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Bench Marks from Which Economic Change can be Measured for an Altiplano Community

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BENCH MARKS FROM WHICH ECONOMIC CHANGE CAN BE MEASURED FOR AN ALTIPLANO COMMUNITY

by

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Cristina A. Kennington

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ABSTRACT

Bench Marks from which Economic Change can be

Measured for an Altiplano Community

by

Roberto Julio Gonzalez

Utah State University, 1970

Major Professor: Dr. N. Keith Roberts
Department: Economics

This thesis is designed to establish bench marks which will facilitate the measurement of impacts of new crop and livestock extension practices on the rate of community development of the village of Achica Bajo, Bolivia. Successful agricultural extension and community development programs require adequate data at the farm and community level. In the absence of a real appreciation for the levels of income and financial needs of the campesinos, it is difficult to institute farm policies such as land tax measures which will have the desired impacts and consequences as well as peasant acceptance.

The study examines human and agricultural resources available to the community. Then utilization of these resources as measured by consumption, production and resulting income levels are measured. All of the demographic cultural and resource data were developed through first-hand field surveys.

The natural rate of population increase was calculated at nearly seven percent, all of which must be absorbed by the present four hectares average sized farm unit available to the 129 cultivators of the village. Aggregate village income of about $36,000, during the bench mark year of 1967, was divided among these same producing units. Crop yields were found

to be much below their potentials given proper irrigation and land cultivation practices. Part of the reasons for low agriculture productivity may also be attributed to the scale of individual farm activity for it was discovered that at least 40 percent of aggregate community income was derived from off-farm activities during 1967.

Over 55 percent of the total value of private assets are accounted for by livestock holdings, but income from this sector accounted for only 29 percent of the aggregate. Again natural factors such as poor breeds, low nutritional content of natural pastures and inadequate management practices are the important contributors to low productivity.

The rate of investment in the community is insignificant. Present income levels do not generate internal investment capacity. Most transactions take place outside of the community, since commerce accounts for only about 13 percent of aggregate community income. Thus, most of the value added in agriculture through community activities is captured by persons or groups outside the community. Per capita earnings in the community are less than one half the national average but are probably representative of the rural sector of Bolivia in general.

Some 62 percent of the population, seven years of age or over, had received at least one year of schooling and about 58 percent of the population over age seven were classed as literate. Nevertheless, 47 percent of the children of school age years were not attending school.

Greater outside employment or improvements in agriculture productivity levels must be achieved in order to maintain or improve income levels in the community.

A listing of quantitative bench marks covering many aspects of social and economic activity for the community of Achica Bajo are presented at the end of the thesis.

(161 pages)

INTRODUCTION

This study was made possible by a research assistantship granted to the author by Utah State University in connection with its USAID sponsored program in Bolivia. The plan of work designed by the USU team includes an integrated agricultural development program to be applied in a selected community. This program is designed to test complementary extension practices such as livestock and forage improvements. In order to measure some of the social and economic consequences, it was necessary to establish community development benchmarks. Hence, the need for the present study.

The importance of economic studies of peasant communities can hardly be overemphasized. The bulk of the population of the world's less developed countries live in villages where hunger and misery exist alongside extravagant opulence for the few. These factors provide the specific conditions for violent struggle. To avoid this, rapid progress is necessary to close this gap.

In order to accelerate rural community changes, information is needed on the peasant society, its resources, its structure, and the social and cultural phenomena that affect it. Thus, the study of peasant communities is impelled by the course of contemporary history. Primitive agrarian communities have ceased to be static laboratories for exclusive use of anthropologists. If the political stability of the world is to be maintained much has to be accomplished by social scientists working at the rural community level.

In Bolivia the need for economic studies of rural communities could hardly be greater. The agricultural sector in the 17 years since the agrarian reform has probably experienced more alteration in class structure than during the entire life of the Republic. Farming benefits have ceased to be a monopoly of a minority. In turn, this has led to some changes in the peasants' traditional way of life. It should be recognized, however, that a land re-distribution program is only to make the land play a greater social role by spreading the economic benefits from land ownership.

Thus, in the absence of productivity increase, the subsistence character of agriculture will not rapidly improve. Thus, if agriculture is to bring immediate economic betterment to the peasantry and contribute to the growth of the country, there is a need for programs such as agricultural extension and community development.

But to be successful such programs require adequate data at the farm and community level. Current events confirm this necessity. Strong peasant resistance in 1968 to a single land tax Impuesto unico cannot be dismissed as wholly politically inspired. In the absence of studies that determine the campesinos level of income and financial needs, no one can reasonably claim that the agrarian reform has emancipated them to the point that a blanket land tax should be imposed.

Given such a context this study may prove fruitful. Although its scope is regional, it provides a panoramic view of typical community life on the Altiplano.

From the author's point of view the study proved a unique and memorable experience indeed. As an urban Bolivian he became aware of the hard reality under which most of his countrymen live. At the same time, the eyes of the world were on an armed guerrilla movement that was desperately trying to obtain peasant support. The Bolivian government, as one means to counteract support for the revolutionists, inundated the countryside with literature charging guerrillas with intent to wrest lands from the peasants in order to obtain state control.

All these events caused an air of suspicion among the campesinos. Under such circumstances the survey of Achica Bajo not only proved very challenging, but provided the author with an insight into the economic-social dilemma that affects Bolivia.

FRAMEWORK OF THE STUDY

Objectives

This study was designed to provide the bench marks from which economic changes can be measured in the community of Achica Bajo. Since social and economic factors are so closely interrelated in research at the community level, a purely economic study would have fallen short of describing effectively the community situation. For this reason, and accepting the distinction between "economic aims as the intermediate and social aims as the final goals of development" the overall objective of this study is to set the bench marks for the community by describing its social and economic situation.

The specific objectives of the community study were as follows:

1. To measure the human resources and describe their demographic, educational and occupational characteristics

2. To examine and quantify agricultural and livestock operations

3. To determine the consumption, production, and resource utilization patterns

4. To measure the income level and describe the flows of economic activity.

Since no data were available for the community whatsoever, satisfaction of the first three objectives was a necessary preliminary step toward the accomplishment of the fourth and main objective of the study. Additional material that appears in the text such as country background

and climatic data is to point out aspects that are essential to an understanding of community economic development in Bolivia.

Procedures

This extensive study materialized in four stages. These were planning, data collection, analysis and presentation of findings. The planning and collection of data stages were performed in Bolivia from January to September 1967. The other two stages were completed at Utah State University between July 1968 and February 1969.

To describe in detail all the tasks that this study required would be long and burdensome. Therefore, only a brief description is made of the work development in this procedural section.

Planning

Before a survey can be made there are many tasks that have to be accomplished. The first step consisted of determining the scope of the study and setting up the work calendar to be followed. The next step was selection of the community to be studied. This endeavor proved to be strenuous. Upon reaching remote communities one had to overcome the skepticism of local people toward a stranger that wanted to learn a lot about them. Moreover, it was necessary to find a community meeting the technical requirements set to implement an entire project of which this study was only a part. Both of these factors made the area selection difficult. The participation of representatives of the Bolivian Ministry of Agriculture was helpful in laying the foundation

for the cooperation of the community of Achica Bajo. The following tasks consisted of the preparation and testing of questionnaires, the organizing and training of a local team of ten volunteer field workers. Finally, in this stage there was the preparation of all community members for the actual field survey. Needless to say, this required a series of challenging tasks. This was necessary to prove to the now proud campesinos that not all white people that visit their communities are exploiters or demagogic politicians.

Data collection

This stage included a field survey, the collection of secondary data, close supervision of the field workers and cross-checking of data collected for inconsistencies. Data generated by the field survey constitute the core of this study. Secondary information was obtained from agencies of the Bolivian Ministry of Agriculture, libraries and knowledgeable informants. The field survey generated information through a house-to-house canvas. Five questionnaires of about four pages each were used. The first questionnaire was administered in all of the households that formed the community. This census provided a complete enumeration of the population. It became the basis for the selection of three household samples to administer three questionnaires to obtain assets, income and expenditures. In order to preserve the respondents patience, a household was included in not more than one sample in addition to the initial census. The sample selections were done at random. The agricultural survey, for reasons indicated later, was conducted only on ten farms that freely volunteered. The following

chart summarizes information on the collection of field data.

Data analysis

The value of a survey depends largely on careful and skillful analysis. Therefore, considerable time was allocated to this stage. The main tasks performed were classification, editing, coding, tabulation, and interpretation of data. Only in the preparation of statistical tables from the population census was electronic equipment used. For generalizations and projections made for the entire community, sample averages obtained from survey data were checked for consistency against facts secured from secondary data.

Presentation of findings

There are three major parts in this presentation. The first one deals with the human and social aspects of Achica Bajo. The second part deals with agriculture in the community. It is mainly a descriptive study avoiding economic considerations. Thus, crop outputs and inputs are discussed in physical terms only. The third part, dealing with the community economy, satisfies the fourth and main objective of the study. It describes the flow of economic activity and the community level of income. The study concludes with a summary section.

		Households surveyed	Type of information obtained
Achica Bajo Study 1967	Population census	126	demographic migrational educational occupational
	Agricultural survey	10	land tenure land use crop production agricultural practices
	Assets survey	22	household goods farm equipment livestock livestock practices farm improvements
	Income survey	20	crop output produce distribution marketing employment commerce business attitude
	Expenditures	20	monthly food purchases annual clothing purchases other expenditures social & cultural attitudes

BACKGROUND OF THE COUNTRY

Physical Environment

Bolivia, a landlocked nation, is located in the heart of South America. Its 424,000 square miles approximates that of France and Spain together. In area it is the fifth of the eleven South American republics.

The land of Bolivia, physically speaking, is divided into three main regions. These are the highlands, the valleys, and the tropical plains. Within each of these main zones, contrasts are clearly distinguished. The landscape alters with elevation; temperature, rainfall, and vegetation depend upon the sudden changes of altitude (13, p. 5). The spread in altitude in the entire country is from about 300 feet to over 21,000 feet above sea level (1, p. 43).

The highlands occupy about one-third of the total area of the country. It comprises the Altiplano, which is surrounded by the Eastern and Western Cordilleras of the Andes. The Altiplano, a relatively level surface between the mountain chains, is over 500 miles in length and from 80 to 100 miles in width (1, p. 46). Its average altitude above sea level is 10,000 feet. It is the largest region of interior drainage in South America with Lake Titicaca, the highest navigated lake in the world, in the northern part and shallow Lake Pcopo in the southern part. Its soils, which are mostly barren, are the result of sedimentary deposits from the mountain slopes. Due to its altitude the Altiplano has generally cool temperatures.

The valley area is formed by the gradual eastern slope of the Andes. The tropical llanos are the flat zone extending toward Brazil. Both areas are important agricultural zones, owing to their generally favorable growing conditions. Their agricultural production is more diversified than in the Altiplano.

Population and Social Structure

Bolivia is a sparsely populated country with an average density of only about 8.5 persons per square mile. The population in 1966 was estimated at 4.2 million (7, p. 7) which exceeds only Paraguay and Uruguay in South America. Despite its harsh conditions the highlands support close to two-thirds of the total population while comprising one-third of the country. Furthermore, the majority of these people are located in the northern Altiplano which has a density considerably higher than the more arid southern region.

Bolivia is predominantly an Indian nation. An ethnic distribution of the population is not available. Most of the estimates indicate about 65 percent Indian, 5 to 10 percent white, and the remaining mixed or cholo (1, p. 64). This classification, which is a legacy of the colonial Spanish social order, has lost its biological significance. Today it would be more appropriate to speak of only two groups: Mixed and Indian. This is particularly true of the highlands and valleys regions where racial intermixture makes distinctions blurred or arbitrary. In retrospect, however, the division into three groups is necessary inorder to understand the economic structure of the population. The Indians constituted the agrarian and mining labor classes exploited by the white minority that historically ruled the entire country in its own interests.

