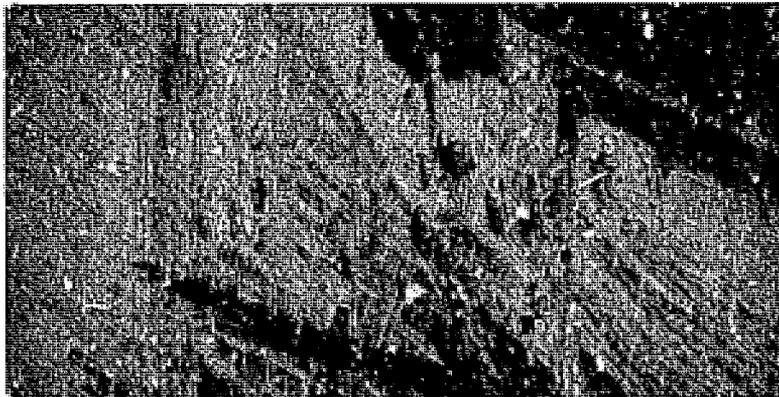


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**BASELINE SURVEY REPORT OF TWO ALPACA-  
PRODUCTION COMUNIDADES CAMPESINAS  
IN HUANCVELICA, PERU**

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## PREFACE

This project report of the Small Ruminant Collaborative Research Support Program (SR-CRSP) in Peru summarizes the main findings of a survey applied to alpaca, sheep, and llama producers of the comunidades campesinas of Santa Barbara and Orcobamba, in the puna of the department of Huancavelica, in central Peru. Baseline data emphasize alpaca herd composition, fiber production, and marketing channels.

The survey was carried out in the second half of 1980 using questionnaires designed by Domingo Martinez-Castilla. The surveys were conducted by Ing. Beatriz Santana, with support from the agricultural economics subproject of the SR-CRSP. The survey was coded by Edward Lotterman, Winrock's resident scientist in Peru during 1981 and 1982. Aldo Cruz-Soriano collaborated in the analysis presented in this paper.

A special acknowledgment is due to Dr. A. John De Boer, who did a complete revision of the drafts.

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## ABSTRACT

To describe the basic features of community-based alpaca-production systems, a survey was carried out in 1980 in two Huancavelica communities -- Santa Barbara and Orccobamba. Following are the major survey results. The number of animals owned per capita in these communities is similar to that found in a nearby sheep production cooperative. The ratio did not vary over different levels of stocking rate and family living conditions. The welfare level of Orccobamba comuneros is clearly below that of Santa Barbara; however, herd sizes in the former community are larger due to the absence of alternative sources of income. Orccobamba livestock herds have a higher proportion of other (i.e., non-alpaca) species, probably as a strategy for avoiding risk. The distribution of wealth, measured by alpaca herd size, is more variable in Santa Barbara. The herd composition, based upon age, sex, and fiber-color ratios, suggests higher levels of technical efficiency in Orccobamba. Fiber marketing in Orccobamba is more dependent upon middlemen linked to the large export firms.

**Keywords:** alpacas, Peru, peasant communities, sheep, marketing, producer survey

## INTRODUCTION

In the high-altitude Andean highlands (puna) of Peru, alpacas and llamas are often produced along with sheep and cattle, with the former becoming more important as the altitude increases. The puna permanent pastures comprise some 21 million hectares, 13 million hectares in the South and 6.5 million hectares in the Central Sierra. Even though sheep (15 million head in 1976) are the most widespread species in the puna, alpacas and llamas (some 3.8 million together) are very important in that they provide the poor man's meat and the major source of income for an important and impoverished population segment in the country. In addition, they provide fiber, are used as pack animals, and perhaps most important of all, are naturally adapted to the harsh climatic conditions of the puna.

Over 80% of alpacas and almost all llamas are tended by small-scale shepherds in traditional ways. Given the relatively favorable prices that their fiber now commands, producers are shifting resources into alpacas and researchers are paying more attention to studying the special characteristics of these livestock.

Thus, the economics component of the Peruvian SR-CRSP is involved with research in camelids, especially alpacas. This study presents survey results about alpaca production in the department of Huancavelica.

### Huancavelica

The department of Huancavelica is in the Central Sierra of Peru (figure 1) and has an area of 2.1 million hectares. Over 60% of this area is in natural pastures, almost all of which are in the puna region. Twenty-two percent of the department's GDP comes from agriculture. Annual per capita GDP was only US\$314 in 1981 (compared with US\$681 at the national level), and per capita agricultural GDP reached US\$70 in the same year (US\$79 for the country). The main productive activity, as in all Central Sierra departments, is mining.

The approximately 1.2 million hectares of puna natural grasslands of Huancavelica support 1.1 million sheep (7.2% of Peru's total), 230,000 alpacas (9.4%) and 145,000 llamas (10.7%). Also partially sharing the puna, but raised at lower levels including valleys and feeding mainly on crop residues and cultivated pastures, are 158,000 cattle (3.8%), 185,000 goats (9.12%), and other minor species (data from Martinez-Castilla, 1984).

Huancavelica constitutes the northern tip of the so-called "mancha india" (Indian spot), which includes the poorest and most traditional departments in the Sierra. Hence the importance that it has in terms of alpaca and llama production. It should be noted, however, that the most intensive zone of alpaca production is concentrated in a continuous tract of altiplano lands comprising parts of the departments of Puno, Arequipa, and Cusco.

