The Pastoralism in the Andes and the Himalayas

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Abstract

People in the Andes and the Himalayas make their living by adapting themselves to the highland and have some common cultural elements such as the use of the terraced farmland, the cultivation of different kinds of crops according to the difference of elevation, but there are big differences, especially in animal herding systems. The Central Andes is located at low latitudes and there is little difference in temperature throughout the year, so it is possible to herd llamas and alpacas throughout the year on highland plateaus, and Andean pastoralism has the unique characteristics of being sedentary, totally different from the forms of pastoralism of the Old World. On the other hand in the Himalayas, in contrast to the Andes, there is a big temperature change over a year and the herders of yak or zum pursue a typical pastoral transhumance. Comparing the cases of the Andes and the Himalayas, we can abstract 5 types of movement of pastoralism. In the Andes there are full-time pastoralism and agro-pastoralism. The former is “sedentary” and the later is “mobile agriculture and sedentary pastoralism.” In the Himalayas there are also full-time pastoralism and agro-pastoralism. Their characteristics are different from those of the Andes. Himalayan full-time pastoralism is “mobile pastoralism” or typical pastoral transhumance. Himalayan agro-pastoralism has two sub-types: one is “sedentary agriculture and mobile pastoralism” and the other is “mobile agro-pastoral complex.”

Key words: Andes, Himalayas, pastoralism, sedentary, transhumance

1. Introduction

The purpose of this paper is to show the characteristics of the traditional forms of adaptation and utilization of mountain ecosystems, comparing the cases of the Central Andes and the Central Himalayas and concentrating on pastoralism.

People both in the Andes and the Himalayas make their living by adapting themselves to the highlands and exploiting ecosystems of a variety of altitudinal zones distributed over relative proximity. They have some common elements, such as the use of the terraced farmland, the cultivation of different kinds of crops according to difference in elevation and the herding of domestic animals adapted to low temperatures. They differ, however, in their forms of adaptation, especially in animal herding systems. Also, even within each area there are considerable variations.

As the Central Andes are located at low latitudes, there is little difference in temperature throughout the year, and it is possible to herd llamas and alpacas year round on highland plateaus. For this reason, Andean pastoralism has the unique characteristic of being sedentary, different from the forms of pastoralism found in the Old World. On the other hand, in contrast to the Andes, there is a typical pastoral transhumance (seasonal vertical movement of domestic animals) in the Himalayas.

I have done intensive fieldwork in both Peru and Nepal, mainly in Puca of southwestern highlands of Peru, and in Solu of eastern Nepal. I would like to present and compare the cases of these two areas, and also two more areas, i.e., Q’ero in the eastern cordillera flank of Peru, and Rolwaling and Khumbu (north of Solu) of Nepal, for which I refer to some ethnographic data1. The latter cases show different types of adaptation from the former two.

2. Indigenous Quechua pastoralism in the Andes

2.1 Southwest highlands in the Central Andes – the case of the Puca District

I have done fieldwork several times since 1979 in the District of Puca, Department of Arequipa, Peru, which is located at the western end of the high plateau in the southern Central Andes (Fig. 1). Puca extends 30 km both from south to north and from east to west. It is located in an area of 3,000 to 5,000 m a.s.l. Most of the area (97%) is highland plateau at more than 4,000 m, and the rest is valley (Photo 1). The
plateau is beyond the upper limit of agricultural zone, but it has rich grasslands (Photo 2). Nearly 500 pastoralists live there. In the valley where the climate is relatively warm, about 2,000 farmers live and cultivate mainly potato and maize on terraced farmlands (Photo 3).

The ecological environment of the Central Andean highlands is thus divided into the plateau and the valleys, and generally people in each area engage in pastoralism and agriculture, respectively. The District of Puica thus has two communities, namely, a pastoral community and an agricultural community, and these two have a close reciprocal dependence on each other.

The domestic animals kept in the Andean highlands are llamas and alpacas (Fig. 2). The llama is a little bigger than the wild guanaco, and is the biggest Andean camelid. The llama is the domestic animal used for transport. A mature one can carry on its back up to about 40 kg and travel about 20 km a day. A caravan is usually composed of from 10 to some tens of llamas (Photo 4).

**Fig. 1** Location of Puica District, La Unión, Arequipa.

**Photo 1** Puica Valley.
Photo 2  Alpacas in the U-shaped valley at 4,500 m.

Photo 3  Farmers cultivating a terraced field with "chaktaqlla".