The Economy

In Bolivia, as in all Latin American countries, exports of primary products have assumed considerable importance since colonial times. As a result, Bolivia has a traditional economy characterized by the outward directed growth model. The main feature of this model is its specialization. In the 1925-29 period, minerals represented over 93 percent of the value of exports with tin reaching nearly three quarters of the total (16, p. 62). This fact plus ownership concentration of mining in three private groups had detrimental effects on the economic development of the country. These were reflected principally in the small capitalization of the economy caused by the uncontrolled remittance of profits and the scant integration of the mining sector with the rest of the economy. As a result the expansion of mining activities did not have any appreciable effect on the situation and traditional relationships of agriculture and other sectors (16, p. 63).

The year 1952 marked a change in the economic and social life of the country. The revolutionary government established by the M.N.R.[1] party launched an economic policy whose major objectives were: nationalization of large scale mining, agrarian reform, sectorial diversification, and geographic integration of the country (16, p. 65).

Table 1 is useful to reveal several aspects of the Bolivian economy today. It consists of national accounts estimated for Bolivia for the years 1962-1965 at current prices. The table reveals the relative

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[1]Movimiento Nacionalists Revolucionario

Table 1. Bolivia: National accounts[a], 1962-1965

	1962	1963	1964	1965
		million $bs		
Private Consumption				
Total	4,411.00	4,799.00	5,064.00	5,470.00
Per capita	1.14	1.21	1.25	1.32
Percent GNP	82.80	83.90	78.20	76.10
Public Consumption				
Total	492.00	553.00	614.00	812.00
Percent of GNP	9.20	9.70	9.50	11.30
Gross Capital Formation[b]				
Total	876.00	909.00	1,009.00	1,246.00
Percent of GNP	16.40	15.90	15.60	17.30
Exports	876.00	996.00	1,337.00	1,544.00
Imports	1,328.00	1,521.00	1,519.00	1,842.00
Export deficit	-452.00	-525.00	-182.00	-298.00
Net payments abroad	----	-15.00	-32.00	-38.00
GNP at market prices				
Total	5,327.00	5,721.00	6,473.00	7,192.00
Per capita	1.38	1.45	1.60	1.74
Average annual rate of growth over 1962		7.40	10.80	11.67

[a]In million pesos at current prices.

[b]Includes changes in stock.

Prepared from United Nations, Yearbook of National Accounts, 1966; and Cepal, Sinopsis de Datos, Estimaciones y Proyeccion Demograficas, Bolivia, 1962.

composition of aggregate expenditures. On the average, private consumption has been about 80 percent of Gross National Product (GNP) over the period. The rise in the share of public consumption, reflects in large part the massive diversification effort undertaken by the government since 1952. The most striking fact to emerge from Table 1 is the size of imports. In 1965 they amounted to over 25 percent of the GNP. This was partly due to the small contribution of the agricultural sector in meeting the domestic food demand.

Thus, agriculture, engaging some 72 percent of population, contributed 32 percent to the GNP (1, p. 447). Only two percent of the 33 million hectares (82 million acres) of farmland in the country were cultivated (12, p. 3). This plus the predominately subsistence character of agriculture and its little diversification make imperative the import of agricultural commodities. In 1965 agricultural products[1] accounted for 25.7 percent of the total value of imports. Thus, the availability of foreign exchange was crucial in determining the food price level. This effect was even greater considering that low and medium income urban families spent over 50 percent of their income for food (19, p. 18).

A greater use of the untapped agricultural resources in the country would reduce the food pressure on imports. This would release much needed foreign currency for the capitalization of the economy through the import of capital goods. The net effect of the process would be to accelerate the annual rates of growth which are not as respectable as the table suggests due to effects of inflation.

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[1]Mostly wheat, wheat flour, lard, milk, beverages, and livestock.

The Agricultural Sector

Before the land reform the agrarian system in Bolivia, as still is the case in other Latin American nations, was characterized by feudal forms. Most of the land was held in large estates or latifundia. A census in 1950 disclosed that 6.3 percent of the land owners possessed 91.9 percent of the farmland. On the other side of the scale were 76.2 percent of the farmers who possessed less than one percent of the farmland in holdings of less than 20 hectares. The extreme inequality in land ownership is further illustrated by the fact that 615 farms (less than one percent of all holdings) accounted for 49.6 of the total farmland. The size of each of these farms was over 10,000 hectares (12, p. 4).

The darkest characteristic of the system prior to the agrarian reform, however, was not the owner-land relationship but that of the landlord-labor. Ownership of a hacienda conveyed to the landlord not only rights over the land but also over the peasantry which for all practical purposes was considered part of the hacienda. The landless peasant, in order to have access to any land and thus gain his livelihood, had to provide free services to the landlord. These services consisted not only of farming but also transportation of the produce to the consumption centers, and household work in the urban residence of the landlord or wherever they were located. In some cases a tributary system was established in favor of the landlord.

This system of exploitation was such that sometimes the peasant, unable to meet all his obligations to the landlord, had to contract

additional help at his own expense. In exchange for all of these the peasant was entitled to some land and seed for his subsistence crops (2, pp. 2-6).

It is appropriate to note that not all the agrarian peasantry lived under this serfdom system. There were communities that maintained their independence since pre-colonial times and others that acquired it later. Their effect in the national economy, however, was insignificant since they lived in a social, economic, and cultural world which was sharply isolated by their boundaries (1, p. 81).

The land tenure system was a major obstacle to the development of a progressive agriculture. Its crudeness was reflected not only in the economic activity but more sadly in the human aspect. Thus, the anthropologist Baundelier, could write a few decades ago of the Altiplano peasants:

> "Cupidity, low cunning, and savage cruelty are unfortunate traits of the Indian's character . . . The Aymara Indian is not at all stupid, but the degree of intelligence he possesses seems to be used mostly for evil." (1, p. 81).

Since man, in general, is a product of his social and economic environment, it is not extraordinary that this feudal system may have produced individuals such as those described. The changes brought by the agrarian reform are proof, however, that these were not innate nor dominating characteristics of the peasants.

This study of the Aymara community of Achica Bajo should be understood in the light of the preceeding background. It is not an attempt to demonstrate how much change the agrarian reform has produced in a rural community. The lack of measurable points of reference makes

an economic evaluation of this sort impossible. Besides, having been an organized community prior to the agrarian reform, Achica Bajo was not directly affected by it. The overall goal of this study is simply to describe the measurable socio-economic reality of an Altiplano community. By so doing, the author hopes to contribute some information on the social and economic emancipation of the group of people which comprises Achica Bajo.

THE COMMUNITY

Achica Bajo is an Altiplano community located in Province[1] Ingavi of the La Paz Department at an altitude of 3,800 meters (12,464 feet)[2] over sea level. It was founded in 1929 with the purchase of a hacienda that had belonged to the Lanza family. The community lays on an open plain 15 kilometers east of the town of Viacha, approximately 64 kilometers from the city of La Paz. The entire community comprises an area of about 700 hectares in the shape of a boot and is bounded entirely by other communities. The community is divided into three zones denominated Mayta, Casas and Coitofina. It has a population of 594 permanent residents. The Achicabaquenos racially are Aymara Indians with some Quechua influence. While everybody speaks Aymara, a good proportion also speaks Spanish.

The pattern of settlement in Achica Bajo is typical of an Altiplano community. The houses of the farmers or campesinos are scattered all over the community near the land they work. They are usually in compounds of two or three small rooms plus some animal yards built of adobe or tapial walls. The school and the cooperative buildings constitute the center of the community. There is no electricity nor a water distribution system, neither are there roads to the outside. Only two trails lead out of the community that can be

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[1]A political subdivision that would lie in the United States between county and state

[2]Refer to measures conversion table

used by trucks during the dry season. Campesinos generally walk to the nearby town of Viacha, where there is a regular bus service to La Paz and other distant points. For short distances bicycles and burros are used as transportation.

The most important factor influencing the fortune of Achica Bajo is the proximity of the city of La Paz. The city provides an extensive market for specialized cash crops. Its commercial, industrial and especially construction enterprises are key sources of employment and provide cash income for members of the community. Earning power, thus supplemented, allows Achicabaquenos a scale of living beyond the grasp of campesinos in more isolated areas. It should be noted, however, that the influence of the business-urban environment of La Paz is a latter-day phenomena. These relative advantages are still in an emergent stage. They clearly typify the economic consequences of the removal of social and cultural barriers accompanying the agrarian reform.

Another influential element is the town of Viacha. Achica Bajo's location places it, by campesinos standards, within walking distance. Viacha is an important railroad center. It is the junction point of the domestic line, La Paz-Oruro, and the international lines to Puno (Peru) and Arica (Chile). As a matter of fact, the truck line to Oruro crosses the community. Since the capital of La Paz is so near, most Achicabaquenos prefer to transact business there rather than in Viacha. The town, however, constitutes their cultural center through its church, fairs and political and social activities.

Campesinos of Achica Bajo have an ambivalent attitude toward their community; for while they feel that it does not offer many

income opportunities, they, nevertheless, are proud of it. Recent community improvements such as the new school building, the sheep dip, the introduction of small applicances such as radios, and the school marching band with its occasional appearances have been a great help in alleviating the forlorn mood that prevails in most other altiplano communities. The local population, however, still does not fully participate in these activities. But, the air of political and social awareness or concienzacion beginning to be felt in Achica Bajo clearly indicates that major changes, initiated by the agrarian reform, are gaining importance.

Topography

The relief of the community is somewhat typical of the Northern Altiplano although not as fertile as areas closer to Lake Titicaca. It is in its integrity an open plain slightly sloped with practically no rugged terrain. Its only shelter is a not too distant hill lying to the south. Since drainage from this elevation appears to reach bottom within the community there is a sub-terranean water accumulation close to the surface. Moisture from this water table makes the community landscape not so barren and monotonous as in most of the Altiplano. Patches of natural green are not uncommon. There are, however, no trees. The openness of the area makes it quite vulnerable to wind erosion. There is, consequently, little structural development of the soil.

Climate[1]

The main climatic characteristic of Achica Bajo is its daily temperature variation which, during the entire year, is considerably higher that the seasonal (Figure 1), a factor attributable to its high altitude. Thus, for instance, the mean temperature in January, a summer month, is 10.4° C while in June, the coldest month of the year, is 3.0° C (Appendix Table 35). In January, however, the day temperature can reach 23.0° C and at night descent to 1.5° C below zero,[2] while, in June the day high can be 16.5° C with a night low of -13.5° C. These extreme daily variations constitute the most serious obstacle to agriculture. Moreover, they are year around phenomena with no normal frost free period.

Rainfall in the community is not high. The annual rainfall average for the area is 296.6 mm[3] (Appendix Table 35). According to these statistics the precipitation is highly concentrated, a typical feature of the Altiplano in general (Figure 2). Nearly 75 percent of the annual fall is between December and March. The dryest months are in the winter with June, July, and August averaging only one millimeter. The relatively low rainfall associated with the irregular annual timing of the rains and the absence of an irrigation system constitute another major disadvantage to agriculture in the community. This pattern is

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[1]Data presented in this section corresponds to the Meteorological Station at Viacha.

[2]Refer to Measures Conversion Table.

[3]Ibid.