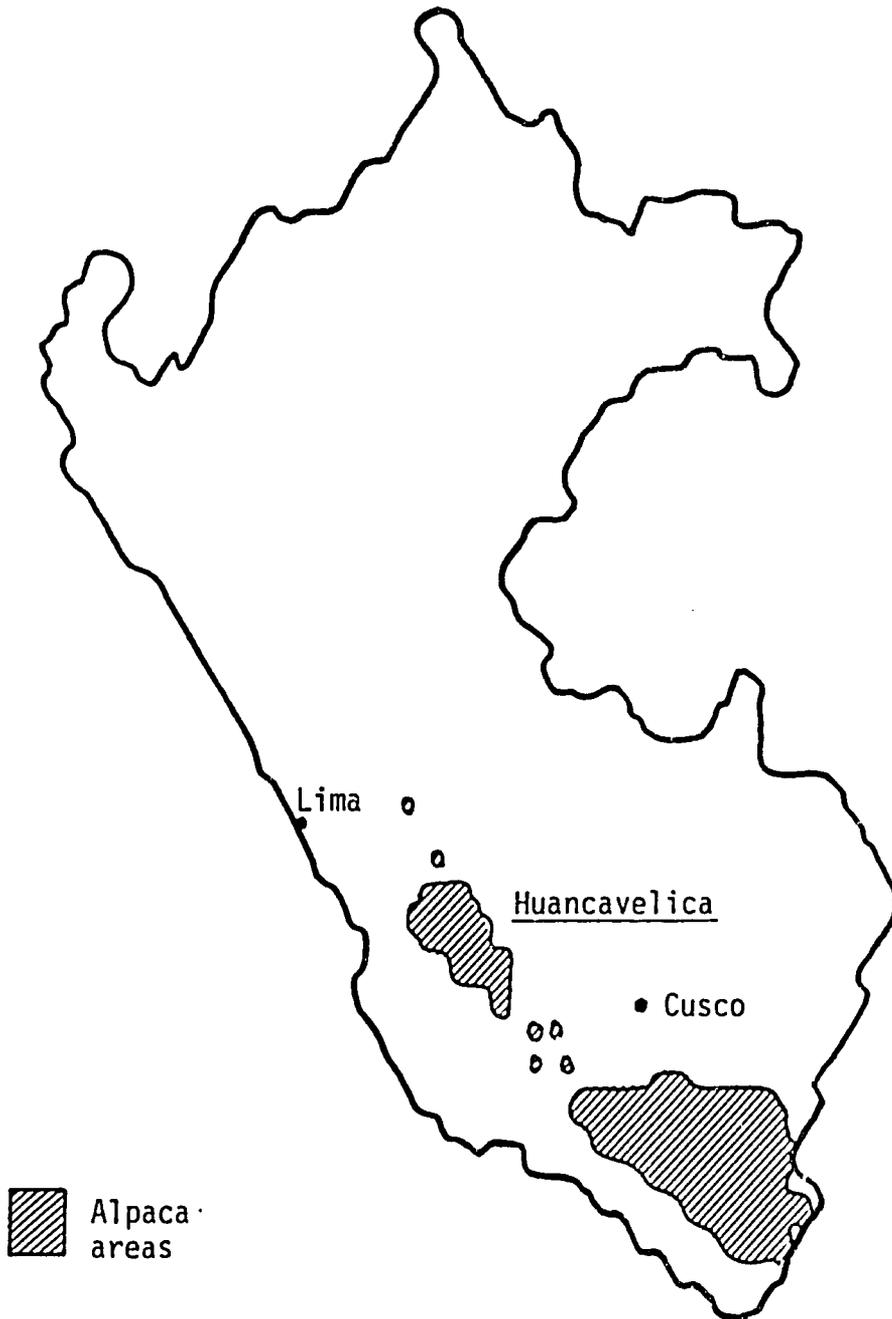


Figure 1. Location of Huancavelica in Peru.

Geographically, Huancavelica is located in an area where the Andes mountains and the Mantaro River produce an irregular landscape. The river has cut a deep canyon and the mountains rise very high, forming plateaus where natural grasslands prevail. Croplands are found in valleys and between the valleys and grasslands.

#### Urccobamba and Santa Barbara

Both Santa Barbara and Urccobamba are typical pastoral communities, particularly the latter community. General information about both communities is summarized in table 1.

Table 1. Basic data of Santa Barbara and Urccobamba communities.

Item	Santa Barbara	Urccobamba
Altitude (m)	4,000	4,400
Area (est. hectares)	23,000	13,000
Qualified comuneros	700	60
Population (est.)	3,000	300
Alpacas	10,000 <sup>a</sup>	10,000
Llamas	--	4,000
Sheep	8,000	8,000
Cattle	n.a.	300

Source: Information from comuneros.

<sup>a</sup> Author's estimate.

The village of Urccobamba is located 40 km west of the city of Huancavelica, at an altitude of 4,400 m. The pastures of the community are located between 4,400 m and 4,800 m. Most of the community land is very rough, with ravines, two high glacier mountains, two lakes, and some plains west of the village where most of livestock herding takes place. The estimated area of the whole community is around 13,000 ha, even though the comuneros reported over 30,000 ha. Except for wasteland, all the land may be considered as natural pastureland, even though isolated and small plots of papa chiri (bitter potatoes) are produced in warmer ravines and slopes. According to communal authorities, there are some 60 qualified comuneros, who with their families make a population of around 300 persons. The comuneros estimate the livestock in the community as follows: 10,000 alpacas, 4,000 llamas, 8,000 sheep, and less than 300 cattle. No vehicular roads are found in the community.

Santa Barbara is a community very close to the city of Huancavelica, with the central village 20 km from the city. Located at an altitude of 4,000 m, it has better lands than Urccobamba. Communal members reported that it extends over 23,000 ha that are managed by some 700 comuneros, who with their families make a population of around 3,000. Camelids number approximately 10,000, and there are also some 8,000 sheep.

Mining took place until the late 1970s, but today the mine is closed. Many members of the community work in the city of Huancavelica and others engage in commerce. The community is crossed by the highway that goes from Huancavelica to the provincial capital of Lircay.

Both communities use the land in the same way. Comuneros are assigned a small estancia around each family house. The estancia constitutes a rather small reserve of grass; occasionally crops are planted in small plots protected by adobe or stone walls. The rest of the land is common property that is used on a first-come, first-use basis, even though there seems to be a customary set of rules that limits the use of a given area to the neighboring families. It is possible to find several families' livestock herding together in the most favored areas.

