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NORTH CAROLINA UNIVERSITY
AGRICULTURAL MISSION
TO PERU

COMMENTS ON AGRICULTURAL MARKETS, TRADE,
AND PRICES IN THE CUZCO SIERRA REGION OF PERU

by

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Note to Reader:

These notes were prepared while the author was a visiting professor in the
Faculty of Social Sciences at the Universidad Agraria, Lima, Peru. The reasoning
presented here was used to develop a set of projected prices which will be
contained in the author's Ph.D. dissertation to be submitted to the Department
of Economics, North Carolina State University, Raleigh. Readers are cautioned
that these notes are very tentative and are subject to future revision and
modification.

The List of References and Appendix Tables have been taken from a review
draft of mimeographed notes by the author entitled "Estimated Costs, Yield, and
Resource Requirements for Crops and Livestock for the Cuzco Sierra Region of
Peru."

The purpose of reproducing these notes is two-fold: (1) They may provide
useful summary information relative to price trends in the Southern Sierra of
Peru and (2) they may stimulate others to develop a set of projected agricultural
prices which could and should be used in planning research.

Introduction

One of the basic characteristics of traditional agriculture is the low
percentage of agricultural products that enter into the marketing system. As
the dependence on subsistence production decreases and regional specialization
and trade expands, the time, form, and space relationships between market prices
become more relevant. Prices prevailing before the transformation may not
necessarily be reliable indicators of those that will follow. The alternative
price relationships expected to prevail in the Cuzco region as the transformation
proceeds are developed in these notes.

Trade Flows

The trade flows and routes of selected commodities in the southern Sierra region for 1957 are presented in Table 3.1. The major exports from the Cuzco department are livestock, tropical crops (coffee, tea, coca) from the Selva region, and wool. Some grains are exported to the coast via Puquio. Generally, however, the region is a net importer of grains. Grains accounted for 32% of the imports into the southern Sierra region from Arequipa. This figure does not represent normal conditions as 1957 was a poor agricultural year and emergency imports were required.

The major market outlets for the exports from the Cuzco region are Lima (cattle and tropical products), Puno (cereals and tubers), and Arequipa (wool, cattle, and tropical products). Imports are primarily non-agricultural products coming through Arequipa.

Market Centers

The two major market centers in the Cuzco department are the cities of Cuzco and Sicuani. Practically all the imports or exports of the Cuzco department must pass through either one or both of these cities. An exception is the slight flow from Santo Tomás and Yauri directly to Arequipa. Initially it was decided to

Table 3.1. Flows of selected agricultural products along major transportation routes for Southern Peru for 1957[a]

Route	Origin (Principal supply region)	Destination	Total Metric Tons
Quillabamba to Cusco by rail	Quillabamba, Lares, Alto, Urubamba Valleys	Cusco, Arequipa, Lima and export	25,675
Cuzco to Quillabamba by rail	Coast and Southern Sierra	Quillabamba, Lares, and Alto Urubamba Valleys	15,648
Abancay to Huanta by road	Cuzco and Abancay Departments	Central Sierra and Lima	11,173
Huanta to Abancay by road	Lima and Central Sierra	Cuzco and Abancay Departments	17,373
Cuzco to Puquio by road	Cuzco and Abancay Departments	Lima	12,554
Puquio to Cuzco by road	Lima	Cuzco and Abancay Departments	15,187
Puno to Arequipa by road and rail	Cusco and Puno Departments	Coast and exports	126,521
Arequipa to Puno by road and rail	Lima and Southern Coast and imports	Puno and Cuzco Departments	302,778
Arequipa to Lima by road	Southern Sierra and Coast	Lima and Central coast	89,548
Lima to Arequipa by road	Lima and Central Coast	Southern Sierra and coast	116,778

[a]Adapted from Plan del Sur (1959, PS/E/45, p. 81).

Table 3.1 continued

Coffee	Coca	Fruits and vegetables	Livestock	Grain	Wool	Potatoes	Misc. Agr. products	Non-agr. products	Total
8	22	27	0	4	0	0	0	39	100
0	0	0	0	0	0	0	10	90	100
0	12	0	26	0	0	0	31	31	100
0	0	0	0	5	0	0	0	95	100
11	0	0	46	5	0	0	16	22	100
0	0	0	0	0	0	0	0	100	100
0	0	0	28	0	2	0	0	70	100
0	0	0	0	32	0	3	4	61	100
0	0	0	20	0	2	0	30	48	100
0	0	0	0	2	0	4	12	82	100

allocate the twelve Sierra provinces in the Cuzco Department into two marketing regions—one corresponding to those provinces whose transfer costs were lowest to Cuzco and the other to those provinces whose transfer costs were lowest to Sicuani. However, the corresponding sets of derived prices for the two sub-regions differed by less than 10%. Therefore, it was decided to combine both market regions into one region and use the set of derived prices corresponding to those for Cuzco.

Transfer Costs

Transfer costs between selected cities for crops, sheep, cattle, and wool are given in Appendix B, Tables 1, 2, 3, and 4. These transfer costs were adapted from Mathia (1965) and unpublished railroad fares. They correspond to the least-cost route and mode of transport. As mentioned above, the intra-regional transfer costs for selected commodities were calculated by weighting the transfer costs from each province capital to its least-cost market outlet (Cuzco or Sicuani) by the relative percent of the total volume sold in the region according to the data given in Plan del Sur[1](PS/G/59, pp. 185-259). However, since it was decided to combine the Cuzco and Sicuani markets into one region, the intra-regional costs corresponding to Cuzco were used. Therefore, the actual intra-regional transfer costs given in Appendix , Table 5, correspond to the weighted averages of the shipping costs between Cuzco and the province capitals Anta, Calca, Cuzco, Paruro, Paurcartambo, Urcos, and Urubamba.

Commodity Prices

Three major problems were encountered in developing a consistent set of farm prices for the various commodities. The first problem was to determine the existing level of prices. The second problem was to estimate what effects increases or decreases in production would have on the existing prices. The third was to determine how the on-farm prices would change due to increased marketing efficiency.

[1] The Plan del Sur study is given as the Interamerican Cooperative Service of Southern Peru in the List of References.

Prices reported at several different levels of the marketing system have been utilized to develop the set of prices used in this study. Generally, the most reliable data are those for the Lima Mercado Mayorista (wholesale market) and import-export prices. Published on-farm prices and retail prices for other cities are subject to much greater error for several reasons. First, no consistent price reporting system exists. Prices are "volunteered" on a piecemeal basis by various technicians working for the Ministry of Agriculture. Second, local provincial governments frequently establish a list of "official" prices which are the ones that are normally reported but often are unrelated to prevailing prices. Third, the market system is not organized. In many rural locations goods are interchanged with other goods and no monetary prices are established. Fourth, a high proportion of certain crops are retained for farm consumption and never enter into the market system (Table 3.2). Fifth, it is alleged that certain "middlemen" are in a monopolistic position, particularly in the smaller cities and rural areas, and that they are able to manipulate prices.

No estimates of price elasticities of demand were available.[1] Since the Cuzco department produces less than 10% of most of the individual commodities, changes in its output probably would not affect country-wide prices to any significant degree. Therefore, attention was primarily focused upon considering the best alternative markets for the Cuzco department when it was a net exporter and when it was a net importer of a particular commodity. The basic assumption was that the demand for a particular commodity was perfectly elastic up to the point of regional self-sufficiency (QQ, Figure 3.1). When regional self-sufficiency was reached, the price drops (P_2 to P_1) by the amount equal to the transfer cost to the best alternative market.

[1] A preliminary set of income elasticities are presented in Coffey (1965).