Photo 4  Llama caravan carrying agricultural products from the valley to herders' domicile on the plateau.
Alpacas are smaller than llamas. The quality of alpaca wool is superior to that of the llama in its strength, warmth and texture. Therefore the purpose of alpaca herding is for wool production (Photo 5). Wool was once an important article in trading with farmers for agricultural products, but as alpaca wool began to be exported abroad and its price became high, it has come to be sold mainly for cash since the 1960s.

In Puica, the pastoral people tend to form extended families, each of which keeps about 300 to 400 domestic animals (up to 2,000 as a maximum), 70 or 80% of which are alpacas, with the rest being llamas.

Native herders in the Andes have never milked their domestic animals. They eat the meat of the animals, but it is not their principal food. Their principal foods are agricultural products, such as potatoes and maize, just like those of the neighboring farmers.

They have two traditional ways of gaining agricultural products, as follows. In the first way, herdsmen go down to farmers’ villages in the canyons in April and May in the harvest season with caravan of llamas, carry crops from the terraced farmland to the farmers’ houses, and get some of the crops in exchange for the transport work (Photo 6). The second way is by exchange. They carry and trade meat, dried meat, dung of animals, rock salt, fruit, or earthenware for agricultural products in exchange.

Pastoral people on the high plateau of Puica mostly live in the U-shaped valley, which has a scattering of rich alpine moors, best suited for pasturing alpacas (Photo 7). Their houses together with surrounding pastureland are called “estancia.” The average size of each estancia is about 20 km² in Puica. People recognize the boundaries by natural indexes such as rivers, rivulets, ridges, unusual rocks, etc.

Pastoralists usually have two domiciles within their estancia. Figure 3 is a surveyed map of an estancia at 4,500 m. The main domicile is located near the rivulet, which flows from the slopes of the U-shaped valley, so it is easy to get water for daily life (Photo 8). The rivulet sustains the alpine moor plant community throughout the year, upon which the...
alpaca is dependent for optimum health and reproduction. There are six stone houses and some big and small stone corrals for the livestock at the main domicile (Fig. 4A). The big corrals, called “waran”, are for keeping the livestock at night and the small corrals, called “runtu cancha” (corral for cutting), are used for cutting alpaca wool, loading and unloading the freight of the llama-caravan, or for rituals involving the livestock. These corrals are small so that the herders may control the movement of the domestic animals inside of them.

In addition to the main domicile, there is a sub-domicile called “astana.” There is only one house there but there are many corrals for the livestock (Fig. 4B). The sub-domicile is on top of a swell (gently sloping hill). The distance between domiciles is only a little more than 1 km, and between

Photo 8 Andean herders’ main domicile, which is located near a rivulet and alpine moors.
these places, some of the family members and all of
the livestock make seasonal movements.

This seasonal movement is limited to the area of
one “estancia.” There is hardly any difference
between the altitudes of these places. During the dry
season (May to October), they move about every
month for grass rotation between these two houses.
During this season, the domestic animal sleep inside a
half opened corral called “waran” (Figs. 4A and 4B).

During the wet season from November to April (it
is summer, but there is often snow on the plateau), the
livestock are kept inside a corral at the sub-domicile,
which is located on a well-drained swell. The wet
season is the time of lambing of domestic animals.
For protection of the newborn animals from foxes or
condors, the livestock are all kept in a big, neatly
closed corral called a “chaupi cancha (central corral)
and the herders rotate corrals 1-4 (Fig. 4B). They
also rotate the small corrals (A, B, C) called “rutuna
cancha.”

Andean camelids have a habit of leaving their
dung in the same place, so in the wet season the
ground of the corral gets muddy with the mixture of
dung and there is a risk of pollution with contagious
bacteria. Newborn domestic animals have a high
mortality rate during the wet season, so it is important
to maintain well-drained corrals in order to reduce the
death rate. This is the reason why there are many
corrals for rotation at the sub-domicile.

Thus the most important object of the micro-scale
seasonal movement of the Andean herders is to secure
better conditions for the corrals in the wet season.

2.2 The eastern cordillera flank of the Central
Andes – the case of Q’ero

The Q’ero culture region is located along the “ceja
de montaña” or “eyebrow” of the high cordillera,
which overlooks the upper reaches of the Amazon
basin to the north and east (Webster, 1973: 118).
Between the heavily glaciated peaks of the Ayakachi
range at 5,300 m and the subtropical forest, or yunka,
at 1,800 m, the terrain descends 11,500 feet in just
30 km of rugged trail (ibid.). In Q’ero a form of
agro-pastoralism can be observed which is entirely
different from the case of Puica (Photo 9).