Rules limit the number of animals that each family may graze in the commons. Usually the community will charge an annual per-head fee on the excess. Notwithstanding, there may also be an upper limit on herd size that no single comunero is supposed to exceed.

### **The Survey**

Between July and November of 1980, a survey of 152 families in both communities was conducted by two people experienced in working with comunidades campesinas of the zone. After selection, 108 questionnaires were completed for subsequent analysis. Comuneros were selected randomly, but they had to own some alpacas to be considered as survey subjects. Quantitative data analyzed included herd composition, family structure, fiber production and marketing, animal management, animal health, production facilities, and other relevant data. This paper presents a summary of the most important features found in the surveys.

### **LABOR USE**

Labor demand under the types of grazing systems in these villages is quite low. It is known that in agropastoral systems, livestock tending is left to the young while the most demanding crop tasks are undertaken by adults. In purely or almost purely pastoral systems like those found in Santa Barbara and Urccobamba, herding is the most important activity for all family members. Given that the herd usually has to be driven daily the long distance between the family house and the grazing fields, even the family head has to participate in this task. This does not preclude other activities being carried out at the same time.

Given the nature of extensive small-ruminant production, the quantity of labor used will tend to remain unchanged from year to year. Herd size, on the other hand, will change only over a longer period, and mainly as a consequence of natural biological growth and economic forces.

Thus, an analysis of production response to labor might be achievable only through the collection of historical data covering a relatively long period. Except for some cooperatives in Peru, that information does not exist today, and it would have to be analyzed taking into

account the influence of exogenous factors. An alternative to this difficult procedure is provided by cross-sectional analysis. In comunidades campesinas, written records for each family's stock either do not exist or are very difficult to gain access to. Thus, direct observation may be the best approach for collecting data.

Although there are many difficulties in measuring the actual physical quantity of labor used by community families in tending their herds, a methodological substitute may be found in the concept of family labor, since the family is the actual unit of labor in those production units.

For comparative purposes, the use of labor may be indirectly measured through the number of animals per family, even though family size may differ. Since a family's stock is not composed of animals of a single species, it should be standardized. In the Peruvian puna the most common unit used for this purpose is the unidad ovino (a standard sheep unit, SSU). This unit is based on estimated pasture consumption of each animal rather than on the quantity of labor involved in their care. In this work, approximate equivalences were used to carry out comparisons (see appendix for details).

Table 2 shows the ratio of SSU per family for both communities, which are also compared to two Agrarian Reform puna cooperatives to which subsequent references will be made for comparative purposes. (Those cooperatives are CAP "El Diezmo-Palcan" and SAIS "Ramon Castilla," in the neighboring departments of Pasco and Junin, respectively.) The ratios in that table show that average labor productivity in cooperatives (using a more modern technology and being capitalist-oriented firms) is greater than in comunidades campesinas. It is not possible to measure statistically the significance of the differences because the ratios in both cooperatives have been calculated on the basis of just one observation.

Table 2. Ratio of standard sheep units per family unit for selected communities.<sup>a</sup>

	Farm size	Sheep	Cattle	Alpacas	Llamas	TOTAL
Santa Barbara	3.6	63.06	3.19	178.81	19.86	264.83
Urccobamba	3.9	94.24	18.72	179.76	46.18	338.90
CAP "Diezmo-Palcan"	5.7	374.54	77.75	--	1.65	426.94
SAIS "R. Castilla"	n.a.	335.15	10.67	--	--	345.81

Source: Survey results and Martinez-Castilla, 1983b.

<sup>a</sup> All figures are expressed in standard sheep units (SSU), according to the conversion table in the appendix.

An additional element that could help in interpreting the results might be the average size of the family for each case. However, there are no data for SAIS Ramon Castilla. For the other cases, family numbers and

the results of calculating SSU per capita based on table 2 are as follows:

Santa Barbara	62 families	73.6 SSU per capita
Urccobamba	46 families	86.9 SSU per capita
CAP Diezmo-Palcan	20 families	74.9 SSU per capita

Differences are not as large as anticipated because the average family size in the cooperative is larger. The full meaning of these results will not be clear until more detailed studies are carried out, for it might prove important to know with more precision how many family members are actually engaged in herding. If no major differences are found, that would suggest that the ratio of sheep per capita is approaching a technical limit, reflecting that land area and quality are the main constraints for increasing total output from animals.

At this stage it is not possible to make any conclusions about levels of well-being of the people involved in either grouping. What is known, and there is strong evidence of this, is that productivity per animal is considerably higher in cooperatives (see, for instance, Gandolfo, 1980), probably as a consequence of management practices, breeds, and pasture quality.

## LIVESTOCK IN THE SURVEYED VILLAGES

### Herd Composition

In order to understand the differences between the small-ruminant production units for which data are available, table 2 presents a summary of those data for the two comunidades campesinas surveyed in Huancavelica. The figures correspond to sample averages because the peasant family, rather than the whole community, constitutes the actual production unit.

The results have been reduced to standard sheep units (see the conversion table in the appendix) in order to assess the relative importance of each species in the herd. It has to be emphasized that in the communities the herds are mixed, i.e., there is one herd for each family, and all three species are present. Cattle have not been accounted for because of their minor importance.

Total herd size is greater in Urccobamba than in Santa Barbara, due probably to the greater dependence of Urccobamba on livestock. The average alpaca flocks are similar for both communities, but there are more sheep and llamas in Urccobamba.

To better appraise the herd's organization in the communities of Santa Barbara and Urccobamba (and given the wide dispersion of data) the survey results have been grouped in five categories depending on the total number of alpacas per family. This method of grouping the data was used because of the importance of alpacas to the economic status of families in this zone of Peru. Table 3 shows the range for each category and the number of observations for each of them.