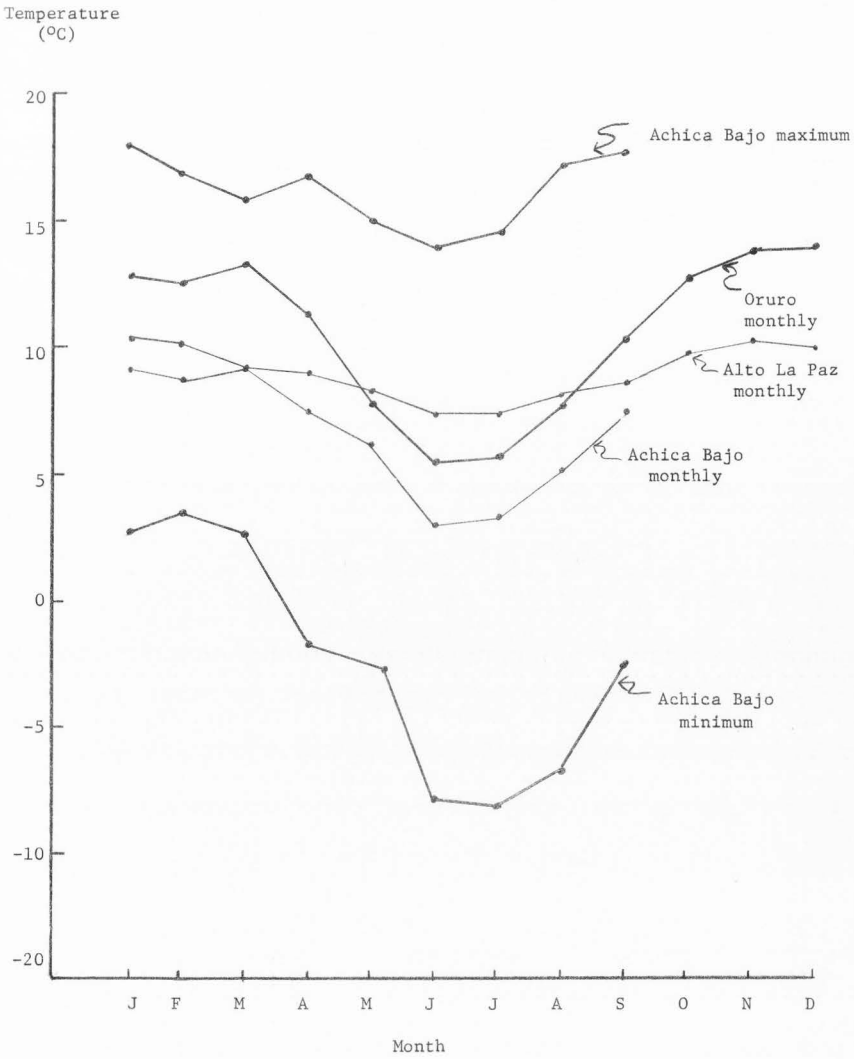

Figure 1. Comparative temperature summary of three Altiplano regions, monthly averages, 1966-1967.

Source: World Weather Records, US Department of Commerce and Department of Meteorology, Bolivian Ministry of Agriculture.

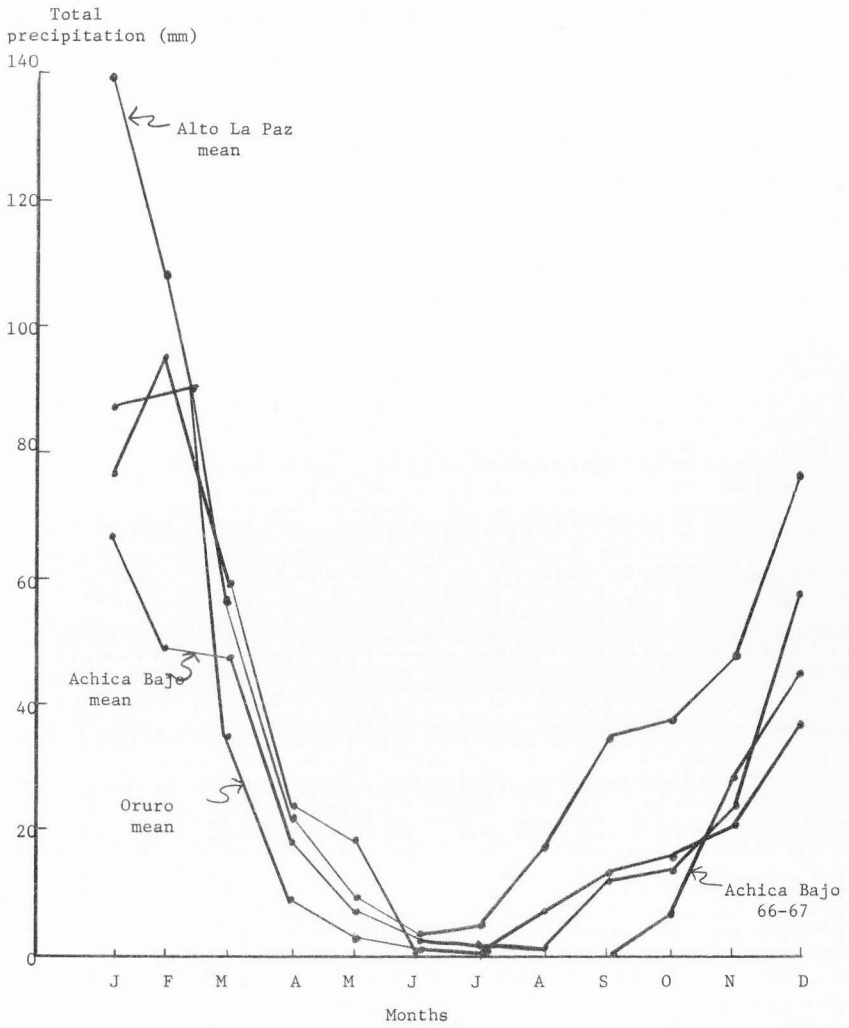

Figure 2. Comparative rainfall summary of three Altiplano regions, monthly averages, 1957-1966

Source: World Weather Records, US Department of Commerce and Department of Meteorology, Bolivian Ministry of Agriculture.

observable in the figures for the year 1966. The tardiness of the rains in that year resulted in more than four months of complete dryness. This delay had a disastrous effect on crop production as will be shown later.

Soil

The soil of Achica Bajo, as that of the entire Altiplano, has a sedimentary origin. It is formed principally of sand, clay, and coarse gravel. It has a soft composition that makes it highly susceptible to erosion. But despite the strong wind erosion that affects the area, the soil is fairly deep. Tillage, except in some tracts that have not been cleared of rocks, is not difficult. The soil in general is neutral to slightly alkaline with high salt concentrations near the surface. There is not a lack of organic matter. Differences in soil types, however, are marked within the community. Simple observation of the pattern of cultivation indicates areas of unproductive soil due to their high salt contents. A complete analysis of the soil made during the survey is in Appendix Table 36.

Vegetation

Observation of the vegetative cover suggests that overgrazing is a serious problem in Achica Bajo. The terrain is sparsely covered by coarse grasses and shrubs. Despite their toughness and dryness these plants constitute the only feed available for sheep.

The native forage has serious nutritional deficiencies. Because of this the potential carrying capacity is far below that actually observed. No artificial pasture lands were seen or reported during the survey.

HUMAN AND SOCIAL DATA

This part deals with the human aspect of Achica Bajo. It attempts to provide a general idea of the demographic and social situation of the community. Although a detailed analysis is not intended here, the simple presentation of basic demographic data such as size of population and sex age composition for a Bolivian rural community are significant in light of the lack of official data.

The human aspect can hardly be overemphasized in a community socio-economic study. Residents of the community constitute the economic factor that organizes and carries its other economic activities. Above all, and in the strict sense of economics and sociology, the satisfaction of their needs is of prime importance. Consequently, an efficient formulation of community development programs requires a clear picture of the relationships between population and factors such as food, health, land, agricultural equipment, education and infrastructure. Similarly, a true evaluation of a community development program implies to judge its effects in terms of the real impact on the people of, for example, changes in the quantity of seed used, or productivity changes brought by technical assistance.

The information for this section was obtained by taking a census of the entire population. Because there is not a registration of vital statistics for the community, the data obtained are not wholly accurate. Checks introduced in the questionnaires indicate, however, that the census generated reasonably reliable information.

Population Characteristics

Size

According to the study, the population of Achica Bajo in 1967 was 594 persons, making up 126 households. These figures excluded three families which had farms in the community but maintained residence elsewhere. The entire population of the community is rural. Of the three zones into which Achica Bajo is divided, Mayta zone is the most heavily populated with 275 persons; next is Casas with 187; and last, Coitofina with 131 persons. The demographic density of Achica Bajo is about one person per 1.3 hectares.

Age distribution

The age pyramid of Achica Bajo has a wide base and a low apex with a very marked gap in the 20 to 34 age groups (Figure 3). All of which is typical of a community with high birth and death rates plus considerable out-migration in the early productive ages. The relative youthfulness of the population, a characteristic of underdeveloped rural groups, is striking. Over 50 percent of the population of Achica Bajo was under 20 years of age (Table 2). This extreme concentration in the early age groups would be even higher if it were not for the extremely high infant mortality rate. Thus, the elimination of some of the conditions responsible for infant mortality could increase the age group 0-9, from its present 27 percent, to over 30 percent of the total population.

A comparison of the age structure of the community population to the national total confirms the pattern indicated above.