The distance between the east and west of Q’ero is
60 km and the altitude of the living zone ranges from
4,800 m to 1,400 m. At the four valley heads of
Q’ero (4,300 m), there are hamlets of stone houses
with about 370 inhabitants (Photos 10 and 11).
These hamlets are connected by a path and make one
community as a whole (Webster, 1983: 32-33).
People call these main domiciles “Qatun wasi” (big
house), though the houses themselves are not big.
Each of them is composed of a permanent house, a
storehouse and some stone corrals for the livestock.

Where the four valley heads converge (at 3,400 m),
there is a central settlement called “Qatun (large)
Q’ero” (Photo 12). There are stone-pile houses, a
small Catholic church and a school. However, this
village is usually deserted. It serves as a gathering
point for meetings, preparations, feasts and rituals at
certain times of the year and is characterizedly silent
and vacant the rest of the year (ibid.: 120). In these
intermediate altitudinal zones, potatoes are the most
important product.

The houses of Qatun Q’ero are rather bigger than
those of Qatun wasi, but there are no storehouses nor
corrals there. Besides these settlements, there are
cottages 25 km away from Qatun Q’ero down in the
tropical zone, called “Pushkero.”

The area between Qatun Q’ero and Pushkero is a
very steep canyon and there are few cultivated fields.
In Pushkero, maize is the main product and other
tropical products are also cultivated. The wooden
houses in Pushkero are used only when needed, and
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Photo 10  The main settlement at the valley head of Q’ero.

there are simple tools for daily life in them but no foods are stored (Núñez del Prado, 1983: 16-17).

Thus, the people of Q’ero make use of three different ecological zones, each family owning different houses in each. They move quite actively among these three zones. It should be stressed, however, that this vertical movement is made for the purpose of agriculture and is done only by some members of the family. They establish their primary domicile in hamlets in the herding zone, and move family encampments around the intermediate and lower zones as necessary to maintain their cultivation regimes (Webster, 1973:119). The routine tasks of herd supervision are usually assigned to women or children, while the balance of the family is occupied with the more intensive tasks of cultivation, movement, or transport (ibid.)

Photo 11  A family in a house of the main settlement.

Photo 12  People gathering in front of the church of Qatan Q’ero.
As llamas have good adaptability to foods and environments, they are used for carrying the potatoes or fertilizer between the valley heads and Qatun Q’ero. Also, as the way to Pushkero is rather steep, the llama is indispensable as the only means for transporting the maize (Webster, 1983: 37). However, the purpose of the movement of llamas is for transportation and not for pasturage. This pastoralism is basically sedentary and the vertical movement of the domestic animals (llamas) is done in accordance with agricultural cycles.

3. Traditional pastoralism in the Himalayas

3.1 The Sherpas of Solu in eastern Nepal

It is believed that Sherpas came from eastern Tibet, crossing the Himalayas down to the Nepal side. Their life is supported by agriculture with barley, wheat, maize and potatoes as the main products and by herding yak, cows or cross-breeds of the two (zum) and also by trade with Tibet.

Recent jobs, such as sightseeing business, providing tour guides for mountain climbing and trekking, running lodges and so on, are also supporting their life.

The Solukhumbu district of Sagarmatha zone is the main dwelling area for the Sherpas and is divided mainly into Khumbu in the north and Solu in the south (there is also a canyon called Pharak between them) (Fig. 5). The Sherpas in Khumbu or Rolwaling live at very high altitudes and can be called “Highland Sherpas.” “Highland Sherpas” live in places higher than 3,000 m. On the other hand, Solu is lower than Khumbu, and its climate is warmer than Khumbu’s. In Solu, Sherpa settlements are mainly found in the zone between 2,000 m and 3,000 m. Junbesi village (at 2,700 m) is one of the central places of Solu and is one of the oldest villages (Photo 13).

I did fieldwork in the valley of Junbesi and the area upstream of it, called Basa Valley, with members of various disciplines several times in the 1990s. The Junbesi-Basa valley belongs to Beni Gabisa (Local development area) where there are some 23 settlements with about 300 households. The majority of the inhabitants of Beni are Sherpas, but other ethnic groups such as Newar or Magal also live in the lower zone. Sherpas are divided into several patrilineal clans (a kind of descent group) called “ru” (meaning “bone” in the Sherpa language). In Solu, a village consists of one dominant clan generally, while on the other hand, in the Khumbu, several different clans live intermixed. The patrilineal clan is an exogamous

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Fig. 5  Map of Solukhumbu Area (1:500,000) (taken from Yamamoto and Inamura (eds.), 2000).