Table 3. Grouping of observations by number of alpacas.

Category	Range	Number of cases		
		Santa Barbara	Urccobamba	TOTAL
I	1-50	6	4	10
II	51-100	14	11	25
III	101-150	17	16	33
IV	151-200	14	9	23
V	Over 200	11	6	17
TOTALS		62	46	108

Source: Survey results.

On the basis of that grouping, tables 4 and 5 present the herd composition by species and category for Santa Barbara and Urccobamba, respectively. The average alpaca herd per family is 146 head for the former and 134 head for the latter, while the sheep flocks average 70 and 108 head, respectively. Llamas (including huarizos, the fertile offspring of llama-alpaca crosses) are more important in Urccobamba (average per family: 35) than in Santa Barbara (only 16 per family), reflecting the distance from highways and the consequent need for pack animals in Urccobamba. Thus, it may be said that animal husbandry in Santa Barbara tends to be more specialized than in Urccobamba. This is probably a consequence of the nonlivestock activities that may yield income for these comuneros.

Table 4. Santa Barbara: Average herd composition (head per family).

Category	Alpacas	Llamas <sup>a</sup>	Sheep	Cattle
I	43	8	18	0
II	77	5	22	1
III	131	17	71	0
IV	192	27	103	1
V	256	20	117	2
Sample	146	16	70	1

Source: Survey results.

<sup>a</sup> Includes huarizos.

Table 5. Urccobamba: Average herd composition (head per family).

Category	Alpacas	Llamas <sup>a</sup>	Sheep	Cattle
I	48	13	68	1
II	76	22	69	2
III	127	28	107	4
IV	173	59	128	6
V	254	53	180	8
Sample	134	35	108	4

Source: Survey results.

<sup>a</sup> Includes huarizos.

Cattle are not very important in either community, but nonetheless Urccobamba comuneros have an average of four head per family versus only one per family in Santa Barbara.

In summary, all comuneros have sheep and alpacas. Many also have llamas, especially in Urccobamba; only a few tend cattle, particularly in Urccobamba.

### The Alpaca Flock

Tables 6 and 7 present the average composition of the alpaca flocks for Santa Barbara and Urccobamba, respectively. Some differences arise because survey periods were different: for Santa Barbara in August and September, and for Urccobamba in October and November. This results in the almost total absence of alpacas less than 6 months old in Urccobamba, since camelids usually give birth during the first 2 to 3 months of the year. Male-to-female ratios have also been estimated, and they show that 0.33 adult male alpacas are tended for every female. In Santa Barbara, the ratio is considerable higher for the lowest income stratum (0.46).

Total alpaca numbers per family (146 for Santa Barbara and 134 for Urccobamba) are similar. However, distribution of wealth among the five defined categories seems to be different, as shown in table 8 and figure 2. In this table, both numbers of alpacas and sample sizes per community and per category have been used to estimate the use of the common pastureland by the different strata of comuneros. In Santa Barbara, the richer stratum (17.7% of the sample) holds more alpacas (31%) than any other stratum, while in Urccobamba the third stratum has more animals (34.8% of animals in the sample, 33% of the alpacas). There are no available figures on comuneros without alpacas, since only alpaca herders were selected for the sample.

Table 6. Santa Barbara: Average alpaca numbers by class (head)<sup>a</sup>.

Category	0 to 6 months				6 months to 2 years				2 to 6 years				Over 6 years				Breeding stock			Ratio Males/ Females	TOTAL ALPACAS			
	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Total		Male	Fem.	Cast.	Total
I	4	4	0	8	1	5	3	8	5	12	3	20	2	4	1	7	7	16	23	.46	12	24	7	43
II	5	10	0	15	3	8	4	15	6	19	7	32	3	12	1	15	9	30	39	.29	16	48	13	77
III	9	11	0	19	7	17	7	31	12	31	12	55	4	18	4	25	15	49	64	.32	31	77	22	131
IV	16	18	0	35	8	14	8	30	14	38	16	68	10	41	8	59	25	79	104	.31	49	111	32	192
V	21	26	0	46	13	33	15	61	20	48	23	92	12	34	11	57	32	83	115	.39	65	141	49	256
Sample	11	14	0	25	7	16	8	30	12	31	13	56	6	23	5	35	18	54	73	.33	35	85	26	146

Source: Survey results.

<sup>a</sup> Total sample size: 62 producers.

Table 7. Orccobama: Average alpaca numbers by class (head)<sup>a</sup>.

Category	0 to 6 months				6 months to 2 years				2 to 6 years				Over 6 years				Breeding stock			Ratio Males/ Females	TOTAL ALPACAS			
	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.		Total			
I	0	0	0	0	5	7	1	13	5	18	5	28	2	5	0	7	7	23	29	.30	12	29	6	49
II	0	0	0	0	8	11	2	22	8	22	8	37	2	13	2	17	10	34	44	.29	18	46	13	76
III	0	0	0	0	16	19	2	37	13	35	10	59	5	23	3	31	19	58	76	.32	34	77	16	127
IV	2	2	0	4	21	29	8	58	17	43	13	73	6	28	4	38	23	72	94	.32	46	103	24	173
V	1	2	0	3	26	33	4	63	24	75	19	119	15	42	13	70	39	117	157	.34	66	152	35	254
Sample	1	1	0	1	15	20	3	39	13	37	11	61	6	22	4	32	19	60	79	.32	35	80	19	134

Source: Survey results.

<sup>a</sup> Total sample size: 46 producers.