Table 3.2. Estimated percentage of the volume of selected crop and livestock products that are retained for family consumption and seed in Cuzco Department, 1957[a]

Item	Percentage
Broad Beans	—[b]
Potatoes	80
Corn	76
Wheat	66
Quinua-Canihua	100
Barley	78
Meat from all livestock	25
Milk, cheese, and butter	5
Sheep, alpaca, llama, etc. wool	46

[a]Adapted from Plan del Sur (PS/G/1959, pp. 184-264).
[b]Data not available but is probably near 95%.

Price

level of self sufficiency
(zero imports)

P_2

transfer cost

P_1

O

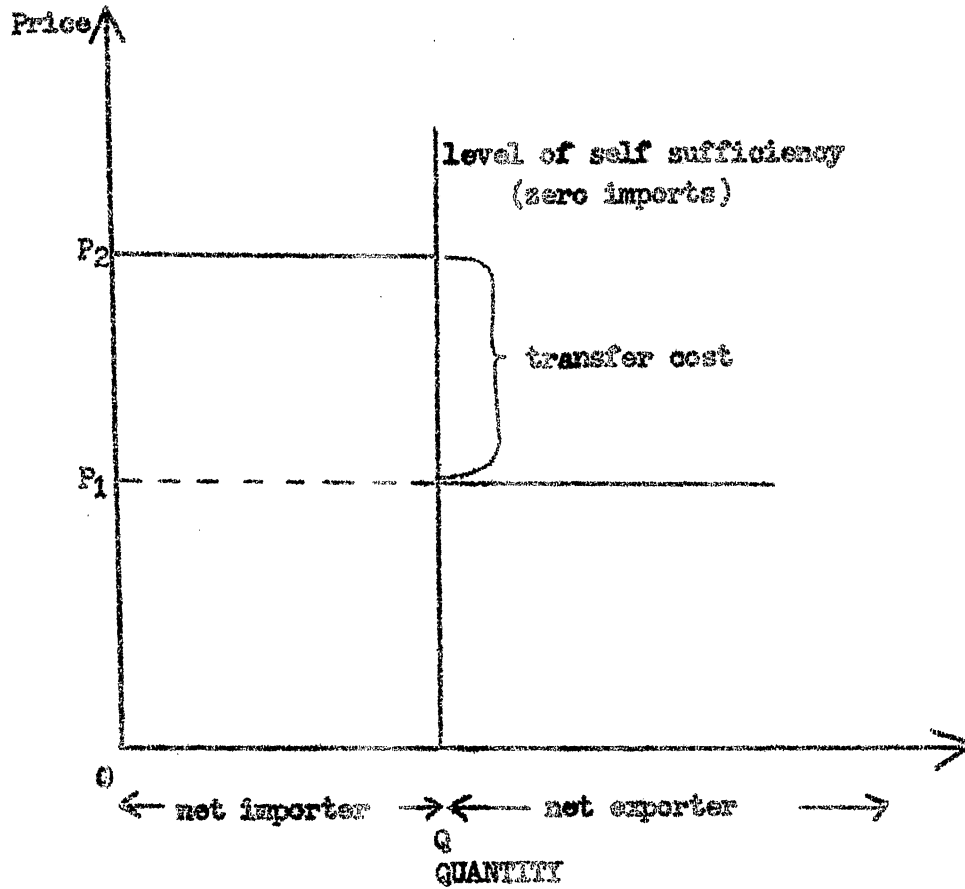← net importer → ← net exporter →

Q

QUANTITY

Figure 3.1. Hypothetical regional demand curve for a commodity under
conditions of net imports and net exports.

The transportation costs explained in the previous section were used to derive on-farm harvest-time prices for the Cuzco region. When monthly prices were available, the non-farm prices during the Cuzco harvesting season were used so as to reduce the price differential due to time utility. Adjustments were made in the enterprise budgets for the other marketing costs such as sacks, sorting, classifying, and field to farmstead hauling.

In the subsections that follow, a brief analysis of the individual commodity prices are given. The price ranges for each of the commodities are presented in Table 3.24 at the end of this chapter.

Wheat: Peru imports over twice as much wheat as she produces (Table 3.3). Wheat prices are, therefore, strongly influenced by imports. According to Hidalgo and Jibaja (1964), in 1964, a governmental decree established that the delivered mill price of domestic wheat at CIF Lima import price plus transportation cost from Lima to the mill with certain minor adjustments for quality and weight differentials. This should tend to increase the prices received by farmers.

Wheat is one of the basic subsistence crops of Cuzco. Some 66 percent of it is retained on the farm for consumption and seed (Table 3.3). Deflated wheat import prices decreased during the 1958-64 period and stabilized at S/.2.21 per kilogram (Table 3.4).[1] Lima wholesale prices during the May-July period, which corresponds to the harvest period in Cuzco, have ranged from S/.0.33 to S/.1.02 above import prices.

Retail wheat prices given in Table 3.5 have declined from 1958-62 to 1963.[3] The 1963 Cuzco and Sicuani prices are fairly close to those given for Lima. Wholesale-retail prices appear to be near S/.3.00 per kilo.

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[1]Appendix Table 7 contains conversion rates of soles per kilogram to dollars per pound and bushel which may be convenient for readers unaccustomed to the units used here.

Table 3.3. Barley, wheat and beef imports and sheep and alpaca wool exports compared to total production for Peru for 1959-63[a]

Year	Percent quantity imported is of total production			Percent quantity exported is of total production	
	Barley	Wheat	Beef[b]	Sheep wool	Alpaca wool[c]
			(percent)		
1959	9	207	11	40	111
1960	7	235	4	22	82
1961	7	278	12	15	101
1962	8	272	33	34	99
1963	12	233	45	41	130

[a]Adapted from Convenio de Cooperacion Tecnica (1964, pp. 114-152).
[b]Includes only meat exclusive of entrails, livers, etc.
[c]Includes llama and huarizo wool which accounts for approximately 10% of exports. Figures are distorted due to stock carryovers.

Table 3.4. May-July Lima wholesale prices and average annual import price of wheat 1958 to 1964[a]

Year	Lima wholesale[b] May-July	Average annual[c] import price
	(1964 soles per kg.)	
1958	3.34	2.71
1959	3.12	2.78
1960	2.67	2.34
1961	2.70	2.29
1962	2.93	2.21
1963	3.23	2.21
1964	2.90	---

[a]All prices converted to 1964 soles by deflating by wholesale price given in Appendix Table 8.
[b]Adapted from Ministerio de Agricultura (1963) and (1964).
[c]Adapted from Estadistica del Commercio Exterior (1958 to 1963).

Table 3.5. Average annual retail prices of selected crops for five southern
Peru cities for 1958-62 and 1963[a]

Cities and Year	White Potatoes	Yellow Corn	Dry Broad Beans	Wheat
	(soles per kilo)[b]			
Abancay				
1958-62	1.90	3.49	3.18	2.47
1963	—	—	—	—
Cuzco				
1958-62	2.02	3.43	3.25	3.36
1963	1.85	4.32	3.20	3.22
Arequipa				
1958-62	2.13	2.23	5.38	—
1963	2.10	1.68	5.03	—
Puno				
1958-62	—	—	—	—
1963	2.28	4.58	—	—
Sicuani				
1958-62	2.09	3.64	2.66	3.18
1963	1.75	3.73	2.78	2.96
Practical range[c] Southern Sierra				
1958-62	1.37—2.68	2.24—3.75	2.33—4.97	2.47—3.49
1963	1.85—3.26	2.84—4.59	3.11—3.82	2.96—5.50

[a]Adapted from Ministerio de Agricultura (1964), "Precios Promedio de
Productos Agropecuarios Años 1953 a 1957, 1958-1962 comparados con 1963.
Segun informacion de Concejos Provinciales Colobaradores."
[b]Prices deflated by wholesale price index (1964 = 100) given in
Appendix , Table 8.
[c]Range between next to lowest and next to highest prices for cities
in the southern sierra region for which prices were reported.