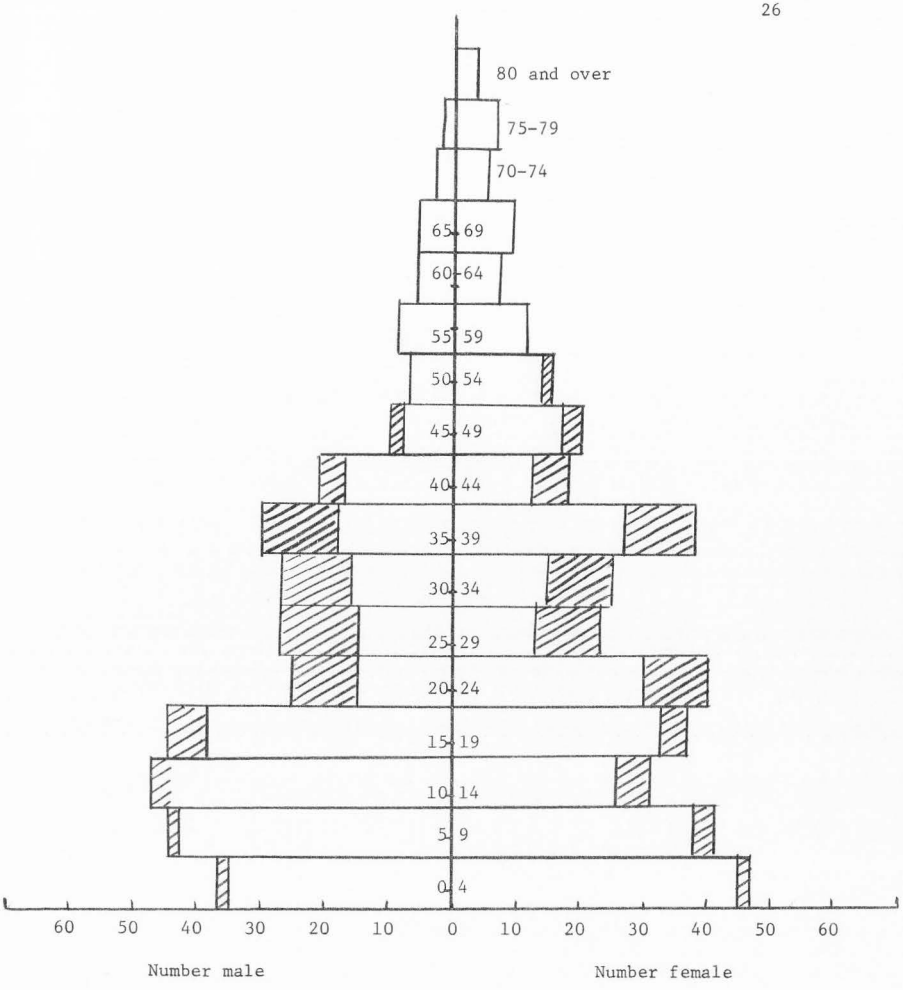

Figure 3. Sex and age pyramid for the community of Achica Bajo, 1967

Population Recorded migration

Table 2. Distribution of the population of Achica Bajo, by age and sex, 1967

Age	Males		Females		Total	
	Number	Percent	Number	Percent	Number	Percent
0 - 4	35	12.4	45	14.5	80[a]	13.5
5 - 9	43	15.2	38	12.2	81	13.6
10 - 14	44	15.5	26	8.4	70	11.8
15 - 19	39	13.8	33	10.6	72	12.1
20 - 24	15	5.3	30	9.6	45	7.6
25 - 29	15	5.3	13	4.2	28	4.7
30 - 34	16	5.6	15	4.8	31	5.2
35 - 39	18	6.4	27	8.7	45	7.6
40 - 44	17	6.0	12	3.9	29	4.9
45 - 49	8	2.8	17	5.5	25	4.2
50 - 54	7	2.5	14	4.5	21	3.6
55 - 59	9	3.2	11	3.5	20	3.4
60 - 64	6	2.1	7	2.2	13	2.2
65 - 69	6	2.1	9	2.9	15	2.5
70 - 74	3	1.1	5	1.6	8	1.3
75 - 79	2	.7	6	1.9	8	1.3
80 and over	0	--	3	1.0	3	.5
TOTAL	283	100.0	311	100.0	594	100.0

[a]Nine of which were under one year of age.

Achica Bajo has relatively fewer children under 5 years of age than the country as a whole (Table 3). This implies a higher infant mortality rate for the community. The percentage in the male group, 15 to 64, is lower than the national, which seems to indicate considerable migration in the productive ages from the community.

The high infant mortality rate in Achica Bajo can be easily illustrated. Figures for rural groups under age 5 indicate that Achica Bajo comes closer to the United States than Peru and Brazil (Table 3). The important distinction in this comparison is that birth control programs are unknown in the three South American countries while not in the United States. Thus, the relative low proportion in this age group in Achica Bajo can consequently be explained only by a high rate of infant mortality.

On the basis of the information collected, the economic dependency ratios for Achica Bajo are calculated at 73.1 for the youth dependency ratio (Y.D.R.) and 14.9 for the aged dependency ratio (A.D.R.).[1/]

Sex composition

The distribution of the sexes in Achica Bajo indicates that women greatly outnumber men (Figure 3). The sex ratio of 91.0 (males per 100 females) for the community reveals an unexpected preponderance of females especially for a rural community. This disproportion seems to be accounted for by two factors. One is a relatively high mortality

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[1/] $\text{Y.D.R.} = \frac{\text{Pop. under 14}}{\text{Pop. 15 - 59}} \times 100$

$\text{A.D.R.} = \frac{\text{Pop. over 60}}{\text{Pop. 15 - 59}} \times 100$

Table 3. A comparative distribution of population by sex and age of Achica Bajo and selected countries[a]

Place	Percents									
	Male					Female				
	All ages	Under 5 years	5-14 years	15-64 years	65 plus years	All ages	Under 5 years	5-14 years	15-64 years	65 plus years
Rural										
Achica Bajo	47.6	5.9	14.6	25.3	1.8	52.4	7.6	10.8	30.1	3.9
Peru	49.6	9.0	14.0	24.8	1.9	50.4	8.9	13.2	25.8	2.3
Brazil	51.5	8.9	14.8	25.5	2.3	48.5	8.4	14.0	24.2	2.0
United States	51.0	5.9	11.2	29.4	4.5	49.0	5.7	10.7	28.1	4.5
Total										
Bolivia	49.0	8.0	12.4	26.6	2.0	51.0	7.8	11.5	29.5	2.3
United States	49.3	5.8	10.0	29.3	4.2	50.7	5.6	9.7	30.4	5.0

[a]Source: United Nations, Compendium of Social Statistics, 1967.

rate for males. This assumption is supported by the fact that the excess of females is marked after the age 45. The other cause may be the fact that more men leave the community for work in the urban and mining center. Still another explanation for the sex disproportion could be the fact that when a member of the community marries an outside girl, she becomes part of the community. This privilege is restricted by tradition only to the men. It is reasonable to suspect, however, that the effect on sex composition is cancelled by a corresponding drain of community girls to other communities.

It is interesting to note a curious pattern observable in the sex distribution of Achica Bajo, which also appears in a similar study of a tropical area of Bolivia (10, p. 3). In the age group, 0-4, the percentage of females is considerably larger than males. In the following three groups, however, the trend is reversed with males outnumbering females. The only explanation seems to be a greater care of the male children after their first few years. Strong support is given to this assumption by the greater value that primitive communities generally give to males.

Place of birth

In the absence of an official registration system, it is difficult to determine place of birth of Achicabaquenos. The population census obtained this information for household heads. Only 12 of the 125 heads claimed to have been born outside the community. Of these, four were born within Ingavi Province, the next political division. This indicates that Achica Bajo is a relatively closed community.

Residence

The population of Achica Bajo maintains stable residence within the community. The census indicates that only 17 of the household heads had maintained residence elsewhere in their lifetimes.

Marital status

A classification of the population 15 years of age or over according to their marital status indicates that there are 129 single persons, 195 married and 39 widows. No provision was made in the survey for divorced or separated, since these classes lack significance in communities such as Achica Bajo. Contrary to our expectations, the campesinos of Achica Bajo do not marry at young ages. Only one male and two females in the age group 15-19 were married (Table 4). The proportion is even more surprising in the 20 to 29 age group with only 56 percent of the females and 50 percent of the males married. The fact that land can be obtained almost exclusively through inheritance makes the young highly dependent on their parents. This appears to be a factor against early marriage.

Table 4. Population of Achica Bajo cross classified by sex-age composition and marital status, 1967

Years of age			20-29 years		30-39 years		40-49 years		50 and over years	
	Male	Female	M	F	M	F	M	F	M	F
Marital status										
Single	38	31	15	19	5	12	0	5	0	4
Married	1	2	15	24	29	28	25	22	27	22
Widowed	0	0	0	0	0	2	0	2	6	29

Another highly significant characteristic of the marital classification of the population in Achica Bajo is the widowed group. There were merely 6 widowers against 33 widows indicating that life expectancy is much lower for males than females. Another cause for this phenomenon is that upon death of a spouse, men generally re-marry. It must be noted that the marital status indicated does not reflect legal aspects.

Race

The population of Achica Bajo is formed by a homogeneous group of Aymara Indians. Mestizos, known as cholos were not found to reside in the community.

Religion

Approximately 75 percent of the campesinos of Achica Bajo indicated that they were Roman Catholics. About 10 to 15 percent had become Protestants of the Baptist denomination during the last decade. The remaining were either not religious or were not sure of their faith. An interesting characteristic of Achica Bajo is the absence of a church building which in most Altiplano communities constitutes the center. Apparently all of the worship practices are conducted in the town of Viacha.

Language

The native tongue of campesinos in Achica Bajo is aymara. An increased participation in dealings outside the community, principally in the city of La Paz, appears to have expanded the knowledge of

Spanish in the community. Thus, 312 persons or 53 percent of the total population spoke Spanish. Only 4 persons reported knowledge of quechua, the other dominant Indian tongue in Bolivia.

Population Change

A discussion of community development, or the prospects of a rise in the levels of living of any group, must begin with an appraisal of the number of people involved. It is not only the present size of the population, however, that is an important detum, but also its potential future size in relation to the available resources and their utilization.

A population changes in size as a result of the net effect of births, deaths, and migration. In the absence of an adequate system of vital statistics, as in Achica Bajo, it is futile, if not impossible, to measure accurately birth and death rates. As a result of this obstacle, so common in the less developed countries, population statisticians have developed various methods to measure the fertility of a population (11, p. 241). One of these is known as the fertility rate. It indicates the ratio between the number of children under 5 years of age in the population to the number of women in the years of fecundity, 15 to 49. This method, in addition to being more reliable than the crude birth rate, has other advantages (18, p. 87). One is that it does not depend on the registration of births. Second, it is very useful in the absence of refined birth rates in group comparisons. All that is required is a census with the necessary age-sex breakdown.

Fertility

For the reasons annotated above the fertility rate is the best reproduction indicator for the community of Achica Bajo. It was calculated at 544[1], from which it can be inferred that the community has a reproduction quota above its replacement needs. Thus, in countries experiencing population growth such as Panama and the United States similar rural ratios of children to women are 524 and 539 respectively (3, p. 235). It is difficult, however, to infer from these comparisons a birth rate for Achica Bajo. The limitation is that fertility rates do not take into account early infant mortality which as later discussed seems high in the community.

Mortality

To compile accurate mortality rates for Achica Bajo was a task beyond our possibilities. Since there was not official data in the community, this information could have been obtained only from each individual family. It was realized earlier in the survey that questions regarding infant mortality are embarrassing since women responding, generally related them to pregnancies. For this reason no attempt was made to obtain these data directly from each household. Through guesses of third persons and information provided by community leaders, however, it was estimated that approximately 17 babies were born in the 12-month period that preceeded the population census. Deducting from these the 9 children under one year of age who were still alive at the

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[1]Fertility rate: $\left(\frac{\text{No. of children under 5}}{\text{No. of females 15 - 49}} \times 1000\right) = \frac{80}{147} \times 1000 = 544$

time of the census, 8 infant deaths were established for the year. This would give an infant mortality rate of 471 (Table 5). A very high rate indeed considering that stillbirths are also common in Achica Bajo. For Mexico as a whole the infant mortality rate was calculated at 60.7 in 1965, for the United States at 24.7 in the same year (3, p. 152). This illustrates the extent of infant mortality in Achica Bajo.

According to the same informants, there were 5 more deaths in addition to the infant deaths. This indicates a crude death rate of 22.2 for Achica Bajo (Table 5). This demographic indicator for the community is highly understated in light of the rate for the entire country, which was about 40 during the period 1960-64 (3, p. 143). A more precise idea can be had of the mortality levels in the Altiplano in general by observing Appendix Tables 37 and 38. These two tables were prepared from information obtained by the author in the Altiplano community of Lacapucara[1]. The decision to include these data was made by the author not to suggest the same sad situation for the community of Achica Bajo. The appearance of both communities makes this unlikely. The tables were enclosed to illustrate the tragic reality of most Altiplano campesinos living in even more remote communities than Achica Bajo.

Growth

Information obtained from older people in Achica Bajo suggests that the population of Achica Bajo has increased considerably during

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[1]Situated in Provincia Cercado, Dept. Oruro. Lacapucara was a hacienda until the agrarian

Table 5. Estimation of various population parameters[a] for Achica Bajo, 1967

Crude Brith Rate:

$$\frac{\text{Births in one year}}{\text{Population at mid point of year}} \times 1000 = \frac{17}{585} \times 1000 = 29.1$$

Crude Death Rate:[b]

$$\frac{\text{Total deaths in a year}}{\text{Population at mid point of year}} \times 1000 = \frac{13}{585} \times 1000 = 22.2$$

Infant Mortality:

$$\frac{\text{Deaths of children under one year}}{\text{Births in the year}} \times 1000 = \frac{8}{17} \times 1000 = 471$$

Vital Index:

$$\frac{\text{Crude birth rate}}{\text{Crude death rate}} \times 100 = 131$$

Natural Rate of Increase = Crude Birth Rates - Crude Death Rate = 6.9

[a]Based on oral information provided by community leaders.