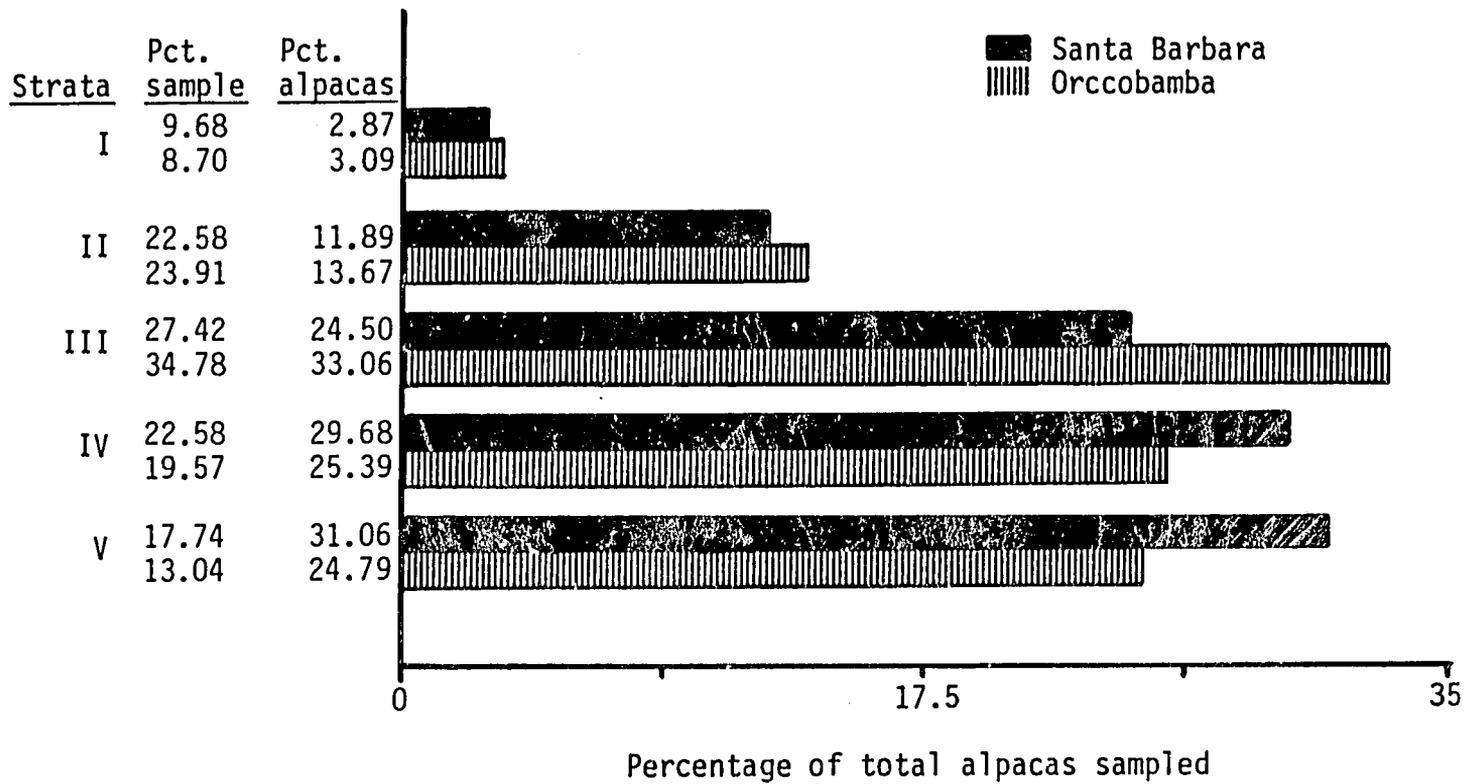


Figure 2. Distribution of alpaca numbers by income strata in Santa Barbara and Orccobamba. (Source: Table 8.)

Table 8. Alpaca ownership patterns in the sample.

Category	Santa Barbara		Urccobamba	
	Percentage sample	Percentage alpacas	Percentage sample	Percentage alpacas
I	9.68	2.87	8.70	3.09
II	22.58	11.89	23.91	13.67
III	27.42	24.50	34.78	33.06
IV	22.58	29.68	19.57	25.39
V	17.74	31.06	13.04	24.79

Source: Summarized from survey questionnaires.

Alpaca herd compositions were estimated on the basis of data from tables 6 and 7. The results are shown in tables 9 and 10. Young alpacas (less than 2 years old) are more important in Santa Barbara (37.4%) than in Urccobamba (around 30%), probably reflecting a greater mortality rate. That is also reflected by the proportion of breeding alpacas -- almost 50% in Santa Barbara and near 59% in Urccobamba. Castration is more frequent in Santa Barbara. However, as noted above, the male-to-female ratios are similar in both communities.

Within groups in both communities, only approximate assertions may be made because the samples were small. For example, older alpacas (over 6 years) seem to be more abundant in larger flocks. The opposite applies to alpacas ages 2 to 6 years. Regarding the other classes of alpacas, no clear tendencies are evident.

#### Importance of Alpacas Relative to Other Species

Tables 11 and 12 show results of correlating number of alpacas per family versus number of llamas plus huarizos, sheep, and cattle, respectively, for all five strata, and per community. Due to the small sample sizes, correlation coefficients are not significantly different from zero in most cases.

However, some preliminary conclusions may be drawn from those results. First, there seems to be a tendency to keep fewer llamas and huarizos as the alpaca flock grows larger. That is but a consequence of the greater attention that larger alpaca herders place on avoiding huarizos in the flock. As mentioned above, the crossbred camelids are fertile and thus may reduce the overall quality of the flock. Second, it is observed that llamas and huarizos, as well as cattle, are relatively more important in Urccobamba than in Santa Barbara, while the opposite is true for sheep. Finally, correlation coefficients for the whole communities are highly significant for llamas and huarizos, but not for cattle, revealing the marginal role of the latter species in the zone.

Table 9. Santa Barbara: Average composition of alpaca flocks (percentage).

