin Gompa weather station between January 1996 and May 1998.
5. The upper contours to the south of the main ridges are almost continually covered with drizzling mist and cloud, between c. 2,000–6,000 m in the summer months (DUHE

- 1977). Clear, drier weather is much more common in the winter, however, which is generally true all over Nepal.
6. These figures are based on a demographic survey carried out by me with the help of a local field assistant between September 1997 and April 1998.
 7. For the sake of simplicity, I use the word 'cattle' in the same way as Brower (1991) to generically refer to all bovine species in Langtang, which include yak (*Bos grunniens*), two species of 'cow' (*Bos taurus* and *Bos indicus*), and their various hybrids.
 8. Some people underreported the number of livestock owned by their household. Although figures were cross-checked and adjusted whenever possible, the numbers reported here should be read as approximate estimates only.
 9. Yak is a term derived from the Tibetan word for male *Bos grunniens* and in Langtang, like elsewhere throughout the Himalaya, local people use another word to refer to females of the species. However, because 'yak' has become the common term applied to both male and female animals of the species, I will use it here as a generic term for both sexes of *Bos grunniens*. When I want to distinguish between the sexes, I will use the local terms applied in Langtang: *yakbo* for males and *brimu* for females.
 10. As practitioners of Tibetan Buddhism, Langtang residents are proscribed from directly killing their animals. A culturally approved method of getting rid of unwanted livestock is to tie them up so that they cannot nurse or graze. Eventually the animals die of starvation.
 11. They produce approximately 575 kg surplus per year as compared to only 350 kg surplus per year for yak (DUHE 1977).
 12. 1972 data taken from Bonnemaire and Tessier (1976), cited in Ono and Sadakane (1986); 1982 data taken from Ono and Sadakane (1986); 1992 data taken from Miller 1993: Annex 1 (approximate figure only).
 13. Local residents identified several other sources as well, namely salaried employment, casual labour, religious service and carpentry. Although the latter play a marginal role overall in the village economy, they are important to at least some Langtang families, particularly as a means of securing cash.
 14. This data is based on the responses of 94 households; some households, though they keep a separate hearth, are economically tied to other households and thus were not counted separately here. During the survey, respondents were asked to rank, in order of importance, the occupations and/or sectors from which they obtained their livelihood, taking into consideration both monetary and non-monetary sources. My research assistant, in translating the question into Tibetan, used the term *Kepsang* (lit. *khe-bzang*). According to linguistic anthropologist Geoff Childs (personal communication), the term literally means 'profit' but is non-specific in terms of source – i.e. through monetary or non-monetary economic activity.
 15. Unlike their Hindu counterparts who consider the cow sacred and are religiously proscribed from consuming its flesh, Langtang villagers like beef very much and eat it whenever they can. However, as in most pastoral societies, meat is rarely seen on the culinary menu. The only time I saw anyone sell or eat yak meat in Langtang was when an animal was killed by a predator or died accidentally.
 16. Travel to Trisuli was itself a considerable feat involving a ten-to-twelve day round-trip over steep and rough terrain. Today, needed items are much more easily attained, as most things can be found at the road head at Shyapru Bensi – a mere two-day trip for the majority of locals.

17. Bishop notes that *chiurpi* is a 'quintessential trail food – light, portable, good to suck on, full of fat and protein, and it lasts forever' (1998: 3).
18. The Kyangjin Gomba Cheese Factory is one of two cheese factories located in the Langtang National Park. The other is located at Chandan Bari in the southwest region of the park (altitude 3,254 m). The economic success of these cheese factories in highland Nepal prompted the establishment of seven others in various parts of the country (Miller 1993: Annex 2).
19. Throughout the 1990s, the Langtang Valley was producing approximately 6,000 kg of cheese per year, an increase of 55 percent since 1985 (Miller 1992).
20. Hay is a critical winter fodder source in Langtang and hay fields are strictly controlled by the two local monasteries in the valley.
21. Earnings in 1997 increased by 240,077 Nepali Rupees, nearly 50 percent over 1996. While production did rise, the difference in earnings is largely due to an increase in the price of milk per litre, which rose from 1.75 Rs/l in 1996 to 2.25 Rs/l in 1997.
23. The Chandan Bari Cheese Factory in Helambu, for example, produces nearly three times as much cheese and butter as the Kyangjin Gomba factory. In 1997, the manager there told me that on average, they produce 17,000 kg of cheese and 6,200 kg of butter.
24. The VDC chairman reported that in the past, breeding yak were sometimes bought collectively but not with VDC funds. These animals were usually bought in Langtang, not Kyirong.
25. Unlike the Khumbu area, where pack animals have become a lucrative asset in the tourist industry (see Brower 1991), in Langtang they are rarely used.
26. Herders from Dolpo say that they prefer to buy yak from within their own communities because yak bred in Tibet are more likely to die (McVeigh 1994; Richard 1993). Although no one in Langtang ever mentioned this, it is possible that the same is true in the Langtang Valley.
27. In 1977, DUHE reported that within the region, female yak are exclusive to the Langtang Valley. However, in 1998, one Langtang informant reported purchasing a female yak in Timure, which is located on the Nepal side of the Tibet-Nepal border.

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Himalayan Herding: Pastoralism in Langtang

Colleen McVeigh is a University-College professor in the Department of Anthropology at Malaspina University-College in Nanaimo, British Columbia, Canada. She can be reached by email at mcveighc@mala.bc.ca

¹ See Brower (1991) for a more detailed description of the strengths and weaknesses of hybrid types.

² Two Langtang families do, in fact, own female *Bos indicus* (locally called *rong palangh* whom it is pastured.