[b]Includes infant mortality.

the last few decades. The high proportion of children in its population supports this view. Thus the percentage of children under 15 years of age in Achica Bajo (38.9 percent) comes closer to the percentage of Latin American countries known to have high birth rates than those known for their low birth rates. Among the former are Mexico (41.6 percent) with a crude birth rate of 46.0 in 1960 and Venezuela (42.1 percent) with a crude rate of 45.1 in the same year. On the other hand is Argentina whose lower proportion of children under 15 years (30.9 percent) corresponds to a lower crude birth rate, 23.7 in 1958 (14, p. 75).

The rough indicators of Table 5 also suggest that the population of Achica Bajo, excluding migration considerations, is growing, but not at an excessive rate. A crude birth rate of 29.1 and a crude death rate of 22.2 imply a rate of natural increase of 6.9 and a vital index of 131. A vital index value over 100 indicates immediate growth for a population (18, p. 88). On this basis, again, one concludes that the population of Achica Bajo is growing. The birth and death rates calculated, however, are not wholly accurate. This is because the number of births quoted by the leaders indicates just those which became known in the community. Since matters of pregnancies are always surrounded by privacy, it is too much to expect that the data provided accurate information on the subject. For this reason projections on the expected size of the population in the future are not made. It can be stated, however, that the removal of some of the causes responsible for the high infant mortality could produce considerable changes in the size of the population in Achica Bajo.

Migration

Another demographic datum useful to an understanding of the social and economic situation of a community is provided by migration flow. Some information on migration was obtained through the population census (Table 6). Such data are not complete. The extent of migration is much greater than the table suggests. The table enumerates only sons and daughters plus their respective spouses and children who have moved out of the community but still have at least one parent maintaining the household of which they were part originally. A complete count of out migration would have had to include entire households that left the community and also out migrants which no longer maintain a direct connection with the community. In the absence of written records, a total count of out migration was impossible. To make this distinction clear, data gathered on out migration have been called "recorded out-migration". For these reasons and because data may include persons that have migrated only temporarily, no rates of migration can be deducted. The observations below are, consequently, limited by these factors.

Out migration affects most households in Achica Bajo. The 129 out migrants enumerated left from 37 of the 126 parental households in the community. This gives an average loss of 3.49 persons per household affected. As shown in Figure 3, out migration affects mostly the economically productive age groups. Thus, over 67 percent of the recorded migration is from 20 to 39 years of age. Again, as in the case of the entire population, there is a preponderance of females over males in the out-flow. The sex ratio, however, for the migrants (95.5) is higher

Table 6. Distribution of recorded[a] out migration from Achica Bajo, by sex and age

	Males		Females		Total	
Years of Age	Number	Percent	Number	Percent	Number	Percent
0 - 4	2	3.2	2	3.0	4	3.1
5 - 9	1	1.6	3	4.6	4	3.1
10 - 14	3	4.8	5	7.6	8	6.2
15 - 19	6	9.5	4	6.1	10	7.7
20 - 24	10	15.9	11	16.7	21	16.3
25 - 29	12	19.0	10	15.1	22	17.1
30 - 34	11	17.5	10	15.1	21	16.3
35 - 39	12	19.0	11	16.7	23	17.8
40 - 44	4	6.3	6	9.1	10	7.7
45 - 49	2	3.2	3	4.5	5	3.9
50 - 54	--	---	1	1.5	1	.8
TOTAL	63	100.0	66	100.0	129	100.0

[a] Refers to offspring and their families that still have a parental household in the community although they have migrated.

than for the entire population (91.0), which indicates that relatively more men leave the community. The selective character of the out-flow is clearly revealed in Figure 4. Of the total of 129 out migrants, 62 had moved to La Paz, 36 to the town of Viacha, 9 to the yungas and the remainder were scattered in nearby communities. The principle inference is that recorded out migration involved small distances. Migration into the community appears not very significant, consisting exclusively of outside women marrying members of the community.

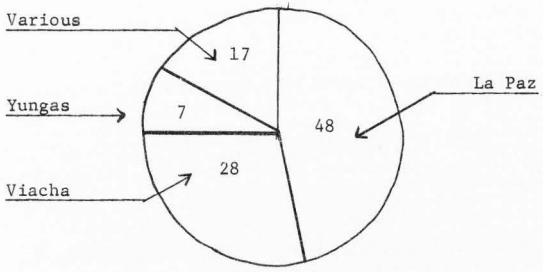

Figure 4. Percentage of recorded out migrants residing in selected regions, 1967

Educational Characteristics

Some further comprehension of characteristics of the population of Achica Bajo can be obtained from educational data collected. This becomes highly important because education constitutes an indicator of the standard of living of the community (6, p. 33). Also because it is one of the crucial determinants of social and economic development.

The findings of the census with respect to education suggest that the educational level of Achica Bajo is quite high for an Altiplano rural community. As computed from Table 7, 62 percent of the population of Achica Bajo 7 years of age or over had received at least one year of formal schooling. This is even more impressive in regard to males, 79 percent of whom had schooling a year or more. The corresponding figure for the female population (46 percent) indicates the typical Latin American characteristic of considerably more males than females receiving education. The same trend becomes clearly illustrated in Figure 5. It shows that in the group with no schooling at all, there were 21 percent of the males versus 53.6 percent of all females in the same group. Also, it is interesting to note the disproportionate number of males 7 to 14 years of age relative to those 15 to 24 with no schooling. An analysis of the data suggests that this figure is inflated by the many boys who begin school after the age of seven.[1] Another reason was given by some parents interviewed. In poor years families appear to delay school attendance of the youngest. This was the case during the 2 or 3 years preceeding the census.

Figure 5 shows also that males have a tendency to attend school for longer periods. Thus, only one female had gone beyond primary school versus eight males.

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[1]By law, elementary education in Bolivia is compulsory for children 7 to 14 years of age (21. p. 2).

Table 7. Population[a] of Achica Bajo cross classified by age and years of schooling, 1967

Years of Age	Years of schooling										
	None		1-2		3-4		5-6		over 6		
	Male	Female	M	F	M	F	M	F	M	F	Total
7 - 14	13	19	29	18	22	6	6	0	1	0	114
15 - 24	2	15	4	37	25	11	20	0	4	0	118
25 - 39	7	17	5	26	32	10	5	1	0	0	103
40 and over	27	83	11	2	16	4	1	0	3	1	148
TOTAL	49	134	49	83	95	31	32	1	8	1	483
Percent	10.1	27.7	10.1	17.2	19.8	6.4	6.6	.2	1.7	.2	100.0

[a]Population under 7 years of age not considered.

Literacy

In order to check information collected on educational level, a question was introduced in the population questionnaire to determine the percentage of the population of Achica Bajo who could write.[1] Again, the results are high and tend to confirm our above assertions on schooling. The literacy rates computed indicated that 58.8 percent of the population 7 years or over could write (Table 8). The corresponding values for males and females were 75.5 and 43.2 percent respectively.

[1]The criteria used for responding to this question was whether or not the respondent could write his own name.

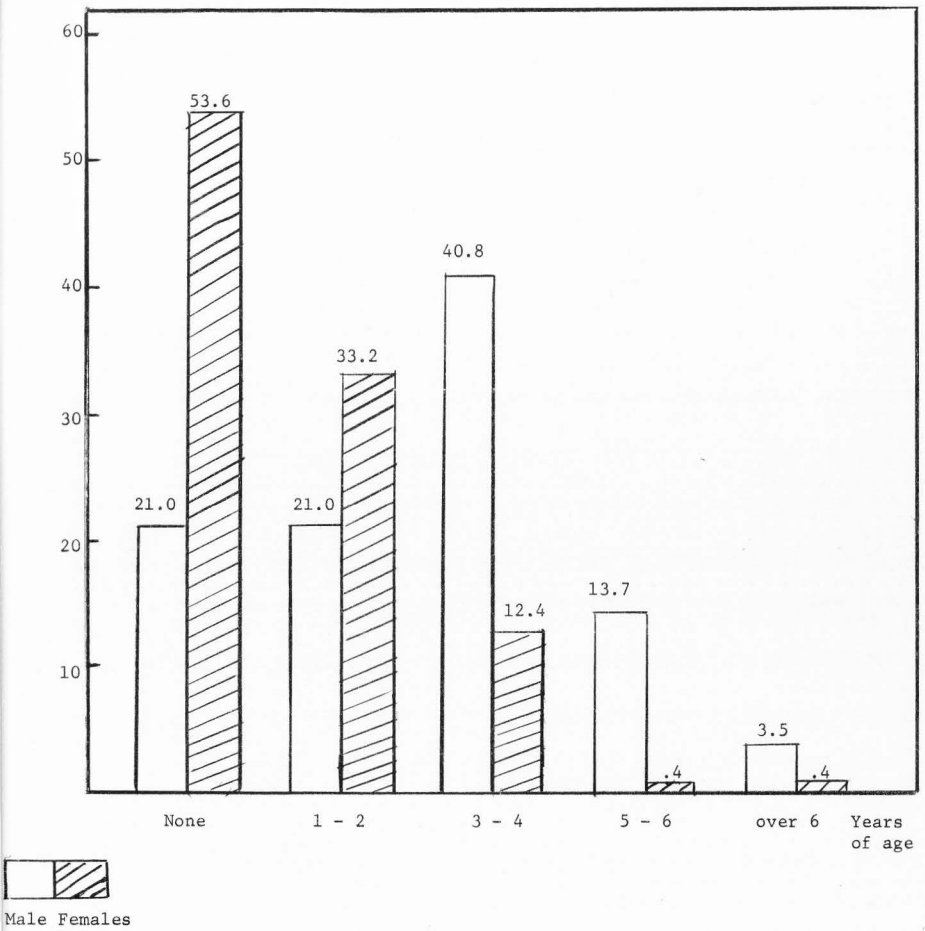

Figure 5. Percentages of each sex population in Achica Bajo by years of schooling, 1967

Table 8. Literacy rate of the population[a] of Achica Bajo by age groups, 1967

Years of age	Males	Females	Both
7 - 14	76.1	51.2	66.6
15 - 24	96.4	7.14	83.1
25 - 39	77.6	61.1	68.9
40 or over	53.4	8.9	26.4
TOTAL	75.5	43.2	58.8

[a]Children under 7 years of age not included

Another interesting educational characteristic of the population of Achica Bajo is shown in Table 9. It indicates that younger people are receiving more formal education. Thus, in the group with no schooling there were 35.6 and 73.7 percent of the husbands and wives respectively. For sons and daughters the corresponding percentages were 30.9 and 55.8 respectively. In the group 3-4 years of schooling again the same trend is observed.

School attendance

Despite the considerable progress made by the community in recent years, education is far from being available to all the children of Achica Bajo. Table 10 indicates that only 52.6 percent of the children 7 to 14 years were attending school at the time of the survey. The male attendance in this age bracket was 64.8 percent while for females

it was only 32.6 percent. About 40 of the 60 children in this group were attending the local community school. In the age group 15 to 19 the percentage of school attendance was 42.5 for males against 9.1 for females for a total of 27.4 percent. A considerable number of the males in this group attended school in the town of Viacha. This fact, plus the large proportion of children in school age not attending school, clearly indicates that local educational facilities are far from being adequate to the needs of the community.