The on-farm harvest time wheat prices given in Table 3.6 are lowest for 1963 and highest for 1964. The 1964 Arequipa price of S/.1.10 was abnormally low and is probably erroneous. The practical range for coastal and sierra departments has generally hovered within S/.0.40 of S/.2.00.

Using the transfer costs given in Appendix Table 4, the estimated price at which Cuzco could import wheat from Lima is S/.3.19 (2.21 + 0.98). This price less the intra-regional transfer cost from Appendix Table 5, results in a derived farm price of S/.3.12 (3.19 - 0.07).

If wheat production in the Cuzco department surpassed the self-sufficiency level, it would most likely be exported to the cities of Puno and Arequipa. These two cities could obtain imports from Lima at S/.3.02 (2.21 + 0.81) and S/.2.79 (2.21 + 0.58), respectively. The net derived price for Cuzco producers shipping to these markets would be S/.2.70 (3.02 - 0.25 - 0.07) for Puno and S/.2.30 (2.79 - 0.42 - 0.07) for Arequipa.

It appears, therefore, that Cuzco wheat prices will lie in the S/.2.30 to S/.3.12 price range. The average expected price is S/.2.70. Since Peruvian consumers appear to be sensitive to bread price increase, the government will probably continue to import considerable quantities/of wheat to prevent increases in bread prices.

Potatoes: Both yellow and white potatoes are grown in the Cuzco region. The yellow potato is grown almost exclusively for on-farm consumption by the indigenous farmers. Potato research has been primarily on the white varieties. Little is known about fertilizer response and yield potential of the yellow potato. This analysis is restricted to white potatoes.

The following factors were considered in deriving white potato prices for Cuzco. First, the Cuzco department is the major producer of potatoes in the Southern Peru region. Its principal market outside its departmental boundaries are the cities of Arequipa and Puno. Second, in the southern Peru region, Cuzco is probably the only department that has net exports of potatoes.

Table 3.6. Average on-farm harvest-time prices and ranges for selected crops for Cuzco, Apurimac, Arequipa, and Puno departments for 1962, 1963, and 1964[a]

Department and Year	White Potatoes	Yellow corn	Both green and dry broad beans	Quinua	Wheat	Barley
		(1964 soles per kilo)[b]				
Cuzco						
1962	1.46	2.70[d]	2.70	---	2.15	1.29
1963	1.29	2.76[d]	1.97	3.15	1.89	1.58
1964	0.95	3.10[d]	3.00	3.65	2.40	1.74
Apurimac						
1962	---	2.08	---	---	2.85	---
1963	1.58	2.14	---	---	1.89	1.58
1964	1.68	2.25	---	3.65	2.72	1.70
Arequipa						
1962	1.65	2.75	---	---	1.79	---
1963	1.73	2.08	---	---	1.89	1.73
1964	1.66	2.17	2.00	---	1.10	1.90
Puno						
1962	1.86	---	2.81	2.48	2.34	1.47
1963	1.47	---	2.28	2.17	---	1.79
1964	1.48	---	1.58	2.53	---	1.75
Practical range[c] for coastal and sierra departments						
1962	1.08—1.86	1.36—2.70	1.46—2.81	---	1.67—2.34	1.12—1.47
1963	1.16—1.97	1.58—2.76	1.58—2.28	2.89—4.03	1.58—2.16	1.16—1.73
1964	1.15—2.00	1.58—2.94	1.67—2.42	2.53—3.00	1.70—2.72	1.10—1.75

[a]Adapted from Ministerio de Agricultura (1964) Estadísticas de los precios de Productos Agrícolas "En Chacra".

[b]Prices deflated by Wholesale Price Index (1964 = 100) given in Appendix Table 8.

[c]Range between next to lowest and next to highest prices prevailing in all departments for which prices were reported excluding the tropical departments of Amazonas, San Martin, and Madre de Dios.

[d]Probably biased upward due to inclusion of white corn prices.

Third, Lima, is the single largest potato consuming center and farm prices prevailing in other cities are related to the Lima price. Fourth, potatoes grown in the coastal region reach the Lima market from August to December, while those from the Sierra arrive from March to June.

April to June white potato prices in the Lima wholesale market have varied between S/.2.17 and S/.1.63 per kilogram during the 1958-64 period with the 1958-61 prices being higher than the 1962-64 prices (Table 3.7). Similarly, the 1963 retail prices given in Table 3.5 were lower than the 1958-62 averages.

The practical range for coastal and Sierra departmental on-farm prices was between S/.1.08 and S/.2.00 from 1962 to 1964 (Table 3.6). The 1964 average for the Cuzco department of S/.0.95 is the lowest. Cuzco farm prices have been consistently lower than those in the other three departments. That both retail and farm prices are lower in Cuzco and Sicuani than Arequipa and Puno is consistent with the observations made to the author that the Cuzco department usually exports some potatoes to Puno and Arequipa.

Table 3.8 contains derived on-farm prices for the Cuzco region based upon 1963 wholesale and retail prices. These derived prices were obtained by subtracting or adding the appropriate transfer costs from the various retail and wholesale prices. Both exports to and imports from Lima result in prices considerably outside the practical range of on-farm prices given in Table 3.6. Consequently, it does not appear that Cuzco would be able to compete in the Lima market. The remainder of the derived prices appear to be consistent with price expectations. They are, however, at least S/.0.27 per kilogram higher than the Cuzco department on-farm average price for 1963. It appears that the 1964 average on-farm price in Cuzco was abnormally low although the appropriate retail prices are not available to test this.

Table 3.7. Average harvest season prices of selected crops in Lima wholesale market 1958 to 1964[a]

Year	White potatoes (Apr–Jun)	Yellow corn (May–Jul)	Dry Broad Beans (May–Jul)	Quinua (May–Jul)
		(1964 soles per kilogram)		
1958	2.17	3.45	5.97	6.08
1959	2.10	2.50	4.31	4.22
1960	1.97	2.18	3.76	3.90
1961	2.10	2.37	4.61	8.67
1962	1.63	2.14	4.64	7.53
1963	1.82	2.28	5.39	6.30
1964	1.97	2.39	5.82	5.87

[a]Adapted from Ministerio de Agricultura (1963), (1964), and Cultivos, Cosechas y Mercados, July, 1964. Prices deflated by Wholesale Price Index (1964 = 100) given in Appendix Table 8.

Table 3.8. Derived on-farm white potato prices for Cuzco region for alternative market situations[a]

Basis for Price	Derived farm price[a]
	(soles per kilogram)
1963 export to Lima	0.76 (1.82 – 0.98 – 0.08)
1963 export to Puno	1.95 (2.28 – 0.25 – 0.08)
1963 export to Arequipa	1.60 (2.10 – 0.42 – 0.08)
1963 export to Cuzco	1.77 (1.85 – 0.08)
1963 export to Sicuani	1.56 (1.75 – 0.11 – 0.08)
1963 import from Lima	2.72 (1.82 + 0.98 – 0.08)

[a]Calculated by subtracting or adding the transfer costs from the wholesale or retail price of the city indicated in the first column.

White potato prices will probably remain between S/.1.04 and S/.1.89.
Since the derived prices for other markets are generally higher than/have those that
prevailed in Cuzco, it appears that Cuzco could profitably export more
potatoes in the future to the Arequipa and Puno markets. However, the
price elasticity of demand for potatoes is probably kxt highly inelastic,
and increases in production may drive prices sharply downward unless adequate
marketing facilities are available. Tuber consumption estimates
indicate that rural families in the Sierra consume an average of 151 kilograms/
capita/year while the Sierra urban families consume only 136 kilograms/capita/
year (Appendix Table 6). This suggests that a small percent/increased of
production will be retained for on-farm consumption.