Photo 13  Junbesi village at 2,700 m in Solu.
unit (marriage between members of the same clan is forbidden), and therefore, in single-clan villages like Junbesi, a man must receive a wife from another village.

In the Junbesi-Basa valley most of the families engage in agriculture, and some of them herd yak or zum (cross-breeds) in addition to farming (Photos 14 and 15). The herdsmen pasture their livestock in their own clan's lands, which are scattered along the valley, doing pastoral transhumance.

Zum can produce more milk than female yak (nak) so the purpose of herding zum is for the milk (Photo 16). Butter is made by churning the milk and is sold in the marketplace. Interestingly, the female cross-breeds are fertile but the male cross-breeds called "zopkyo" are sterile. Thus, to get milk from a zum (female cross-breed), it is necessary to have it breed with a bull and let it have a calf. The zum's calves, or the second generations of cross-breed, are much inferior in production of milk and strength. Their economic value is low, so they do not get enough care and most of them die soon after birth.

As for the yak-herders, milking is only a sideline and their main business is to produce zum by mating a nak (female yak) with a bull. Therefore, yak herds (some tens of females and a yak stud) include at least one bull. At first, they try breeding a nak with a bull and if this is not successful, they try it with a yak. When the newborn is a zum, it can be sold at a high price (about 150 dollars), but a nak is sold only for a quarter of a zum's price. The male yak is almost worthless.

The transhumance of yak and zum can be roughly explained as follows. During winter the domestic animals are pastured in the forest near the settlement and dried grass is given to them when it is needed. From the spring on, they are moved upward along the valley gradually, and in the summer, they are pastured at the valley head higher than 4,000 m. In the fall, they are moved back to the lower part of the valley again. Figures 6 and 7 show the transhumance routes of two families of the Lama clan of Junbesi village. The dotted arrows show a case of transhumance done in 1993 by a family that was engaged in yak-herding at altitudes between 3,100 m and 4,600 m. Yak-herders stay for about three months from the beginning of July at the summer pasturals higher than 4,000 m (Photos 17 and 18), and in winter they stay at low pasturals (3,100 m) for about five months from December. Names of places on the left side of Fig. 7, besides Junbesi and Pangkarma villages, are the Lama clan's pasturals in the valley, where they stay and pasture their livestock.
Fig. 6 Routes of yak-herding and zom-herding of Junbesi-Basa Valley (taken from Yamamoto and Inamura (eds.), 2000).

Photo 17 Yak (nak) herd at Kyau, a summer pasturwoodland of the Lama clan of Junbesi at 4,300 m.

Fig. 7 Routes and elevation of pastoral transhumance in Junbesi-Basa Valley.

The solid arrows show a case of transhumance done in 1992 by another family which is engaged in the herding of zum (Fig. 6 and 7). In winter, they stay around Junbesi village or in lower forests for about 5 months from December. Compared to yak-herding, the winter pasturelands of zum-herding are 500 m lower. They stay at the summer pasturelands in July together with the yak-herders, but they stay for only about one month and then they go down the valley (Photo 19-1, 19-2, 19-3).

At the summer pastureland “Charungka,” there is a small settlement of about 10 stone cottages (Photo 20). There is also a communal cottage for ceremonies and meetings, where the summer festival “Yerchang” is held from the end of July till the beginning of August. “Yerchang” starts at “Lumitang” (the place of “Lu” or white snake shaped goddess of water), situated 250 m up along the north wall of Charungka, then proceeds to Tsotang, a lake situated 4,800 m a.s.l., which is Lu’s place too. The herders pray to Lu there (Photo 21). Then all the families of the herders gather at the meeting cottage in the evening and a Tibetan Buddhist priest who is invited from a nearby monastery recites sutras until late in the evening (Photo 22).

There is a small shrine for Lu in Junbesi village, too. The water goddess goes up to the valley head when the herders climb up the valley with their livestock and comes back down to the village when the herders come down in the fall.
Photo 19-1  A Sherpa family preparing for transhumance of zum-herding to the lower side of the valley.

Photo 19-2  A Sherpa carrying bamboo roofing mats for the next stop in transhumance.

Photo 19-3  Arriving at the next site, they put mats over the stone wall of the house to stay for several days pasturing zum.
Photo 20  "Charungka," the main summer pastureland of yak- and zum-herders of the Junbesi Lama clan at 4,000 m.

Photo 21  "Lumitang" (the place where the Water Goddess lives), where the Sherpa and Gurung herders pray together.