Table 9. A classification of kinship by years of schooling, Achica Bajo, 1967

Kinship	Years of schooling completed					
	None	1-2	3-4	5-6	over 6	Total
Husbands	35.6	16.7	40.0	4.4	3.3	100.0
Wives	73.7	16.2	8.5	0.8[a]	0.8[a]	100.0
Sons	30.9	17.6	33.3	15.8	2.4	100.0
Daughters	55.8	33.3	10.9	0.0	0.0	100.0

[a]Indicates only one case.

Table 10. School attendance in Achica Bajo, 1967

Year of Age	Percentage attending school		
	Male	Female	Both
Under 7	0.6	0.2	0.4
7 - 14	64.8	32.6	52.6
15 - 19	42.5	9.1	27.4
20 and over	0.9	0.0	0.4

Schooling of out-migrants

Table 11 shows years of schooling of the recorded out-migration by age. Comparing the percentage in each of the schooling groups with those of Table 7 it is inferred that those who emigrated show a tendency to have more schooling than those who stayed in the community. Thus, less than one percent of the males 7 years or over who migrated had no schooling, while for people in the community the corresponding figure was 10.1 percent. The same can be said for the females and other years of schooling groups. The higher level of education that recorded emigration appears to have may be explained by the fact that they represent a younger group than the entire population.

Table 11. Recorded migration from Achica Bajo cross classified by age and years of schooling, 1967

Years of age	Years of schooling										
	None		1-2		3-4		5-6		over 6		
	M	F	M	F	M	F	M	F	M	F	Totals
7 - 14	0	0	3	4	0	2	1	1	0	0	11
15 - 24	0	1	2	9	6	3	7	1	0	0	29
25 - 39	0	11	12	13	14	7	5	2	2	0	66
40 and over	1	5	2	3	1	2	1	0	1	0	16
TOTAL	1	17	19	29	21	14	14	4	3	0	122
Percent	.8	13.9	15.6	23.8	17.2	11.5	11.5	3.3	2.4	0	100.0

Occupational Structure

The brief sketch of the occupational structure of the population of Achica Bajo shown below should be related to the community level of income discussed later. Since it was common to find persons that held more than one job during the year, the census reflects primary occupations. Thus, campesinos who dedicated most of the year to their land and livestock activities are listed as farmers. This was despite the fact that in many cases they had non-agricultural seasonal employment. The same applies to the housewives group. In general, women when asked about their occupation responded labores de casa. This answer, however, is misleading since in Achica Bajo, as in other rural areas of Bolivia, the women are farm workers and also participate in commercial weaving and other minor business. The terms agricultor and labores de casa, consequently, reflect mainly the attitudes of the respondents toward their occupational status.

The occupational structure of Achica Bajo appears in Table 12. The occupations are listed in Spanish to reflect the terminology used in Achica Bajo. As might be expected, the major portion of the males (19.7 percent) were agricultores, of the females(36.3 percent) were labores de casa. Another important group was children attending school (17.0 percent). Most of the remaining occupations were related to work outside the community. These contrary to those inside the community, brought direct cash revenue into the community. The "no occupation listed" class was constituted almost entirely of children not attending school. The data are not to indicate levels of employment. Listing an occupation does not necessarily mean employment in rural communities such as Achica Bajo.

Table 12. Population[a] of Achica Bajo cross classified by occupations and age distribution, 1967

Occupation[b]	Age groups											Percent
	7 - 14 year		15 - 19 year		20 - 39 year		over 39 year		All ages			
	M	F	M	F	M	F	M	F	M	F	Both	
Agricultor	2		12		33		44	3	91	3	94	19.7
Labores de casa		5		25		71		72		173	174	36.3
Obrero			5		4	1	1		10	1	11	2.3
Oficinista			2						2	0	2	.4
Comerciante				1	7	10	4	6	11	17	28	5.9
Jornalero			2	1	13	2	7	3	22	6	28	5.9
Escolar	46	14	17	3	1				64	17	81	17.0
Various			1		5		2		8	0	8	1.6
No occupation listed[c]	23	24		3	1	1			24	28	52	10.9
TOTAL	71	43	39	33	64	85	58	84	232	245	477	100.0

[a]Seven years of age or older.

[b]Occupations are defined in the glossary.

[c]It does not represent necessarily unemployment.

Occupations of household heads

Again agriculture and housework were the most common occupations (Table 13). Of all heads of households in Achica Bajo 51 percent dedicated most of their time to their own farms. The 26 percent who claimed housework as occupations were women mostly widowed who run not only their house but also their farm. The remaining 23 percent of household heads were daily laborers, business men, or wage earners.

Table 13. Occupations of household heads, Achica Bajo, 1967

Occupations	Number	Percent
Agricultores	64	51
Labores de casa	33	26
Jornaleros	13	10
Comerciantes	9	7
Obreros	7	6
TOTAL	126	100

Occupations of recorded out-migration

In an attempt to determine the type of activity in which out-migrants were engaged, parents were asked about the current occupations of their children who had migrated. Table 14 summarizes the information gathered. An analysis of the data suggests that non-agricultural occupations absorbed most of the migration outflow. Thus, only 6.6

percent of the emigrants worked in farming. Jobs, such as obreros and jornaleros, which together account for almost 28 percent of the out-migration, constituted an important labor pull away from the community.

Table 14. Recorded out-migration from Achica Bajo classified by occupations and age distribution, 1967

Occupation	Years of age and sex											Percent
	7-14		15-19		20-40		over 40		All ages			
	M	F	M	F	M	F	M	F	M	F	Both	
Agricultores			1		6		1		8		8	6.6
Labores de casa		2		1		33		10		46	46	37.8
Obreros	1				11	2	3		15	2	17	13.9
Oficinistas					4	1			4	1	5	4.1
Comerciantes				1	4	6			4	7	11	9.0
Jornaleros					13	2	2		15	2	17	13.9
Escolares		3	2						2	3	5	4.1
Servicio Militar			4		2				6		6	4.9
Various					1				1		1	.8
No occupation listed	3	2		1					3	3	6	4.9
TOTALS	4	7	7	3	41	44	6	10	58	64	122	100.0

Household Characteristics

There are 126 households in Achica Bajo. The household is the basic social unit in the community. Each household constitutes a clearly

identifiable economic unit, operating as such in production, in consumption, and in tenure of land and livestock. For all these reasons this study adopted it as the elemental enumeration unit. A distinction must be drawn at this point between household and family. Family usually denotes a couple and their children. The concept of household as used in this study makes to considerations of kinship linkage. Thus, 34 households or 27 percent of the households in Achica Bajo included members other than parents and children. Most of these cases were children who had married and had children of their own but remained in the parental household.

Size of households

The mean average size of the 126 households in Achica Bajo at the time of the census was 4.7 members with a standard deviation of 2.33. Including members who had emigrated this average jumped to 5.44 for the 126 households. A better picture of the size of households can be obtained by observing Table 15. It includes a distribution of the current size of households plus another column which indicates the same distribution had no out-migration taken place. Due to space, Tables 39 and 40, which relate to size of households to years of schooling and knowledge of Spanish of heads of households respectively, are presented in the Appendix.

Household assets

From the assets survey, an estimate of the total inventory of purchased durable goods was made for the community and is presented in

Appendix Table 41. The valuation of small items such as silverware was difficult. For this reason an approximate value was set for all minor items.

Some goods which until a few years ago were unknown in the Altiplano, such as radios and sewing machines, were found in Achica Bajo households. The reader should observe the considerable variation that exists among households in Table 41.

Table 15. Distribution of households by size, Achica Bajo, 1967

Number of members in household	Size including migration		Current size	
	Number	Percent	Number	Percent
1 - 2	14	11.1	24	19.0
3 - 4	32	25.4	36	28.6
5 - 6	45	35.7	40	31.7
7 - 9	27	21.4	23	18.3
10 over	8	6.4	3	2.4
TOTAL	126	100.0	126	100.0

Community Organization

No attempt was made during the survey to examine the social and power structure in Achica Bajo. For purposes of our study, however, it is necessary to describe briefly the only two community institutions; the cooperative and the school.

The cooperative

The Cooperativa Agraria has great importance in the life of Achica Bajo. Because the average campesino has little capacity to participate in individual and direct actions to improve his situation, the cooperativa, as the agent of the whole community, assumes this task. As a consequence, the campesinos of Achica Bajo have a notorious consciousness of the important role that the cooperativa plays in their welfare. They may not be yet all active members, but since the agrarian reform opened the doors to them for participation in the national life, they have become increasingly interested in their community organization. The construction of a new school building and a sheep dip is proof of this.

The cooperativa in Achica Bajo has 49 active members representing an equal number of households. The principal function of the coop is to manage the approximately 100 hectares of communal land. Annually the coop plants 1 to 3 hectares of potatoes and barley hay. The proceeds from the harvest generally go to projects that benefit the entire community. Cash obtained may be used to purchase construction materials or perhaps in wholesale purchases of items such as sugar and rice, which are resold in the community at no profit. In poor agricultural years, output from communal lands is distributed not only among coop members but among the entire community to help alleviate their economic distress. Table 16 discloses the inventory and value of coop assets. By far the most important of these is the animal dip which was built in 1966 at a cash cost of $b 1,800 (Bolivian Pesos), and local contribution of labor valued at $b 600. The entire cost was borne by the coop with only technical assistance from the office of Desarrollo de Communidades. The total assets of the cooperative were valued in 1967 at $b 3,590.

Table 16. Inventory and value of cooperative assets, Achica Bajo, 1967

Description	Units	Total Value
	number	$b
1 - Land	100 hecatres[a]	
2 - Adobe building	1	600
3 - Animal dip	1	2,400
4 - Wheel Barrow	1	240
5 - Pick	1	20
6 - Shovel	1	15
7 - Large scale	1	145
8 - Small scale	1	45
9 - Table	1	55
10 - Chairs	5	40
11 - Flag	1	30
Total value excluding land		3,590

[a]Estimated.

The school

To any visitor the striking feature in the community of Achica Bajo is the new school building. Its modern lines and colorful finish contrasts markedly with the surrounding buildings. The new school was inaugurated in February of 1967 and is run by the Junta de Auxilio Escolar, an organization whose membership is the entire community. The new school was built as a joint project of the community and the Division de

Desarrollo de Comunidades Rurales (DCR). The total cost of the building was $b 26,000 of which $12,000 was financed in cash by DCR and the remainder by the community. This share consisted of $b 6,890 in cash and the rest in land and labor.

In addition to the new building, the community owns the school assets listed in Table 17. The average number of children attending the new school is 45. Their parents pay annually $b 65 per student which constitutes the total salaries of the two teachers that administor the school. It should be noted that the limit of teachers forces many children to attend school in the town of Viacha.

Table 17. Inventory and value of school assets

Description	Units	Value
		$b
1 - Land	3 hectares	
2 - New building including 30 double benches		26,000
3 - Old abode buildings	3	10,200
4 - Well	1	400
5 - Water pump	1	500
6 - Flags	2	100
7 - School Flag	1	200
8 - Flag pole	1	50
Total value, excluding land		37,450

COMMUNITY AGRICULTURE

The Land

The purpose of the following sections is to discuss some factors associated with agriculture such as land tenure and land fragmentation. The importance of these factors can hardly be overemphasized. They are at the root of the deepest political conflicts in the less developed countries. In a basically agrarian society a change in land ownership implies a redistribution of wealth, status, and political power. "In short, a revolutionary change in the social structure" (15, p. 4). This is especially true in the case of Bolivia where after sweeping measures of land redistribution, land fragmentation is becoming a serious problem. A discussion of these factors for Achica Bajo should be fruitful to illustrate trends in post-reform organized communities in the country.