Quinua: The Cuzco and Puno departments combined produce over 75% of Peru's
total quinua production. It is primarily grown as a subsistence crop by
small farmers. The small quantities that are marketed in the Southern Sierra
are sent to the Lima and Arequipa markets. Some of it is processed into
flakes, flour, meal, etc. in Puno before it is marketed. The estimate in
Table 3.3 that 100% of quinua is retained for on-farm consumption is obviously
not correct, but it does indicate that only a relative minor volume leaves the
farm.

The May-June Lima wholesale quinua prices have fluctuated between S/.3.90
and S/.8.67 per kilogram during the 1958-64 period and has been declining
since the 1961 high (Table 3.7). Retail prices are not reported for quinua
for other cities.

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[1] The comments on quinua marketing and production in this section are
based upon White (1965). Quinua is a cereal crop native to the Peruvian
and Bolivian highlands.

The departmental average on-farm prices in Table 3.6 should be viewed with skepticism since in most cases they represent averages of only one to five price quotations. The prices given in Table 3.9 are somewhat lower and indicate the wide variation in on-farm prices. The practical range in average on-farm harvest-time price was S/.2.89 to S/.4.03 during 1963 and S/.2.53 to S/.3.00 during 1964 (Table 3.6). The 1964 Cuzco and Apurimac prices were above the upper limit of these practical ranges. The average on-farm harvest-time price of quinua was approximately S/.1.00 per kilogram higher in the Cuzco department than in the Puno department. In contrast to Lima wholesale price, the 1964 on-farm harvest-time price was higher than it was in 1963. Since quinua and wheat appear to be fairly close substitutes, one would not expect their price differentials in the future to be as great as they currently are. The Lima quinua prices relative to wheat are un-expectedly high;/ however, they will probably continue to be higher than the wheat prices.

If the Cuzco department becomes a surplus producer of quinua, it would have to compete in the Lima and Arequipa markets with the Puno department which has a locational advantage due to its lower transfer costs to these two markets. The transfer costs between the cities of Puno and Cuzco is S/.0.25 per kilogram. Therefore, the on-farm price of quinua in Cuzco would tend to be within S/.0.25 per kilogram of that in Puno. This, of course, is true only if the other market-ing charges . . . . . are similar. This does not appear unreasonable.

The 1964 Lima wholesale price less transfer costs implies a net farm price of S/.4.84 (5.87 - 0.98 - 0.05) in Cuzco. This price would be S/.0.25 lower under the conditions where Cuzco was competing with Puno for the Lima market. These derived prices are considerably higher than those currently prevailing. Generally, it is expected that quinua prices will decline. They will probably lie in the S/.2.40 to S/.4.50 range. The medium price of S/.3.00 seems most probable.

Table 3.9. On-farm harvest-time prices for quinua in selected production
areas for 1964[a]

City	Department	Price
		(soles/kg.)
Yauri	Cuzco	3.65
Huancani	Puno	1.10
Ayaviri	Puno	2.00
Yungayo	Puno	3.04
Cangallo	Ayacucho	2.50
Ayacucho	Ayacucho	2.00

[a]Source Cultivos, Cosechas, y Mercados (1964).

Barley: A brewery located in the city of Cuzco is one of the principal buyers of barley. Total domestic production has not been adequate and barley imports have ranged between 7 to 12% of Peru's production (Table 3.3). The brewery in Cuzco regularly imports barley and has made seed and credit available to farmers in hopes of stimulating production. Barley not used by the brewers is used for food and feed.

May-July Lima wholesale prices have been lower than the average annual import prices except for 1963 (Table 3.10). This is probably due to the fact that imports are of brewer's barley and consequently of higher quality. No consistent trend in these prices is evident. Retail prices are not available for other markets. However, the departmental average of on-farm harvest-time prices of barley increased from 1962 to 1964 (Table 3.6). The farm prices in the Cuzco department have been lower than those in the Puno and Arequipa departments. which is undoubtedly the reason that Cuzco farmers have occasionally found it profitable to break their contracts with the Cuzco brewery and sell to Puno. The practical range of on-farm barley prices during the 1962-64 period was S/.1.10 to S/.1.75. The 1964 farm prices reported for individual production areas were S/.1.70 for Sicuani and S/.1.80 for Cuzco which is somewhat higher than the other areas (Table 3.11). It would be expected that the price in Sicuani would be lower than that in Cuzco because the principal demand for barley produced in Sicuani is in the city of Cuzco.

The 1963 and 1964 derived farm prices for alternative market situations range between S/.2.76 to S/.1.45 (Table 3.12). The 1963 derived prices are higher than those that have prevailed while those for 1964 fall within the practical ranges given in Table 3.6. Barley prices will probably lie in the S/.1.45 to S/.2.25 range. They may tend to increase if supplies are not adequate to meet the brewer's demand. But, the brewer's price is probably above the average price that will be received due to the quality differential. A medium price of S/.1.80 is used for this analysis.

Table 3.10. May-July Lima wholesale prices and annual import prices of
barley 1958 to 1964a

Year	Lima wholesale[b] (May-July)	Average annual[c] import price
1958	2.40	3.12
1959	2.08	2.78
1960	1.80	2.88
1961	2.26	2.52
1962	2.21	2.69
1963	2.97	2.30
1964	2.50	---

[a]All prices converted to 1964 soles by deflating by Wholesale Price
Index given in Appendix Table 8.
[b]Adapted from Ministerio de Agricultura (1963) and (1964).
[c]Adapted from Estadistica del Commercio Exterior (1958 to 1963).

Table 3.11. On-farm harvest-time prices for barley in selected production
areas for 1964a

Production Area		Price
City	Department	
		(soles/kg)
Sicuani	Cuzco	1.70
Huancani	Puno	1.02
Ayaviri	Puno	1.00
Azarragro	Puno	1.60
Cuzco	Cuzco	1.80
Cangallo	Ayacucho	1.50
Ayacucho	Ayacucho	2.00

[a]Adapted from Cultivos, Cosecha y Mercados (1964).

Table 3.12.   Derived farm barley prices for Cuzco region for alternative
             market situations for 1963 and 1964

Basis for price	Derived farm price[a]
	(soles/kg)
1963 import from Matarani	2.76 (2.30 + 0.53 - 0.07)
1963 export to Lima wholesale market	1.92 (2.97 - 0.98 - 0.07)
1963 export to Arequipa and compete with Matarani imports	1.94 (2.30 + 0.13 - 0.42 - 0.07)
1964 export to Lima wholesale	1.45 (2.50 - 0.98 - 0.07)

[a]Calculated by adding or subtracting the transfer costs
   from the appropriate wholesale or import price in Table 3.10.

Corn: May-July wholesale prices(Table 3.7) of yellow corn in Lima have generally been S/.1.00 to S/.1.50 per kilogram lower than the average annual retail prices in southern Peru (Table 3.5) or April-July retail prices in southern Peru (Table 3.13). With the exception of 1958, Lima May-July wholesale prices have been close to S/.2.30 per kilogram. Retail prices for 1963 in both Sicuani and Cuzco were higher than the 1958-62 average.

On-farm harvest-time prices of yellow corn had a practical range of S/.1.36 to S/.2.94 from 1962 to 1964 (Table 3.6). 1964 farm prixces in Table 3.6 for the Cuzco Department are probably biased upward due to the inclusion of white corn prices.

The transfer costs from Lima to Cuzco and Sicuani are less than the corresponding price differentials. Therefore, it is expected that the retail prices in the southern Sierra area would tend to reduce somewhat due to the lower prices prevailing in the coastal region. The 1964 derived farm price based upon imports from Lima is 3.31 (2.39 - 0.98 - 0.06) for Cuzco. The corresponding 1964 farm price for exporting to the Lima market is S/.1.35 (2.39 - 0.98 - 0.06). It does not appear that future on-farm harvest-time prices would lie outside this range.