Category	0 to 6 months				6 months to 2 years				2 to 6 years				Over 6 years				Breeding stock			TOTAL ALPACAS			
	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Total	Male	Fem.	Cast.	Total
I	8.85	10.0	.0	18.85	3.08	10.38	5.77	19.23	11.92	26.54	7.69	46.15	4.62	9.23	1.92	15.77	16.54	35.77	52.31	28.46	56.15	15.38	100
II	5.94	12.62	.37	18.92	3.34	10.48	5.47	19.29	8.26	24.12	9.46	41.84	3.25	15.31	1.39	19.94	11.5	39.42	50.93	20.78	62.52	16.7	100
III	6.71	8.19	.0	14.9	5.54	13.28	5.18	24.0	8.91	23.95	8.87	41.74	2.93	13.51	2.93	19.36	11.84	37.46	49.3	24.09	58.94	16.97	100
IV	8.44	9.55	.0	17.99	4.16	7.14	4.24	15.54	7.43	19.93	8.22	35.58	5.43	21.38	4.09	30.89	12.86	41.3	54.16	25.46	57.99	16.54	100
V	8.17	9.98	.0	18.15	4.97	12.89	5.86	23.72	7.95	18.89	8.95	35.8	4.55	13.35	4.44	22.34	12.5	32.24	44.74	25.64	55.11	19.25	100
Sample	7.64	9.73	.04	17.42	4.62	10.92	5.16	20.71	8.19	21.28	8.74	38.2	4.26	15.89	3.53	23.67	12.44	37.16	49.61	24.71	57.32	17.47	100

Source: Summarized from survey questionnaires.

Table 10. Orcohamba: Average composition of alpaca flocks (percentage).

Category	0 to 6 months				6 months to 2 years				2 to 6 years				Over 6 years				Breeding stock			TOTAL ALPACAS			
	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Cast.	Total	Male	Fem.	Total	Male	Fem.	Cast.	Total
I	.0	.0	.0	.0	11.05	14.21	2.63	27.89	10.53	36.84	10.53	57.89	3.68	10.53	.0	14.21	14.21	47.37	61.58	25.26	61.58	13.16	100
II	.0	.0	.0	.0	10.71	14.76	2.98	28.45	10.0	28.21	10.71	48.93	2.98	16.67	2.98	22.62	12.98	44.88	57.86	23.69	59.64	16.67	100
III	.05	.0	.0	.05	12.36	15.12	1.72	29.20	10.49	27.57	8.22	46.28	4.14	17.87	2.46	24.47	14.62	45.45	60.07	27.03	60.56	12.41	100
IV	1.22	1.28	.0	2.5	12.18	16.86	4.49	33.53	9.68	24.87	7.37	41.92	3.46	16.41	2.18	22.05	13.41	41.28	54.42	26.54	59.42	14.04	100
V	.33	.66	.0	.98	10.11	12.93	1.64	24.69	9.52	29.68	7.55	46.75	5.98	16.48	5.12	27.58	15.50	46.16	61.65	25.94	59.75	14.31	100
Sample	.41	.49	.0	.9	11.49	14.94	2.6	29.04	9.98	27.78	8.25	46.01	4.25	16.76	3.04	24.06	14.23	44.55	58.77	26.12	59.98	13.90	100

Source: Summarized from survey questionnaires.

Table 11. Santa Barbara: Correlation between alpaca numbers and other livestock populations.<sup>a</sup>

Category	Llamas and huarizos	Sheep	Cattle
I	.29	.11	.4
II	.41*	.0	-.27
III	.14	.44**	.37*
IV	.07	.27	.2
V	-.48*	.22	.22
Total	.37++	.64++	.2*

Source: Survey data.

a Significance Levels:

- \* Over 80%
- \*\* Over 90%
- + Over 95%
- ++ Over 99%

Table 12. Urccobamba: Correlation between alpaca numbers and other livestock populations.<sup>a</sup>

Category	Llamas and Huarizos	Sheep	Cattle
I	.13	-.68	-.58
II	-.26	.49*	.1
III	.13	-.17	-.57
IV	-.15	.42	.37
V	-.33	.06	.06
Total	.47++	.56++	.35+

Source: Survey data.

a Significance Levels:

- \* Over 80%
- \*\* Over 90%
- + Over 95%
- ++ Over 99%

## FIBER PRODUCTION AND MARKETING

### Distribution of Alpaca Colors

Alpacas are kept primarily because of the value of their fiber. White and the so-called light fawn fibers get prices 20% to 30% higher than do colored fibers. The difference is higher the farther the trading areas are from the central markets (Arequipa and Lima).

There are economic factors favoring white and light fawn over the other colors (the most common colors, besides white and light fawn, are black, brown in different tonalities, and grey). The reason given for preferring the clear colors (white and light fawn) is that they are easily dyed. However, when available in large lots colored fibers often fetch higher prices at the international market. Thus, the low farm prices may be due to the selection costs implied because colors are not uniform and may even be mixed on the same animal. In conclusion, alpaca raisers prefer white animals, and some efforts are being made to select for that color.

Tables 13 and 14 show the percentage distribution of alpaca colors for Santa Barbara and Urccobamba, respectively (see also figure 3). White alpacas in Santa Barbara (36.9%) are noticeably less important than in Urccobamba (61.95%). However, white alpacas seem to be proportionally more abundant in the higher-income strata of Santa Barbara, while in Urccobamba, all strata have very close to 60% white alpacas. Once again, an explanation for this may be the greater dependence on animal husbandry Urccobamba comuneros have, making it necessary for them to be more careful in selecting their animals. Since Santa Barbara comuneros have other sources of income, alpacas for them may be but an additional source of income, or a sort of insurance and retirement fund.

Table 13. Santa Barbara: Percentage distribution of alpacas by color of fiber.

Category	White	Light fawn	Other color
I	25.0	7.5	67.5
II	28.47	8.54	62.99
III	34.21	8.88	56.91
IV	51.77	11.35	36.88
V	38.8	9.3	51.9
Total	36.9	9.32	53.78

Source: Survey results.

Table 14. Urccobamba: Percentage distribution of alpacas by color of fiber.