Photo 22  At night, herders meet together at the communal cottage in Charungka and monks read sutras there.
3.2 The Gurung sheep-herders

From Rumjatar (1,300 m) of Okhaldhunga district, which is located in the southern lowlands some 50 km away from Junbesi, some groups of Gurung sheep-herders come to Charungka, the summer pastureland. The Gurung herders pay money to the clan’s chief for the use of pastureland of the Lama clan of Junbesi village. Yerchang is celebrated by both Sherpas and Gurung. Gurung herders spend about one month at Charungka, then go down the valley and stay in the agricultural fields of Junbesi after the harvest in autumn for about a month. They pasture their sheep in the forests nearby and gather them at night in the fields (Photo 23). By leaving the dung of sheep, they provide the Sherpa farmers with fertilizer. The sleeping places of the sheep are moved everyday one field to another so that the dung may be scattered evenly (Photo 24). The owner of each field gives “tsampa” (a traditional Sherpa staple made from roasted barley flour) to the Gurung herders. After staying at Junbesi, they go down the valley. Near the border of India they sell their sheep for the Hindu festival in October. Then again in spring, they go up to the north toward Junbesi valley.

Thus, in the Junbesi-Basa valley, the Sherpa yak- or zum-herders and the Gurung sheep-herders join together, and these two ethnic groups have reciprocal relations. The summer festival “Yerchang” is also celebrated with the cooperation of members of these two groups.

3.3 The “highland Sherpas” in eastern Nepal

In the case of Rolwaling valley surveyed by Kano (Kano, 1979), the permanent settlements are at 3,700 m, and other settlements are scattered in the “low” lands between 3,550 m and 3,630 m and in the “high” lands between 3,850 m and 4,180 m. These settlements have farmlands in their surroundings, and there are other settlements called “kharka” scattered for the pasture of yak and cross-breeds between 4,050 m and 4,800 m. Thus, each family has houses in several agricultural settlements and also in the high settlements for pasturage, and some of the family members practice transhumance between those houses.

Surprisingly enough, highland Sherpa herders practice vertical seasonal movement in two cycles a year. It is done first in the period between spring and summer when they depend only on natural grasses and then in the period between late autumn and early spring when they depend to certain extent on stored hay. In the transhumance cycle of spring to autumn, they go up to the highlands in summer and go down to the lower lands in autumn according to the natural cycle. Also, in spring, cultivation starts gradually from the lower to the higher fields and the yak and zum must be driven to the higher elevation accordingly. In contrast, in winter (from late autumn to early spring), they go up to the highlands once more, which is against the natural cycle. They do this because when dried grass is lacking: they must drive their livestock to the highland settlements where hay gathered in autumn is stored in their houses. The movement of this period has the additional purpose of spreading fertilizer to the fields of each different elevation. In addition to this pastoral transhumance, “agricultural transhumance” is repeated from spring to autumn for planting, weeding and harvesting.

This form of vertical movement between houses at different elevations in the Himalayas reminds us of the movement on the eastern slope in the Andes discussed before. In the case of the Andes, however, the permanent domicile is situated at a valley head higher than 4,000 m and the movement is made to the lower lands only according to agricultural needs. Moreover, in some cases, a difference of 3,000 m in elevation is made use of by a single family, obtaining a variety of crops for their self-sustenance.

On the other hand, in the case of the highland Sherpas such as in the Rolwaling and Khumbu, the permanent houses are located at the middle point of the vertical movement. Furthermore, there, the movement is limited to highlands higher than 3,500 m and just a few kinds of crops such as barley and buckwheat and recently mainly potatoes are harvested.

The highland Sherpas practice pastoral transhumance in strong relation with agriculture. The
purpose of transhumance for them is to get higher productivity from pastoralism and agriculture. The use of farmlands at different elevations is to make the best use of the rather poor farmlands in the highland, by distributing labor time effectively (Führer-Haimendorf, 1964: 8), and by reducing the risks of the natural disaster and diseases. (Kano, 1978: 90; 1979: 14).

4. Pastoralism Adapted to the Highlands and the Typology of Movement

4.1 Sedentary pastoralism and mobile agriculture in the Andes

In the Old World, pastoralism is practiced mainly in dry or cold areas and it is usually assumed that the traditional forms of pastoralism would imply movement. In the Central Andes, however, sedentary pastoralism has been established. The pastoralism is sedentary and the agriculture is mobile in the Central Andes. On the other hand, in the Himalayas, vertical movement or transhumance is an important element in pastoralism. What makes such a difference between these two areas?

Figure 8 shows thermoisopleth diagrams (devised by C. Troll) which indicate the difference between the Central Andean highlands (El Misti in southern Peru) and the Central Himalayan highlands (Lhajung in Khumbu).