The Cuzco and Sicuani regions would most likely export to Arequipa their surpluses. They would have to compete in this market with central and southern coastal farmers whose on-farm harvest-time price is around S/.2.00 to S/.2.20. Moquequa producers, for example, received S/.2.08 in 1964 (Table 3.13). Thus the Cuzco and Sicuani on-farm harvest-time prices would probably not drop below S/.2.00. Yellow corn prices will probably lie in the S/.2.00 to S/.3.00 range. The medium price of S/.2.50 appears most likely.

Table 3.13. On-farm harvest-time prices in selected production areas and
April-July retail prices in selected markets for yellow corn
for 1964[a]

City	Department	Price
		(soles/kg)
Production area		Farm prices
Curahuaci	Apurimac	2.80
Cangallo	Ayacucho	2.00
Moquegua	Moquegua	2.08
Huanuco	Huanuco	2.00
Market city		Retail prices
Abancay	Apurimac	3.69
Cuzco	Cuzco	4.49
Sicuani	Cuzco	3.91
Puno	Puno	3.91
Ayaviri	Puno	3.91
Juliaca	Puno	3.91

[a]Adapted from Cultivos, Cosechas, y Mercados (1964).

Broad beans: Broad beans are grown primarily as a subsistence crop by the
indigenous farmers in the Sierra region. They are eaten in both the green
and dry form and also are toasted and used in about the same way as potato
chips.

May-July Lima wholesale dry broad bean prices have fluctuated between
S/.3.76 and S/.5.97 since 1958 (Table 3.7). Retail prices in the southern
Sierra, with the exception of Arequipa, have been markedly lower than the
Lima prices (Table 3.5). Retail prices in Sicuani and Cuzco have been
between S/.2.66 and S/.3.25. The reported on-farm prices are not very
reliable and/ARE probably biased downward since both green and dry prices are
usually averaged together. The upper limit of on-farm prices for Cuzco
is the derived price based upon the 1963 Lima price which
also is about the same as the 1963 Arequipa price. This derived on-farm
price used for the upper limit is S/.4.36 (5.39 - 0.98 - 0.05). The
lower limit was set at S/.2.50 and the medium one at S/.3.15. These prices
are somewhat higher than the practical on-farm price ranges given in Table 3.6
and near the upper limits of the retail prices for the southern Sierra cities
given in Table 3.5. Generally, it is expected that broad bean prices will
tend to increase in the southern Sierra due to the higher price in the
Lima market.

Sheepwool: A low percentage of livestock products is retained for consumption
by the farm family. Less than half the wool is retained for such purposes
(Table 3.2). From 1959 to 1963, 15% to 41% of sheep wool production was
exported (Table 3.3) and probably as high as 75% of the wool leaving the farm
is exported. Consequently, domestic wool prices are closely related to

export prices. Peru doesn't produce sufficient wool to influence the international market prices. The important factor to consider in Cuzco wool prices is the price differential between grades.

Wool from the Cuzco department normally goes to Arequipa and is exported from Port Matarani. Over 37% of the exports leave via Port Matarani (Table 3.14). About 86% of Peru's wool exports is greasy wool (Table 3.14). The principal grades of greasy wool exported from Matarani are Ordinaria Primera, Ordinaria Merina, and Mejorada Primera. The Lima average wholesale price has increased during the 1961-64 period. F.O.B. export prices were highest in 1963 and lowest in 1962 (Table 3.15). The derived farm prices for the Cuzco region in Table 3.16 are based upon the average 1961-64 Lima wholesale price and the 1962-64 F.O.B. export price. These prices correspond to classified and bundled wool exclusive of taxes.

The farm prices of wool given in Table 3.17 are similar to the derived prices. The derived prices are somewhat higher due to the fact they are based upon the higher quality grades and a more efficient marketing system. For the better grades of wool, a price range of S/.1,000 to S/.1,300 per cwt. with an average price of S/.1,119 is used in this analysis. A price range of S/.400 to S/.600 per cwt. and S/.875 to S/.1,050 per cwt is used for the low and average wool quality prices, respectively.

Alpaca wool: Alpaca wool prices are based almost exclusively upon export prices since virtually all of the domestic production is exported (Table 3.3). Most of the alpaca wool exporters are located in Arequipa and all but a very small proportion of the alpaca wool is exported via Port Matarani.

Table 3.14. Distribution of the quantity of sheep wool exports by grades and ports for 1963[a]

| Grade | Exports | | Export Port | |
| | | | Matarani | Others |
(greasy wool)	(metric tons)	(%)	(metric tons)	
Mejorada Merina	623	17	92	531
Mejorada Primera	186	5	186	0
Mejorada Segunda	6	—	6	0
Ordinaria Merina	617	17	601	16
Ordinaria Primera	2,182	61	657	1,525
Subtotal	3,614	100	1,542	2,072
(greaseless wool)				
Mejorada Merina	21	4	20	1
Mejorada Primera	145	25	145	0
Mejorada Segunda	0	0	0	0
Ordinaria Merina	120	21	51	69
Ordinaria Primera	233	39	27	206
Others	62	11	62	0
Subtotal	581	100	305	276
Total	4,195	—	1,847	2,348

[a]Adapted from Estadistica del Comercio Exterior (1963, pp. 326-8).

Table 3.15. Prices of sheep wool on greasy basis by grades, type of price, and location for 1961-1964[a]

| Type of price | Location | Year | Grades | | | |
			Mejorada[b] Primera	Ordinaria[b] Merina	Ordinaria[b] Primera	Average
Domestic wholesale classified and bundled	Lima	1961				1,168
		1962				1,207
		1963				1,334
		1964				1,379
Average						1,272
F.O.B. for exports	Peruvian ports	1962	1,314	1,083	910	—
		1963	1,478	1,210	1,012	—
		1964	1,466	1,164	985	—
Average			1,419	1,152	969	—

[a]Unpublished data furnished by Departamento de la Industria Lanar, Banco de Fomento Agropecuario del Peru, Lima, Peru. Value of export taxes excluded.
[b]Midpoint of annual price range.
[c]Deflated by Index of Wholesale Prices (1964 = 100) given in Appendix Table 8.

Table 3.16. Derived on-farm prices of wool for Cusco region for alternative markets and qualities

Basis of price and quality	Derived farm price[a]
	(soles per 100 lbs)
Average: Lima wholesale	1220 (1272 - 49 - 3)
Mejorada Primera: F.O.B. Matarani export	1386 (1419 - 30 - 3)
Ordinaria Merino: F.O.B. Matarani export	1119 (1152 - 30 - 3)
Ordinaria Primera: F.O.B. Matarani export	936 (969 - 30 - 3)

[a]Calculated by subtracting transfer costs from from the average prices given in Table 3.15.

Table 3.17. Farm prices of wool according to levels of improvement of sheep[a]

Level of improvement of sheep	Price
	(soles/100 lbs.)
Purebred or highly improved	1200
Improved	1125
Medium improved	1050
Slightly improved	900
Not improved	500

[a]Adapted from Peschiera et al. (1963, p. 32).

Prices in this study correspond to the grades Primera Arequipa and Gruesa (coarse) which accounted for 76% and 8%, respectively, of 1963 Exports (Table 3.18). However, these two grades include a wide variety of qualities. The basic factor influencing price is color, with the white and light colors having the higher prices.