Land tenure

Land tenure, or the system by which the campesinos of Achica Bajo hold and operate their land holdings, is somewhat complicated because of the communal and individual form of ownership that prevails and by the fact that each household operates tracts in different numbers and sizes scattered all over the community.

In order to understand the tenure system it is necessary first to understand the Indian terms aynoca and sayaña. These two aymara words are more than just a verbal legacy of the ancient Inca civilization. They describe a sophisticated form of man-land relationship.

This, considering that despite their primitiveness, they were significant factors for the functioning of agriculture in an unfavorable natural environment such as the Altiplano.

Land ownership and cultivation during Inca times were on a communal basis. Individual land rights were unknown. All grazing lands were undivided and used to support collective herds. Cultivated land was distributed in three parts as follows: one part for the church (the sun), another for the Inca Ruler, and the third for the community. Lands assigned for community use were redistributed among family heads, each receiving periodically a basic allotment known as sayaña in the Aymara regions. In addition to this, families received smaller plots known as aynocas which were assigned in proportion to their number of children (8, p. 27).

These practices were disturbed by the arrival of the Spanish conquistadores. The Spaniards, through the system of land administration, adopted by the crown known as the Encomienda, gradually introduced a feudal system which gave rise to a small class of landlords (17, p. 57). The new class of landlords established a system of land exploitation by adopting some forms of Inca land allotment for the landless peasants.

Today in Achica Bajo the land tenure system reflects the same forms. There are three ways under which all of the land is held: communal lands, sayañas and aynocas. The sole difference is that since the organization of the community in 1929, the peasants own their land, and consequently families do not have to go through periodic redistributions as under the old Inca system.

Number and size of holdings

In the initial contacts with the people of Achica Bajo, prior to the survey, it was realized that to discover the amount of land owned by each household would be very difficult. Leaders of the community would say only that there were 129 private land holdings in the community, one for each of the 126 households included in the study and three belonging to absentee families. Referring to the size of these holdings, the leaders claimed that each farm possessed about 4 hectares[1]. The communal holdings were set at about 100 hectares. When asked then, why all the secrecy, they explained that it was a general fear that the information collected would be used for taxing purposes. In light of this, the best alternative was to gather the data on size of holdings only from campesinos that freely gave answers when requested. Out of 30 household heads, only 10 volunteered to have their land measured. It turned out that the four hectares quoted constitutes a good approximation of the average landholding in the community. Measurement of the ten farms gave an average of 4.35 hectares (Appendix Table 42). To present this information, however, as the leaders of the community did, stating that each household has approximately four hectares, is misleading. The disparity among the ten households surveyed was considerable. It varied from 1.60 to 8.70 hectares. The sample distribution seems to be a reasonable indication of the disparity that prevails in the community among individual farms (Table 18).

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[1]Refer to Measures Conversion Table.

Table 18. A sample of land holdings in Achica Bajo classified by size, 1967

Farm size in hectares	Farm units
0 -2	2
2.1-4	3
4.1-6	1
Over 6	4
TOTAL	10

The disparity observed in size of landholdings helped to confirm our suspicion that a political campaign by the government carried on simultaneously with the survey, explains best the secrecy of the campesinos as to the size of their holdings. The idea of a land redistribution would certainly have frightened the already skeptical campesinos, especially those who owned relatively more land. Another cause for their resistance may have been the actual measurement that was part of the survey. In order to gather reliable data in the Altiplano, this step becomes necessary since campesinos do not have a clear comprehension of land measures.

The land survey included the measurement of 43.5 hectares corresponding to ten farms. The 43.5 hectares were divided into 122 parcels of an average of 12 parcels per farm. The number of parcels per farm varied from 7 to 26. Of the 122 parcels surveyed, ten were held as sayañas and 112 as aynocas. The area occupied by the sayañas was 32.1

hectares or 74 percent of the land measured. The remaining 11.4 hectares were held under the aynoca tenure. The average size of the sayañas consequently was 3.21 hectares, ranging from 1.40 to 5.50 hectares. The 93 aynocas ranged in size from .02 to .20 hectares.

On the basis of the data collected, the following estimations can be made for the entire community. The total land privately owned was 561 hectares[1] parcelled in 6574 plots. Of these, 129 are sayañas accounting for 414 hectares or 74 percent of the total private land. The remaining 147 hectares are divided in 1445 aynocas or small parcels. Adding to these figures 100 hectares of communal land, the land of the entire community was calculated on basis of our land survey sample at 661 hectares (Figure 6).

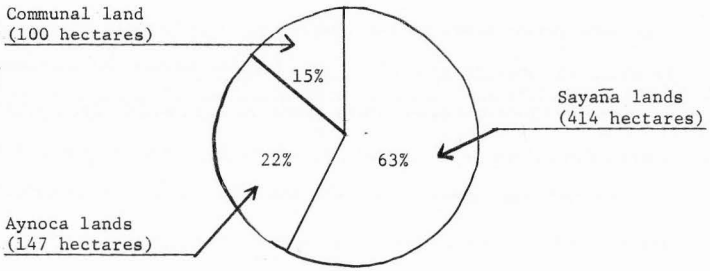

Figure 6. Number of hectares and percentage of land under tenure forms in Achica Bajo.

[1] 129 farms were used in making computations regarding land area estimations.

The figures given in this section seem to be representative of the land situation in Achica Bajo. They come close to the average quoted by the leaders of the community. Also, they support the complaints concerning the insufficiency of land which was heard on all sides in Achica Bajo. Approximately one hectare of unirrigated land per person is not a generous amount of land by any means.

Land transfer

Since the entire community was purchased in 1929, practically all of the campesinos of Achica Bajo have gained access to their land through inheritance. This is not to imply that transfers of land do not take place by purchases. From secondary data, it was estimated that approximately 15 percent of all households have participated at one time or another in land transactions. In almost all of these cases, however, the campesinos who purchased land were landowners already, or at least residents of the community. It seems that, unless through marriage, outsiders cannot obtain land in the community. Apparently each generation becomes more aware of the land scarcity problem; and for this reason, despite the fact that land is privately owned, the sale of land to newcomers is restricted.

Land titles

Not all the campesinos of Achica Bajo who own land had individual titles. Only about 57 percent did. The remaining 43 percent had collective titles. This means that a holding had been divided among various inheritors but there was still only one title for the entire land apportioned. Despite the considerable lack of individual ownership

records, no land feuds were reported within the community. The cost and effort of obtaining a title seemed to be an obstacle for many households. Also it is an indication of a tight community organizational control over the land.

Land value

Because land transactions are not frequent, it is difficult to establish a land value in Achica Bajo. Most of the campesinos interviewed could not assign a value to their land. Leaders of the community quoted a value of $b 700.00 or about US$ 58.00 per hectare for 1967. Through sale records, it was also established that in 1953 a few transactions were made for Bs. 45,000[1] or about US$ 36.00[2] per hectare.

The rental value of land in 1967 was $b 100 per hectare year. Ten years before, in 1957, this value was Bs. 10,000. All of these values were quoted without regard to quality of soil or location. In general, it seems that when land transfers for money occurred, factors such as kinship, friendship, or vicinity were more important than production in determining buyers and sellers.

Land fragmentation

The inheritance pattern of dividing the land among heirs has made land fragmentation a serious problem in Achica Bajo. Tracing back the

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[1]Time comparisons in Bolivian currency are difficult to make. Due to the serious inflation of the 50's, the currency unit was changed in 1963 at the rate of one $b per 1,000 Bs. In 1953 one US$ averaged 1,250 Bs.

[2]In dollars per acre, 1953 price was $14.60, while in 1967, $23.50.

parcelization process of a few cases, it is estimated that when the community was formed in 1929, the average size of private holdings was 12 hectares with less variation among households than today. This equalitarian distribution can be explained by the fact that payment for the purchase of the farm was on an installment basis, thus allowing even families with little cash to receive their share of land. In the 40 years that have passed since then, all the original holdings have been split up at least once. A rough estimate indicates that about 30 percent of the present farm are owned by grandchildren of the campesinos who bought the land in 1929. In these cases, the original holdings have been split up twice among two, three or more inheritors. One case was studied in detail. The father of the campesino interviewed had inherited, together with two other brothers, each a sayaña of approximately 4.3 hectares from a 1929 original holding. Although the father was still alive, he had already assigned two-thirds of the 4.3 hectares to two sons. The campesino interviewed was one of them and had received a tract of land 95 by 150 meters or 1.4 hectares, which constituted his sayaña.

Three factors help to alleviate somewhat the minifundia or fragmentation problem in Achica Bajo. One solution is for an heir to leave or sell his portion of land to another heir and obtain employment elsewhere. Another, and the most common, is to retain the land, farm it, and become a seasonal worker in the city of La Paz or elsewhere. Still another solution is to obtain additional land, generally from the elder through rental or sharecropping inside the community or in the vicinity.

Despite these solutions, the fragmentation of land into small and scattered parcels constitutes a serious obstacle for the agricultural development of Achica Bajo.

Land use

It was not intended in the survey to make a complete evaluation of the agricultural practices in the community. In order to understand, however, the situation of Achica Bajo, it is necessary to know how the campesinos use and work their land and the techniques and implements that they have available.

In a previous section 4.35 hectares were established as the average size of private holdings for a total of 561 private hectares of land in the entire community. In order to classify this land according to its utilization the agricultural survey included a classification of the area reported. The four classes and the criteria for establishing them were:

1. Pasture land includes the area used for grazing purposes.

2. Crop land represents the land available for planting during the 1966-67 season.

3. Farmstead land indicates the area occupied by dwellings, animal yards and storage facilities.

4. Non-productive land is the area used neither for grazing nor crops that lay idle.

The survey disclosed that of the 43.5 hectares measured; 14.3 ha. were used as pasture land; 21.5 ha. were in crops; 1.5 ha. were in farmsteads; and 6.2 ha. were non-productive lands (Appendix Table 42).

The respective averages per farm were 1.43, 2.15, .15, and .62 respectively totalling 4.35 hectares which is the average size of private holdings in Achica Bajo. Each of the 10 farms interviewed had at least one hectare of land for grazing with eight holding from 1 to 1.5 hectares. The remaining two farms used for grazing land in excess of two hectares each. Due to the difference in the size of individual holdings, the farm variance as percent of land dedicated to pasture, however, was considerable. It varied from a farm whose one hectare of grazing land represented only 15 percent of its total land to another whose 1.2 ha. of pasture accounted for 75 percent of its entire area.

The range in land available for crops per farm was from .30 ha. to 5.00 ha. This variation as percentage of farmland devoted to crops ranged from 19 percent to 67 percent.

The land under farmstead showed little variation among households. The range was from .05 ha. to .25 ha.

Non-productive land was reported by seven of the ten households surveyed. In four of them, the non-productive area was in excess of one hectare. The land was non-productive either because it had not been cleared of rocks, it was too alkaline, or because the land was in temporary fallow. The latter represented, however, only ten percent of the area reported in this category.

The findings presented above refer to land use during the 1966-67 season. They constitute, consequently, only rough estimates of the permanent use of land in Achica Bajo. This is especially true of the cropland which is affected yearly by the rotation system.

To summarize the use of private land in Achica Bajo the following estimations are made:

	Hectares	Percent
Pasture land	180	32
Cropland	271	48
Farmstead	19	4
Non-productive land	91	16
Total private land	561	100

Non-productive land included the entire holdings of 3 absentee landowners.