In the Andean highlands, there is little change in temperature throughout the year, though there is a big daily change in temperature. The ecological conditions are rather favorable and stable for domestic animals adapted to cold lands. In the Himalayan highlands, on the other hand, there is a big temperature change over a year and there is a distinct cold winter.

In the Central Andean highlands, there is a remarkable difference between the rainy season and the dry season, but alpine moors are maintained by glacial seepage to greater or lesser degrees throughout the year. The strong sunshine promotes the growth of grass there. For these reasons pastoral transhumance is not required and it is possible for the livestock to stay firmly in one place throughout the year.

Furthermore, because of tropical highlands, there is a big difference of the ecological conditions according to the elevation within a small horizontal distance. This encourages the farmers to move vertically and maximize the use of the different elevations to produce a variety of crops.

The agricultural zone and pastoral zone are clearly separated, and yet they are adjacent to each other. The characteristics of Andean pastoralism are related to these ecological conditions by which two types of pastoralism have been created.

The Central Andes lie between extreme eastern wet and western dry climates. Within such environmental variation, the dryness of the western plateau affects the "separation" more. Concretely speaking, in the case of Puca in the western highlands, the plateau area is separated from the valley by barren dry land, which forms a clear ecological and social barrier between the pastoral society and the agricultural society. In contrast, the humidity of the eastern slope of the Andes brings about environmental continuity between the agricultural and pastoral zones, and it affects the "adjacency."

Figure 9 shows a model of the characteristics of Andean pastoralism resulting from these two basic conditions of "separateness" and "adjacency" between the plateau area and the valley. In the case that "separateness" has a strong effect, it results in a form of "full-time pastoralism" (exclusively pastoral community) and in the case that "adjacency" has a strong effect, a form of "agro-pastoral complex" results.

Ecological stability made it possible to establish sedentary pastoralism. The transportation function of the llama established a close relationship between the full-time pastoralists and the farmers in the

![Fig. 8 Thermoisopleth diagrams of the central Andean highland and the central Himalayan highland (taken from Iwata, 1998).](image-url)
western highlands, while on the other hand, it developed an agro-pastoral complex on the eastern slope, where the llama was used for transportation of agricultural products for the farmers (agro-pastoralists) themselves. In addition to the "llama's transport potentiality," the "production of alpaca wool" strengthened economic relations between the full-time pastoralists and the farmers in the western highlands. Moreover the "adjacency" and "sedentariness" of the pastoralists created a close relationship between the full-time pastoralists and the farmers, which led them to form a structural relationship through various social activities (Inamura, 1986). All these conditions seem to have been the reasons for the no requirement of the use of milk for the diet of Andean pastoralists.

In the Andes, the ecological difference between the east and the west brought about two forms of adaptation. But in both cases, the pastoralism is sedentary, and it should be stressed that the vertical movement of the agro-pastoral complex is required only for the sake of agriculture.

4.2 Transhumance in the Himalayas

Solu area is situated at latitude 27.5° and there is more than 12° difference compared to southern Peru in latitude. For this reason, the annual temperature change is rather big (Fig. 9). Thus, pastoral transhumance is the most effective way to make use of the environment.

Transhumance in the Himalayas is basically adapted to the cycles of the natural climate. In Solu, the Sherpas have only one settlement and they do not pasture their livestock in the highlands in winter because of the low temperatures and deep snow. However, as it was shown already, in the case of the "highland Sherpas," there is a form of transhumance that goes against the natural cycles. As "it is often the case that agriculture and pastoralism are united as inseparable activities at the household level" (Kano, 1978: 86), in "highland Sherpa" areas where people have farmland and houses at various elevations, a literally unnatural movement in which the livestock is driven to highlands with fallen snow is made to supplement the lack of fodder.

Then what ecological differences are there between Solu (the lower Sherpa area) and Khumbu or Rolwaling (the highland Sherpa area)?

The Khumbu area is located between main Himalayan peaks such as Sagarmatha and front mountains such as Tamserk and Numbur. The valleys of Solu are located south of these front mountains and situated much lower than Khumbu. The monsoons bring moist air from the south and it provides much rain in the Solu valleys, passing over the front mountains. So in Solu it rains much more than in Khumbu and the conditions for agriculture in lower parts of the Solu valleys are much better than in Khumbu. On the other hand, though, in the monsoon season the Khumbu valleys have longer sunshine than the Solu valleys because of less rainfall, so in Khumbu it makes agriculture possible even in higher valleys (more than 4,000 m elevation), whereas cultivation is difficult in high valleys in Solu. Also, in winter there is much greater snowfall in Solu than in Khumbu, so in Solu it is impossible to pasture livestock in valley heads where the summer pastures are located, whereas in Khumbu it is possible to pasture yaks in high valleys even in winter, though it is very hard work for the herders.