The Cuzco derived farm prices for the Primera Arequipa and Gruesa grades based upon the 1962-64 export price averages in Table 3.19 are S/.2157 (2190 - 30 - 3) for Primera Arequipa and S/.873 (906 - 30 - 3) for Gruesa. These prices correspond to the medium price level used. The price ranges of S/.2,050 to S/.2,300 and S/.800 to S/.950 were used for Primera Arequipa and Gruesa, respectively.

Cattle Prices: According to the Plan del Sur (PS/C/29, p. 17) about 70% of the cattle in southern Peru are raised by the small farmers who rely upon them as a "cash" crop and retain only a small proportion for their consumption. This is reflected in the data in Appendix Table 6. Meat consumption in rural Sierra areas is about one-fourth that of the non-rural population and less than one-half/the recommended level. This suggests that/the income and price elasticities of meat are rather high.

Lima and Arequipa are the major markets for Cuzco cattle. Cattle prices in Lima have been regulated by sporadic controls and import policy designed to hold down prices. These controls have probably been successful in holding prices somewhat below their equilibrium levels and are in part responsible for the fact that domestic beef production has not increased sufficiently to meet the demand. As a result, beef imports have jumped from 4 to 12% of domestic production from 1959 to 1961 to   45% in 1963 (Table 3.3).

Table 3.18. Distribution of the quantity of alpaca wool exports by grades for 1963[a]

Grade	Exported[b]	
(greasy wool)	(metric tons)	(%)
Primera Arequipa	2,912	76
Pelada or muerta	157	4
Gruesa	298	8
Segunda	173	5
Other	270	7
Total	3,810	100

[a]Adapted from Estadistica del Commercio Exterior (1963, pp. 327-328).
[b]All but 50 metric tons were exported from Port Matarani.

Table 3.19. Prices of alpaca wool on greasy basis by grades, F.O.B., Peruvian Port Matarani, for 1962-64[a]

Year	Primera Arequipa (fleece)	Gruesa (coarse)
	(1964 soles per 100 lbs)	
1962	2,093	863
1963	2,181	954
1964	2,295	901
Average	2,190	906

[a]Unpublished data compiled by Departamento de la Industria Lanar, Banco de Formento Agropecuario del Peru, Lima, Peru. Prices exclusive of export taxes. Prices deflated by Wholesale Price Index (1964 = 100) in Appendix Table 8.

Average Lima live cattle prices increased slightly from 1963 to 1964
(Table 3.20). However, they have been lower than the/import prices (Table 3.21).
Lima retail beef prices have tended to be between 20 to over 100% higher
than those for southern Peru cities (Table 3.22). This difference, however,
appears to be narrowing. Traditionally, Lima consumers have been unwilling
to pay significant price differentials according to quality and, consequently,
quality price differentials have been rather small and in many cases non-
existent. Due to the low price differentials and relatively high grain
prices, cattle from the sierra are usually short-fed for only about 90 days
on cotton seed meal and forage before they are slaughtered.

Farm prices are not reported for livestock. Generally, buyers tour
the country side and buy two or three head in small fairs or at the farm and
then ship them to the coast.

Derived farm prices for the Cuzco region are S/.8.34 for fattened
cattle and S/.7.29 for the others based upon Lima slaughter house prices and
S/.11.73 based upon Lima imports (Table 3.23). Since retail prices in the
southern Sierra relative to Lima are rather low, it is anticipated that
cattle prices in Cuzco will tend to increase. Fattened cattle prices for
Cuzco will probably lie in the range of S/.7.00 to S/.11.73 and other cattle
S/.6.50 to S/.10.68. Average prices for these two grades of S/.8.34 to
S/.7.29 were used in this analysis.

Table 3.20.   Bi-monthly and average prices for cattle and sheep for Lima
slaughter houses 1963 and 1964[a]

Year and Month	Fattened cattle	Other cattle	Lambs	Fattened sheep	Other sheep
	(1964 soles per kilogram liveweight)[b]				
1963					
January	9.51	8.54	8.79	9.22	8.59
March	9.92	8.50	8.78	9.31	8.61
May	9.39	8.43	8.98	9.34	8.40
July	9.17	7.92	9.07	9.38	7.98
September	9.84	8.65	8.99	9.39	8.27
November	9.89	8.58	9.06	9.42	8.14
Average	9.62	8.44	8.95	9.35	8.33
1964					
February	9.87	8.83	8.70	9.02	8.16
March	9.88	8.85	8.67	8.98	8.08
May	9.88	8.85	8.68	9.00	8.00
July	9.86	8.80	8.65	8.87	7.96
September	9.90	9.26	8.71	9.00	8.15
November	10.09	9.39	8.52	9.06	8.48
Average	9.92	9.00	8.66	8.99	8.14
1963-64 average	9.77	8.72	8.81	9.17	8.23

[a]Adapted from Cultivos, Cosechas, y Mercados (1963 and 1964).
[b]Prices deflated by Wholesale Price Index (1964 = 100) given in
Appendix   Table 8.

Table 3.21. Average annual import prices of live cattle to Lima,
1958 to 1963[a]

Year	Price
	(1964 soles/kg.)
1958	14.06
1959	13.38
1960	12.81
1961	12.20
1962	11.65
1963	14.84
Average	13.16

[a]Adapted from Estadistica del Commercio Exterior (1958 to 1963). Price
calculated by dividing annual import values of live cattle imports by number
of head imported times 260 kg. average import weight per head. Prices deflated
by Wholesale Price Index (1964 = 100) given in Appendix Table 8.

Table 3.22. Estimated liveweight prices of cattle and sheep based upon
retail meat prices for selected cities for 1958-62 and 1963[a]

Location of retail market		Cattle (1st quality)		Sheep (1st quality)	
City	Department	1958-62	1963	1958-62	1963
		(soles per kilogram)			
Lima	Lima	11.83	11.06	10.46	10.52
Arequipa	Arequipa	7.98	8.56	7.43	—
Cuzco	Cuzco	7.00	7.78	7.02	7.78
Sicuani	Cuzco	5.34	6.29	5.45	6.29
Ayaravi	Puno	4.40	5.87	4.40	5.87
Juliaca	Puno	5.49	—	5.47	—
Urcos	Cuzco	7.50	7.55	—	—

[a]Converted to liveweight prices by multiplying retail prices by 0.55.
Retail prices taken from "Precios Promedios de Productos Agropecuarios...."
Ministerio de Agricultura (1964). Prices deflated by Wholesale Price Index
(1964 = 100) given in Appendix Table 8.

Table 3.23. Derived farm prices for cattle and sheep for Cuzco region
for alternative market situations

Basis for price and type of livestock	Price
	(1964 soles per kg. liveweight)
1963-64 Lima slaughter houses	
Fattened cattle	8.34 (9.77 - 1.36 - 0.07)
Other cattle	7.29 (8.72 - 1.36 - 0.07)
Lambs	7.38 (8.81 - 1.36 - 0.07)
Fattened sheep	7.74 (9.17 - 1.36 - 0.07)
Other sheep	6.80 (8.23 - 1.36 - 0.07)
1958-63 average Lima imports	
Cattle	11.73 (13.16 - 1.36 - 0.07)

Mutton: Sheep have traditionally been raised for their wool and slaughtered only at the end of that productive life. The majority of mutton is probably consumed by the rural Sierra population. Dry lot or pasture fattening of sheep is practically nonexistent.

Lima consumers have generally shown a strong preference for beef over mutton. Therefore, the price elasticity of demand for mutton in Lima is probably highly inelastic and the bulk of the mutton will continue to be consumed in the Sierra and southern Peru area. Lima mutton prices actually were lower in 1964 than they were in 1963 (Table 3.20).

The relative retail price differentials between beef and mutton in Table 3.22 are probably smaller than actually exist because the prices reported for these cities frequently are the same for all kinds of meat. This is due to the meat price controls in these cities. However, the difference between beef and mutton prices in southern Peru is probably less than that in Lima.