Category	White	Light fawn	Other color
I	60.49	6.17	33.33
II	61.99	6.33	31.67
III	62.91	5.96	31.13
IV	62.22	6.67	31.11
V	60.0	6.67	33.33
Total	61.95	6.31	31.75

Source: Survey results.

### Production of Alpaca Fiber

As shown in tables 15 and 16, average fiber production per alpaca is higher in Urccobamba (4.97 lb per shorn alpaca) than in Santa Barbara (4.71 lb), corroborating the explanation given above. Also, yields in Urccobamba do not change among strata as much as they do in Santa Barbara. It is not easy to compare those yields with other zones and types of ranches, because frequency of shearing may range from every 12 to every 24 months, depending on factors ranging from management practices to need for money.

Table 15. Santa Barbara: Production of alpaca fiber.

Category	Total lbs	Shorn alpacas	Lb per alpaca
I	291	51	5.71
II	690	171	4.04
III	2,617	585	4.47
IV	2,350	550	4.27
V	2,233	380	5.88
Total	8,181	1,737	4.71

Source: Survey results.

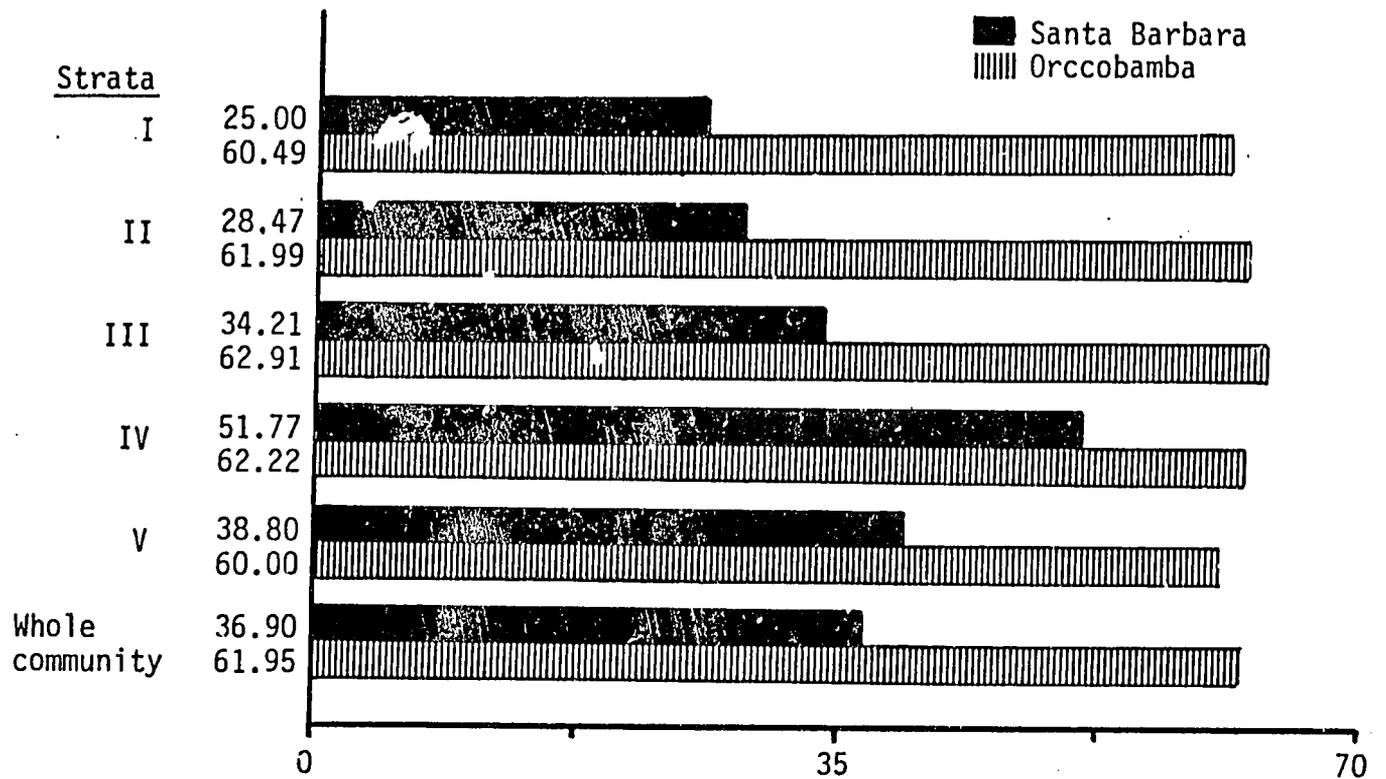


Figure 3. Proportion of white alpacas in Santa Barbara and Orccobamba. (Source: Tables 13 and 14.)

Table 16. Urccobamba: Production of alpaca fiber.

Category	Total lbs	Shorn alpacas	Lb per alpaca
I	225	45	5.0
II	1,010	200	5.05
III	2,570	510	5.04
IV	1,907	380	5.0
V	1,630	340	4.79
Total	7,335	1,475	4.97

Source: Survey results.

### Destination of Alpaca Fiber

The importance of the distance to urban markets is evident when the end use of alpaca fiber is compared for both communities. Urccobamba comuneros, farther from any important collection center, have to rely more on the rescatistas, or fiber collectors, who usually are closely linked to the handful of firms that export the bulk of alpaca fiber (Velarde, 1984). That may be an additional explanation of why Urccobamba flocks are "whiter" than Santa Barbara's. Comuneros of the latter community have more access to smaller collectors, not necessarily linked to the big exporters, who operate in the nearby city of Huancavelica. Many of these collectors prefer nonwhite fiber because an important portion of the fiber they buy is subsequently sold to weavers and other craftsmen who make extensive use of nonwhite fiber. For instance, the artisans of Hualhuas, a village close to Huancayo, are supplied almost exclusively with colored alpaca fiber from Huancavelica.