For a supplementary explanation of the ethnic and cultural aspects of this region, we can assume the following account of migration. The ancestors of the Sherpas who moved to the Solu area won a battle against an occupying ethnic group and could obtain the rich valley. On the other hand, the ancestors of the highland Sherpas had to live in the highlands, which were not as suitable for agriculture as the lower lands. We can only assume that they tried to survive by making the best use of their environment. They made use of the possible limits of the cultivable land, and at the same time, dispersed labor time and risks from agricultural disasters for the improvement of productivity. By making the best use of the grass, the productivity of the pastoralism was also maximized.

As for the Gurung herders, they practice pastoral transhumance throughout the year and their form of pastoralism tends to be more full-time. This type of pastoralism is also seen in the western part of Nepal, India and in the northern part of Pakistan, where they herd sheep and goats as their main livestock, and pass through or stay in regions of other ethnic groups in their process of transhumance. Some of them engage in full-time pastoralism and others operate it together with trading (Kano, 1978: 94-95).
4.3 Pastoralism in the Andes and the Himalayas

The most important ecological difference between the Andes and the Himalayas is the climate, which is related to the difference in latitudes. Another important difference is the topographic one: the Himalayan landscape is more complex with more vertical variation than the Andean. Also many ethnic groups occupy the Himalayas, and the Sherpas occupy the higher part. On the other hand the Andes is rather simple in both geographical and demographic features. Geographically, in the middle of the Andean ranges there is a high plateau and on both sides valleys descend simply. Demographically and culturally the Andes is rather homogeneous because the Inca Empire unified most of the region in the 15th century. Thus on the eastern slope of the Central Andes, each valley is occupied by only one Quecua community, where each family uses most of the valley (from 4,800 to 1,400 m) for agriculture.

Finally, I would like to compare pastoral movement in the Andes and the Himalayas. Figure 10 shows a model of the two types of pastoral movement in the Andes, that is full-time pastoralism and agro-pastoralism. Figure 11 shows a model of the three types of pastoral movement in the Himalayas, that is two sub-types of agro-pastoralism and full-time pastoralism. Table 1 shows these five types of pastoral movement. From the top, the first two types are Andean (Fig. 10); the first one is full-time pastoralism which is “sedentary pastoralism” without any factor of transhumance, though it implies very small scale pastoral movement with the special object of avoiding pollution of corrals during the rainy season. The second is agro-pastoralism, and its characteristics can be described as “mobile agriculture with sedentary pastoralism.” The next three types are Himalayan (Fig. 11). The third is the agro-pastoralism of the highland Sherpas which is a “mobile agro-pastoral complex.” The fourth is the agro-pastoralism of Solu and it is “sedentary agriculture with mobile pastoralism.” The last one is the full-time pastoralism of the Gurung people and of the western Himalayas.

Fig. 10 Two types of movement in the Andes.

Table 1 Typology of the pastoralism adapted to the mountain ecosystem.

<table>
<thead>
<tr>
<th>Area</th>
<th>factor of movement</th>
<th>5 types</th>
<th>2 types</th>
</tr>
</thead>
<tbody>
<tr>
<td>the Andes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>western plateau</td>
<td></td>
<td>sedentary pastoralism</td>
<td></td>
</tr>
<tr>
<td>eastern slope</td>
<td></td>
<td>sedentary pastoralism &amp; mobile agriculture</td>
<td></td>
</tr>
<tr>
<td>the Himalayas</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Khumbu &amp; Rohwaling</td>
<td>+</td>
<td>mobile agriculture &amp; mobile pastoralism</td>
<td></td>
</tr>
<tr>
<td>Solu</td>
<td>+</td>
<td>sedentary agriculture &amp; mobile pastoralism</td>
<td></td>
</tr>
<tr>
<td>Gurung &amp; westerns</td>
<td>+</td>
<td>mobile pastoralism</td>
<td></td>
</tr>
</tbody>
</table>

which is “mobile pastoralism” or pure pastoral transhumance.

Though I have not discussed it in this paper, we can add the sixth type of pastoral movement in the highlands (though not special to the highlands), and that is sedentary agro-pastoralism. This type can be observed in Sherpa communities, where farmers pasture cows, sending them out of the village to graze daily in forests or fields after the harvest and bringing them back to their homesteads each night. In some parts of the Andean highlands, for example, where communities include ecological zones of high plateaus (or valley heads) and high basins (or valleys) which do not have so much difference of elevation, there may be this type of agro-pastoralism, too. We have only fragmented ethnographic data of this type of agro-pastoralism, because we have given less importance to it.