The derived mutton prices (Table 3.23) based upon the Lima market most likely correspond to the maximum expected price. The lower prices in southern Peru (Table 3.22) probably are more representative of future price levels. The liveweight prices used in this analysis for the Cuzco region were as follows: lambs S/.6.00 to S/.7.38, fattened sheep S/.6.25 to S/.7.74, and other sheep S/.5.50 to S/.6.80. Future prices will probably lie closer to the lower limit than the upper one.

Alpaca Meat: Alpacas are raised exclusively for their wool and their meat probably has very inelastic price and income elasticities of demand, particularly among the urban and non-Sierra population. When the alpaca's productive

wool-producing life has ended, they are slaughtered on the farm and the meat is dried and retained primarily for on-farm consumption. A relatively minor proportion of alpacas are slaughtered in commercial packing houses. Prices of S/.125 to S/.160 per head, depending upon age and size, were used in this analysis.

Table 3.24 Estimated current, expected future, minimum and maximum on-farm harvest-time prices for selected commodities for the Cuzco Sierra Region[a]

Commodity	Current (1963-64) Price	Predicted Future Prices		
		Expected	Minimum	Maximum
		(soles per kilogram)		
Barley	1.70	1.80	1.45	2.25
Broad beans	2.50	3.15	2.50	4.00
Corn	2.40	2.20	2.00	2.50
Potatoes	1.00	1.40	1.00	1.75
Quinua	3.00	3.00	2.40	3.50
Wheat	2.30	2.70	2.00	3.00
Fattened cattle	7.00	8.35	7.00	11.75
All other cattle	6.50	7.30	6.50	10.70
Lambs	6.00	6.00	6.00	7.40
Fattened sheep	6.25	6.25	6.25	7.75
All other sheep	5.50	5.50	5.00	6.80
		(soles per 100 pounds)		
Sheep wool:				
Traditional	500	500	400	600
Transitional	935	935	875	1,050
Modern-Potential	1,120	1,120	1,000	1,300
Alpaca wool:				
Primera Arequipa	2,160	2,160	2,050	2,300
Gruesa	875	875	800	950

[a]Based upon the market prices presented in Appendix Tables 1, 2, and 3. Prices are in 1964 constant soles.

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[1]/ See page 38, footnote 1.

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[2] English copies of these papers are or will be available upon request to the Department of Economics, North Carolina State University, Raleigh, N. C.

Appendix Table 1. Estimated transfer costs and loading and unloading charge by truck and train for selected commodities under Coastal and Sierra conditions

| Commodity | Truck[a] | | Train[b] | Loading and unloading charge for truck or train |
	Sierra conditions	Coastal conditions		
	(soles per metric ton per kilometer)			(soles per metric ton)
Sheep and cattle	1.26	0.92	0.65	20.00
Wool	0.96	0.55	0.81	20.00
Crops	0.96	0.55	0.65	20.00

[a]Truck costs adapted from G. Mathia (1965). Based upon four ton truck operating 60,000 kilometers per year with an average life of six years at a speed of twenty and forty kilometers per hour for Sierra and Coastal conditions, respectively. Assumed load weight of three metric tons for sheep and cattle and five metric tons for wool and crops.

[b]Train costs based on unpublished data provided by the Southern Railway Company. Basic rail cost for Cusco to Arequipa and Cusco to Huadquina are S/.500 and S/.145 per metric ton respectively, for wool and S/.400 and S/.80 per metric ton, respectively, for sheep, cattle, and crops.

Appendix Table 2. Estimated transportation costs between selected cities by rail and truck for sheep and alpaca wool[a]

| City | City | | | |
	Cuzco	Lima	Arequipa	Sicuani
	(soles per 100 lbs.)			
Cuzco	0			
Lima	49[c]	0		
Arequipa	24[b]	26	0	
Sicuani	6[b]	44[c]	18[b]	0
Matarani	30[b]	27	7[b]	25[b]

[a]Based upon per unit cost rates given in Appendix Table 1. Includes loading and unloading cost of S/.20 per metric ton. All costs are for trucks unless indicated otherwise.
[b]Based upon rail cost.
[c]Based upon both rail and truck costs.

Appendix Table 3. Estimated transportation costs between selected cities by rail and truck for cattle and sheep[a]

| City | City | | | |
	Cuzco	Lima	Arequipa	Puno
	(soles per metric ton)			
Cuzco	0			
Lima	1,359[c]	0		
Arequipa	420[b]	959[d]	0	
Puno	250[b]	1,188[c]	249[b]	0
Sicuani	112[b]	1,267[c]	328[b]	158[b]
Quillabamba	178[c]	1,517[c]	578[c]	408[c]

[a]Based on per unit cost rates given in Appendix Table 1. Includes loading and unloading cost of S/.20 per metric ton. All costs are for trucks unless indicated otherwise.
[b]Based upon rail costs.
[c]Based upon both rail and truck costs.

Appendix Table 4. Estimated transportation costs between selected cities by rail and truck for crops[a]

| City | City | | | | | |
	Cuzco	Lima	Arequipa	Puno	Sicuani	Quillabamba[c]
	(soles per metric ton)					
Cuzco	0					
Lima	981[c]	0				
Arequipa	420[b]	581	0			
Puno	250[b]	810[c]	249[b]	0		
Sicuani	112[b]	889[c]	328[b]	158[b]	0	
Quillabamba	160[c]	1,121[c]	560[c]	390[c]	252[c]	0
Matarani	532[b]	--	132[b]	361[b]	440[b]	672[c]

[a]Based on per unit cost rates given in Appendix Table 1. Includes the loading and unloading cost of S/.20 per metric ton. All costs are for trucks unless indicated otherwise.
[b]Based upon rail costs.
[c]Based upon both rail and truck costs.

Appendix Table 4. Estimated transportation costs between selected cities by rail and truck for crops[a]

City	City					
	Cuzco	Lima	Arequipa	Puno	Sicuani	Quillabamba[d]
	(soles per metric ton)					
Cuzco	0					
Lima	981[c]	0				
Arequipa	420[b]	581	0			
Puno	250[b]	810[c]	249[b]	0		
Sicuani	112[b]	889[c]	328[b]	158[b]	0	
Quillabamba	160[c]	1,121[c]	560[c]	390[c]	252[c]	0
Matarani	532[b]	---	132[b]	361[b]	440[b]	672[c]

[a]Based on per unit cost rates given in Appendix Table 1. Includes the loading and unloading cost of S/.20 per metric ton. All costs are for trucks unless indicated otherwise.

[b]Based upon rail costs.

[c]Based upon both rail and truck costs.

Appendix Table 5. Estimated intra-regional transfer costs for selected
commodities for Cuzco Sierra region[a]

Item	Transfer cost
	(soles per metric ton)
Potatoes	80
Wheat	71
Corn	56
Barley	71
Quinua[b]	48
Broad beans[b]	50
Alpaca wool[b]	66 (3)[d]
Sheep wool[b]	65 (3)[d]
Cattle[c]	67
Sheep[c]	71
Alpacas[c]	72

[a]Calculated by weighing the transfer costs from each province capital
to its respective market center by the relative percent of the total volume
sold in the market region as given in the Plan del Sur (PS/G/59, pp. 185-259).
[b]Based on production instead of volume sold.
[c]Based on volume sold and consumed.
[d]Soles per 100 pounds (quintal of 46 kgs.).