Four "means of disposition" (two main market channels and two main end uses) have been determined:

- Middlemen -- the rescatistas visit different comunidades campesinas collecting alpaca fiber. They have storehouses where some selection is done. Afterwards, the fiber is shipped to the factories of the exporting firms where the fiber is sorted again, washed, and converted into tops and slivers, the most frequent forms in which alpaca fiber is exported.
- Local markets -- either village ferias or established merchants in larger towns. The local markets in larger towns are usually merchants in the city of Huancavelica.
- Domestic use -- fiber destined to make fabrics, sacks, ropes, and other objects intended for household use.
- Handicrafts -- fiber to be used in different crafts intended for exchange for money or products.

Tables 17 and 18 show the summary survey results for the means of disposition of the alpaca fiber. Urccobamba comuneros sell over 87% of their fiber to middlemen (rescatistas) that go from village to village, and even from ranch to ranch, collecting fiber in exchange for money or in some cases other products needed by the family. In Santa Barbara that figure is almost 10% lower. Selling to local markets (either ferias or buyers established in the city of Huancavelica) is conversely more important in Santa Barbara (10%) than in Urccobamba (only 2.45%, but coming from only one herder out of 46 in the sample). Household consumption and handicrafts are also more important uses for alpaca fiber in Santa Barbara than in Urccobamba.

Table 19 shows the proportion of comuneros in the sample and in both comunidades campesinas that sell or use fiber in one of the four ways described above. In the case of alpaca fiber in Urccobamba, 97.83% (all but one) sell their fiber to middlemen, while in Santa Barbara, that percentage is 93.55 (all but four).

Fourteen Santa Barbara comuneros (22.58%) sell their fiber to local markets, while only one uses that marketing channel in Urccobamba. Besides this, no other important differences are present regarding alpaca fiber.

The differences between the two communities are clearer in the uses of llama hair and sheep wool. While in Santa Barbara the few llama owners use the hair mainly for handicrafts, that activity is totally absent in Urccobamba, where almost 90% of the sampled comuneros sell the hair to middlemen. In the case of sheep wool, domestic use is widespread in both communities, but besides that, almost 90% of Urccobamba comuneros sell wool to middlemen, while only 5% do so in Santa Barbara.

## **SUMMARY AND CONCLUSIONS**

A survey of 152 families in two communities in the department of Huancavelica serves as the basis for this report. The objective of the survey was to gather and analyze baseline socioeconomic and technical information about village-based alpaca-production systems. The limited number of useful questionnaires completed (108) restricted the types of statistical analysis that could be carried out.

The survey found that altitude and distance from major market centers influenced:

- the relative importance of alpaca production compared to overall agricultural activities
- the composition of the alpaca flock
- the mix of animal species (alpacas, llamas, sheep, and cattle) held
- labor use in herding activities
- distribution of fiber colors represented in the alpaca flocks

Table 17. Santa Barbara: Distribution of alpaca fiber (percentage) by means of disposition.

Category	Middle-men	Local market	Household consumption	Handicrafts
I	89.35	.0	2.75	7.9
II	63.04	15.94	10.14	10.87
III	85.59	3.86	4.59	5.96
IV	82.98	2.13	7.45	7.45
V	63.14	25.08	5.73	6.05
Total	76.95	10.04	6.12	6.89

Source: Survey results.

Table 18. Orccobamba: Distribution of alpaca fiber (percentage) by means of disposition.

Category	Middle-men	Local market	Household consumption	Handicrafts
I	95.56	.0	2.22	2.22
II	87.13	.0	6.93	5.94
III	90.27	.0	4.86	4.86
IV	80.53	9.47	5.0	5.0
V	92.02	.0	3.99	3.99
Total	87.87	2.45	4.91	4.77

Source: Survey results.

Table 19. Means of disposition for alpaca fiber used by comuneros in the sample.<sup>a</sup>

Product	Middlemen		Local markets		Domestic use		Handicrafts	
	S. Barb.	Orcco.	S. Barb.	Orcco.	S. Barb.	Orcco.	S. Barba.	Orcco.
Alpaca fiber	93.55	97.83	22.58	2.17	80.65	86.98	88.71	86.96
Llama hair	3.23	89.13	.0	2.17	.0	4.35	17.74	.0
Sheep wool	4.84	89.13	.0	.0	64.52	95.65	62.9	95.65

Source: Survey results.

Sample sizes: Santa Barbara -- 62  
Orccobamba -- 46

The community (Santa Barbara) that had more agricultural activities and more sources of nonagricultural income had almost only alpacas and sheep. The more remote pastoral community (Urccobamba) had all four major species (alpacas, llamas, sheep, and cattle). Average herd sizes for sheep and alpacas were larger in Urccobamba, but the overall economic status of families was lower, indicating that productivity and income from livestock were not high enough to compensate for income added from crop production and nonagricultural activities in Santa Barbara. Most alpaca flocks held per family contained from 50 to 200 head, with 100 to 150 head being the most common size. White fiber is more prevalent in Urccobamba (62%) than in Santa Barbara (37%), due probably to market demand and final use of fiber.

This study indicated some of the key issues facing the SR-CRSP in working with pastoral-based high-altitude communities. Items that were found to strongly influence alpaca-production-and-marketing systems (isolation, altitude, human population densities) cannot be influenced by the SR-CRSP. However, other aspects such as reproduction, animal selection, and animal mortality problems do form a relevant set of research topics for the SR-CRSP.

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## APPENDIX

### EQUIVALENCES OF SMALL RUMINANTS IN STANDARD SHEEP UNITS (SSU)

Species and Class	Equivalences (SSU)
<b>SHEEP</b>	
Adult	1.0
Young	.5
<b>ALPACAS</b>	
Adult	1.5
Young	.5
<b>LLAMAS</b>	
Adult	1.5
Young	.5

Note: These values are very rough approximations used solely for comparative purposes. These equivalences will change according to the breeds, ages, and weights of the animals.