Furthermore, including cases of the Tibetan plateau, we can add another important type, pastoral nomadism, which I exclude from this paper to make the discussion clearer. We can treat nomadism as a variation of mobile pastoralism in a larger sense, though we can also establish another type, pastoral...
nomadism, to contrast with pastoral transhumance as a matter for further discussion.

The typology itself of forms of movement of pastoralism cannot elucidate the characteristics of the various aspects of pastoralism. There must also be intermediate types or variations that do not belong to the ideal types discussed here. However, the typology may be useful for a more profound understanding of forms of adaptation to the environment and systems of environmental preservation. It is also interesting that especially by comparing both the Andes and the Himalayas, all logically possible types of vertical movement in the highlands could be covered

References
(J: in Japanese)


2 Efficient mastication, fine fleece, and resistance to disease are attributed to pasture composed primarily of "k'unkuna (Distichia muscoides and Plantago rigida), found in the high altitude moors (Webster, 1973: 120). Llamas, with their broader tolerances of forage and terrain, are sometimes pastured in the intermediate or lower zones when their services in burden bearing are locally needed (Webster, 1973: 121).
3 Núñez del Prado, 1983:14-15; Webster says that the altitude of living zone ranges from 4,800 to 2,000 m (Webster, 1983: 35-39).
4 Brower says, "Khumbu yak, in an environment of often light and erratic winter precipitation, are not barred from high elevation grazing in the winter, and may be found in the highest subsidiary settlements in any season." (Brower, 1991: 126)
5 As for the seasonal transhumance in the Andes, some researchers suggested the transhumance (Custred, 1977: 68; Flores, 1975: 7-8; Orlove, 1977a: 84, 1977b: 20). However, there is no detailed case study reported regarding it. The result of my research showed that there was no evidence of a clear type of pastoral transhumance in the Central Andes as in the Himalayas, except the movement of llama caravan for transporting and trading.
6 Some types of pastoral movement may exist in the Central Andes as Orlove mentions, for example, "The pattern of movement of the herd animals corresponds to the availability of pasture. The herds are moved to lower area (3,600-4,100 m) early in the rainy season; coinciding with the appearance of the new low grasses and plants in moist areas.
and around ichu clumps. These plants all begin to dry up after the rain end. The animals spend the dry season at higher altitudes, between 4,100 and 5,200 m, where pasture can be found in the bofedales. This pattern of movement allows the animals and the herders to escape the hailstorms and heavy snows in the high country during the rainy season. The exposure to the hard, dry, rocky surfaces in the upper zones also lower the frequency of certain hoof diseases and parasites (Chuquibambilla, 1939:11; Moro and Guerrero, 1971: 54-56)”. But we should pay attention to the difference between this case and the cases of the Himalayas. Orlow says that the herders and their livestock go down in the rainy season (warm season) and go up in dry season (cold season), whereas in the Himalayas the cycle of the seasonal movement is reverse. I do not deny any possibility of seasonal pastoral movement in the Central Andes, as I have discussed the small scale of movement in the Puca’s case, for seeking more productivity of herding. I characterize the pastoralism in the Central Andes basically as sedentary, because ecologically it is possible to keep the livestock within a limited area in the plateau or valley heads stably throughout the year.

Khazanov discussed the typology of pastoralism of all over the world, analyzing the enormous ethnographic data (Khazanov, 1994). He proposed the five basic forms of pastoralism; Pastoral nomadism proper, Semi-nomadic pastoralism, Semi-sedentary pastoralism, Herdsman husbandry (distant-pasture husbandry) and sedentary animal husbandry. He mentions about the Andean pastoralism as the mountain variant of herdsman husbandry, because the majority of groups herding llamas and alpacas in the Andes combine pastoralism with agriculture (ibid.:68). I do not agree with his typology, because he classified the forms (especially the forms of movement) of pastoralism focusing on the ratio of pastoralism and agriculture. Though he says that there are mobile forms of agriculture, he puts in mind the forms such as the slash and burn type (ibid.:19), and he says “in the opposition between nomadism and sedentarism, according to which the essence of many of the forms of pastoral economy and its change is often defined, the agriculture at stake is one of the most important criteria”(ibid.: 25). In this work I emphasized the sedentarism of the pastoralism proper in the Andes, which is ignored by Kazanov. Considering the Andean pastoralism, many past common senses about pastoralism can be changed.

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