Appendix Table 6. Estimates of annual per capita consumption of selected
food products for rural Sierra areas, Cuzco city
laborers and employers and minimum recommended diet

Item	Sierra rural areas[a]	Cuzco city laborers and employers[b]	Minimum recommended diet for Sierra region[c]
		(kilograms per year)	
Meat	14.9	57.9	35.0
Fish	0.3	4.9	---
Milk and eggs	13.4	81.9	174.6
Fats and oils	2.9	7.6	15.4
Fruits	3.0	26.0	45.6
Tubers	150.9	136.3	140.5
Fresh vegetables	32.4	75.8	73.4
Dried vegetables	7.7	41.5	14.3
Cereals	119.6	97.5	87.8
Sugar	---	31.6	21.6
Miscellaneous	17.0	---	---
Total (all food)	362.1	561.0	608.2

[a]Adapted from Collazos, et al. (1960). Data based upon family surveys
between period 1951-1955 for the following Sierra locations: Vicos,
Recuayhuanca, Chacan, Puno, and Paucarcalla.
[b]Adapted from Plan del Sur (PS/D/34. pp. 110-112). Corresponds to
family budget data collected in 1959.
[c]Adapted from unpublished data provided by Instituto de Nutricion,
Ministerio de Salud Publica, Lima, Peru. Based upon the minimal diet
requirements by age group weighted by the percentage each age group is
of the total Cuzco population.

Appendix Table 7. Conversion rates for Peruvian soles per kilogram to
U.S. dollars per bushel and pound[a]

Soles/kg.	Wheat, potatoes, beans, etc. 60 lbs/bushel	Barley 47 pounds/ bushel	Shelled corn 56 pounds/ bushel	Cents per pound
	(dollars per bushel)			
1.50	1.52	1.19	1.42	2.535
1.75	1.77	1.39	1.66	2.958
2.00	2.03	1.59	1.89	3.380
2.25	2.28	1.79	2.13	3.803
2.50	2.54	1.99	2.37	4.225
2.75	2.79	2.18	2.60	4.648
3.00	3.04	2.38	2.84	5.070
3.50	3.55	2.78	3.31	5.915
4.00	4.06	3.18	3.79	6.760
5.00	---	---	---	8.450
10.00	---	---	---	16.900
15.00	---	---	---	25.350
20.00	---	---	---	33.800

[a]Converted at exchange rate of one U.S. dollar equal to 26.82 Peruvian soles. One kilogram equals 2.205 pounds. One sole per kilogram equals $0.0169/pound.

Appendix Table 8. Wholesale Price Index for Peru 1957-1964 (1964 = 100)[a]

Year	Index	Reciprocal
1957	59.7	167.5
1958	64.1	156.0
1959	77.3	129.4
1960	87.2	114.7
1961	90.4	110.6
1962	92.7	107.9
1963	95.1	105.2
1964[b]	100.0	100.0

[a]Adapted from Banco Central de Reserva del Peru, (1964, p. 41).
[b]Index as of March, 1964.

Appendix Table 9. Wholesale, retail, import and on-farm harvest-time crop prices and percentage changes[a]

Basis of Price	Barley	Dried[b] Broad Beans	Yellow[c] Corn	Potatoes	Quinua	Wheat
	(1964 constant soles per kilogram and percent)					
Lima Wholesale Price during harvest season (1958-62)[d]	2.15	4.66	2.53	1.99	6.08	2.95
Lima Wholesale Price during harvest season (1963-64)[d]	2.74	5.60	2.34	1.90	6.08	3.07
Percent change	+27	+20	-9	-5	0	+4
Retail price in five southern Peru cities (1958-62)[e]	---	3.62	3.20	2.03	---	3.00
Retail price in five southern Peru cities (1963)[e]	---	3.67	3.58	2.00	---	3.09
Percent change	---	+1	+12	-1	---	+3
Import price (1958-62)[f]	2.80	---	---	---	---	2.47
Import price (1963)[f]	2.30	---	---	---	---	2.21
Percent change	-18	---	---	---	---	-11
On-farm harvest-time in Cuzco, Apurimac[g] Arequipa, and Puno departments (1962)	1.38	2.75	2.51	1.66	2.48	2.28
On-farm harvest-time in Cuzco, Apurimac[g] Arequipa, and Puno departments (1963-64)	1.72	2.17	2.42	1.48	3.03	1.98
Percent change	+25	-21	-4	-11	+22	-13

[a]All prices were deflated by Wholesale Price Index given in Appendix Table 8.

[b]On-farm and retail prices of broad beans probably are an average of both the dried and green types.

[c]On-farm and retail prices of yellow corn are probably biased upward due to the inclusion of white corn prices in the reported statistics.

[d]Adapted from Ministerio de Agricultura (1963), (1964), and Cultivos, Cosechas y Mercados, July, 1964.

[e]Adapted from Ministerio de Agricultura (1964), Precios promedio de productos agropecuarios años 1953 a 1957, 1958-1962 comparados con 1963. Segun informacion de Concejos Provinciales colobaradores.

[f]Adapted from Estadistica del Commercio Exterior (1958 to 1963).

[g]Adapted from Ministerio de Agricultura (1964) Estadisticas de los precios de productos agricolas "En Chaxra".

Appendix Table 10. Lima slaughter house, southern Peru Sierra retail, and Lima import cattle and sheep prices and percentage changes by grades*

Basis of Price	Fattened cattle	All other cattle	Lambs	Fattened sheep	All other sheep
	(1964 soles per kilogram liveweight and percent)				
Prices paid by Lima slaughter house (1963)[b]	9.62	8.44	8.95	9.35	8.33
Prices paid by Lima slaughter house (1964)[b]	9.92	9.00	8.66	8.99	8.14
Percent change	+3	+7	-3	-4	-2
Retail price in five southern Peru Sierra cities (1958-62)[c]	---	6.29	---	---	5.95
Retail price in five southern Peru Sierra cities (1963)[c]	---	7.21	---	---	6.65
Percent change	---	+15	---	---	+12
Lima import price (1958-62)[d]	12.82	---	---	---	---
Lima import price (1963)[d]	14.84	---	---	---	---
Percent change	+16	---	---	---	---

[a]All prices were deflated by Wholesale Price Index given in Appendix Table 8.

[b]Adapted from Ministerio de Agricultura (1963 and 1964), Cultivos, Cosechas y Mercados, Lima, Peru.

[c]Adapted from retail prices given by Ministerio de Agricultura (1964), Precios promedios de productos agropecuarios años 1953 a 1957, 1958-1962 comparados con 1963, Según información de Concejos Provinciales colaboradores, Lima, Peru, by multiplying the retail price by 0.55. The six cities are Cusco, Sicuani, Ayaviri, Juliaca, Urcos, and Arequipa.

[d]Adapted from Estadistica del Commercio Exterior (1958 to 1963). Price calculated by dividing annual import values of live cattle imports by number of head imported times 280 kg. average import weight per head.

Appendix Table 11. F.O.B. export, domestic wholesale, farm prices, and percentage changes for sheep and alpaca wool by grades[a]

Basis of Price	Alpaca		Sheep			
	Arequipa First (fleece)	Coarse	Improved First Quality	Ordinary Merino	Ordinary First Quality	Low Quality
	(1964 soles per 100 pounds)					
F.O.B. Peru exports 1962[b]	2,093	863	1,314	1,083	910	---
F.O.B. Peru exports 1963-64[b]	2,238	927	1,472	1,187	998	---
Percent change	+7	+7	+12	+10	+10	---
Lima domestic wholesale 1961-62[b]	---	---	---	---	1,188	---
Lima domestic wholesale 1963-64[b]	---	---	---	---	1,356	---
Percent change	---	---	---	---	+14	---
Sierra farm prices[c]	---	---	1,200	1,125	1,050	500

[a]All prices were deflated by Wholesale Price Index given in Appendix Table 8.
[b]Unpublished data compiled by Departamento de la Industria Lanar, Banco de Formento Agropecuario del Peru, Lima, Peru. Prices are net of export taxes.
[c]Adapted from Peschiera, et al. (1963, p. 32).