Agricultural Production Techniques

Irrigation

The problems of land fragmentation and low soil fertility in Achica Bajo are compounded by the scarcity of irrigation water. With the exception of a few years around small springs that benefit a small area of the community, harvests depend entirely on rainfall. In consequence agriculture becomes a not very reliable activity given the climatic conditions of the region. The springs mentioned and the numerous wells observed for home consumption, however, indicates the presence of a water table not far from the surface. The campesinos of Achica Bajo are aware of the irrigation problem. At the time of the visit of an irrigation specialist, they showed eagerness to supply the labor necessary for experimental drillings. Since projects like this one could be done without capital expenditures, simple technical direction could result in considerable benefit for a community like Achica Bajo. The risk of labor losses in case of misjudgment is minimized by the low opportunity cost of the labor.

Methods of production

The agricultural calendar in Achica Bajo is dictated by the timing of the rains. The irregularity of the rains, a frequent phenomena in the entire Altiplano, presents a serious problem to farmers. In Achica Bajo the preparation for planting begins in August. Generally, during this month campesinos clean their plots selected for planting. This consists mainly of the removal of rocks and stubble from the land surface. The second step in preparing the land is the breaking of the ground, which consists of plowing it two or three times. The standard implement for this is a wooden plow with a metal point. The power ordinarily consists of oxen which are known as yunta. This step is applied only in the fields for potato crops. For barley and quinoa no plowing is done prior to the seeding. These crops are planted in fields that were tilled the previous year for potato crops.

The rotation generally has the following cycle: after two or three years of rest the soil is planted one year to potatoes, followed by quinoa and then barley. A complete cycle generally lasts 6 years.

The decision as to the time of planting seems to depend on rainfall expectations. As a rule planting for potatoes takes place in October or November. The ideal for campesinos is to have the seed in the ground shortly before the rains begin.

Planting is usually done by a team of two persons, a yuntero to drive the oxen and a sembrador or planter to place the seed. Generally husband and wife form the team.

Considerable variation exists in quantity of seed used. The difference is explained by quality of soil and individual preferences. After the planting is completed some cultivation with a hoe is done. When plants begin to appear, campesinos watch their crops more carefully. It is not uncommon, for instance, when the day has been clear and a night frost is expected, to burn shrub tola. The smoke reduces the cold intensity. If practices like this have any major effect it is in the eyes of an outsider who see how little the outcome depends on the effort of these farmers. Visiting another Altiplano community this writer saw one hour of hard rain and hail destroy practically its entire crop, a striking experience when one realizes that this hour would result in hunger during an entire year for almost 200 persons.

When the crop proves successful, harvesting takes place at irregular intervals between March and May. The remaining months until the next season offer little to do agriculturally in Achica Bajo. A considerable number of the male population goes in search of temporary work in the Yungas, in La Paz, or in Viacha.

Improvements on the farm

Table 44, as shown in the Appendix, offers a sample inventory of improvements on the farms. Significant improvements are non-existent. The only items that could be taken into account in the survey were yards and wells. The yards are simple walls made of adobes or tapial. This type of construction consists of placing a large frame directly on the desired place, tamping mud into the frame, and allowing it to dry. There is no cost involved except the labor that goes into it.

Of the 22 farms surveyed, three had no yards at all; 15 had a single yard; and the remaining four farms had 2 yards each. The size of the yards ranged from 4 x 3 meters to 10 x 10 meters. The average was 1.05 yards per farm which gives an estimate of 132 private yards in the community.

Wells were observed less frequently. They consisted of hand dug holes which range in depth from 2 to 10 meters, mainly unlined. They are only for home use. Again, the cost is reduced to the value of the labor employed. The average per farm was .82 for an estimated 103 wells in the community. Dry wells were not included in the inventory.

It is interesting to note that when asked about the value of their farm improvements, the campesinos quickly stated the number of days worked times five pesos ($b). This valuation practice seems to be common in the community. It was probably adopted at the time when the Office of Community Development recognized the local contribution of labor at a rate of five pesos per day in the construction of the school building.

Farm equipment and tools

Despite the increasing displacement of labor in recent years toward more attractive economic activities, the chief characteristic of agriculture in Achica Bajo is still the abundance of human labor. This fact alone explains why farm equipment is not indispensable. It is expected, however, that as opportunities for non-agricultural work expand, the purchase of simple farm equipment will also increase. In this respect the "demonstration effect" is strong. For instance, the leaders of Achica Bajo, aware that other communities own tractors, have applied already for agricultural credit to buy one.

The inventory of farm tools and equipment conducted among 22 households seem to support this trend. The results are significant if it is remembered that until a decade or so ago the primitiveness in such places as Achica Bajo was such that the present ownership level of simple tools constitutes real innovations.

Table 45, as shown in the Appendix, gives a complete detail of the equipment and tool inventory for the sample of farms. The most important piece of equipment is the plow. Of 22 respondents, all but one possessed at least one plow with nine of them owning two plows. One of the latter group had become a pioneer with the purchase of an iron plow. The results of the inventory made a classification of tool ownership in Achica Bajo a simple task. There were tools that had become common, others fairly common, and some which were owned by a few individuals only. In the first group were: pickaxes, shovels, and sickles which were present in almost every household. Hoes, tongs, hammers, and hand saws constituted the fairly common tools. In the last group were wheel barrows and cane knives.

Table 19 summarizes the estimated inventory of farm equipment and tools for the entire community.

Table 19. Inventory of farm equipment and tools, Achica Bajo, 1967

Description	Community	Average per farm
Wooden plows	164	1.3
Pickaxes	126	1.0
Shovels	126	1.0
Sickles	416	3.3
Hoes	50	.4
Tongs	76	.6
Hammers	38	.3
Hand saws	50	.4
Wheel Barrows	13	.1
Cane Knives	14	.1
Iron Plows	6	

Crop Production

Only three crops accounted for the entire agricultural activity of the community. This lack of variety is typical of the Altiplano and also of places such as Achica Bajo where minifundia is a characteristic. Potatoes, barley hay, and quinoa were grown practically on every farm in Achica Bajo.

In a previous section a total of 271 hectares, or an average of 2.15 hectares per farm were stated as the land available for crop farming during the 1966-67 season. Of this total only 167 hectares were actually planted (Appendix Table 42). This area represented 62 percent of the total land available for planting with a farm average of 1.33 hectares. The distribution of total land planted (Appendix Table 43) shows that in the area barley ranked first, taking 117 hectares or 70 percent of the total; second was potatoes with 28 hectares or 17 percent; last was quinoa with 13 percent of the land seeded or 22 hectares.

Inputs

Potatoes. Potatoes are a staple in Achica Bajo. Among 30 farms interviewed, not one failed to report this crop. The agricultural survey disclosed, however, that the area devoted to potatoes was generally small. The measurement of the parcels of ten farms gave a total of 2.2 hectares of potatoes, or an average of .22 hectares per farm, ranging from .05 to .60 hectares (Appendix Table 43). The vartiation in land planted seems to reflect individual attitudes

toward commercial farming of potatoes. Some campesinos see it as a business enterprise and attempt consequently to plant more. However, most farmers apparently do not see much commercial value in potatoes and plant only for home consumption.

The 2.2 hectares of potato crops actually measured were found in 24 parcels. They ranged in size from plots of 6 by 25 meters to larger plots of 50 x 70 meters. The use of many and scattered plots seems to follow the sound business practice of spreading the risk. Campesinos believe that the more scattered their crops are, the less the chances of a complete loss in case of frost or hail.

Inputs that go into the potato crop were reduced for all practical purposes to the cost and labor for stirring the land 3 or 4 times, the seed and the manure used. There was no control of insects nor use of chemical fertilizers in Achica Bajo. The only input which was quantified in the survey was seed. It amounted to 2,950 pounds planted in the 2.2 hectares (Appendix Table 43). The corresponding averages were 295 pounds used per farm and 1,341 pounds per hectare planted. The disproportion between quantity of seed and area planted between farms was because of differences in the type of soil, the quantity of seed available, and individual preferences.

The aggregate quantities of inputs for potatoes in the entire community were estimated at 28 hectares planted with 37, 170 pounds of seed.

Barley. Barley for forage is an important crop in Achica Bajo. It is used principally as winter feed for the livestock, but it can constitute also a cash crop. Again, all the farms interviewed grew

the crop. The area dedicated to barley per farm varied from .20 to 1.80 hectares with an average of .93 hectares (Appendix Table 43). The 9.3 hectares of barley surveyed were scattered in 20 parcels ranging in size from plots of 10 by 15 meters to a plot of almost one hectare. The costs for producing barley seemed to be much less per hectare than for potatoes. This was because in the rotation cycle potatoes were planted first and consequently more plowing was required to prepare the soil than for barley and quinoa. Another reason was that for barley the land was not fertilized, not even with manure.

For barley the only input measurable with the exception of land was seed. The 10 farms surveyed utilized 1,740 pounds of seed. The average seed input was calculated at 174 pounds per farm and 187 pounds per hectare. Again, the data showed little correlation between land and seed input among farms. For the estimated 117 hectares planted with barley in the community the total input of seed was calculated at 21,924 pounds.

Quinoa. Quinoa ranks last in area planted among the three crops produced in Achica Bajo. The expansion of barley acreage appears to have affected considerably the area devoted to the production of quinoa. It is still, however, an important crop in the community, especially from the home consumption point of view. Two factors help make quinoa an attractive crop. One is its superior nutritional content. The other, and most important, is that the quinoa plant withstands frost and is quite drought-resistant after it becomes established (5, p. 16).

The area planted to quinoa by farms surveyed was 1.75 hectares or an average of about .18 hectares per farm (Appendix Table 43). The

Range was from .05 to .60 hectares excluding one farm that reported no quinoa. The 13 hectares of quinoa planted in the community absorbed an estimated 756 pounds of seed.

Outputs

Information for this section was obtained from a survey of two community samples. One consisted of data from the Agricultural Survey, The other from the income survey.[1] Both surveys included the same questions to determine community output for crops. Their procedures, however, were different. The agricultural survey included the measurement of plots for which the output was reported. The procedure for the income census consisted of just asking the farm operator his output. Considering the limitations of surveys in general, the two estimates are fairly close which adds support to their reliability.

Table 43, as shown in the Appendix, presents in detail the output data generated by the agricultural census while Table 21 discloses similar information from the income census. Table 20 is a summary of Appendix Table 43. In the next sections they are discussed in some detail.

[1]Using the averages of each of the two samples, two estimates were made for total community output in this section.

Table 20. Estimated acreage, production, and yields of crops in Achica Bajo, [a]1966-67 season.

Product	Farm Average			Total Community		
	Hectares	Production	Units	Hectares	Production	Yield/hect.
Potatoes	.22	690	pounds	28	86,940	3,105.0
Barley	.93	21.8	quintales[b]	117	2,747	23.5
Quinoa	.18	122	pounds	22	15,372	698.7

[a]Source: Agricultural survey

[b]One quintal equals 100 pounds

Table 21. Estimated[a] agricultural production in Achica Bajo, 1966-1967 season

Product	Farm average	Units	Total Community
Potatoes	565.0	pounds	71,190
Barley	32.6	quintales[b]	4,107
Quinoa	108.3	pounds	13,646

[a]Source: Income survey

[b]One quintal equal to 100 pounds

Potatoes

The total potato output reported by the ten farms under the agricultural survey amounted to 6,900 pounds, or an average of 690 pounds of output per farm (Appendix Table 43). The range in production among these farms was from 50 to 3000 pounds. Production figures included in this section are based on a poor crop year. The extreme adversity of the 1966-67 season in the entire Altiplano was such that the centers of

consumption that generally depend on this area for potatoes had to obtain them somewhere else. This fact is supported by the yields shown in Table 20. Inter-farm comparisons for the above reasons are not significant. It is noted that out of the ten farms, two harvested a smaller quantity than the seed used (Appendix Table 43).

The average computed from the income survey gives an output of 565 pounds of potatoes per farm (Table 21) for a community total output of 71,190 pounds, which is 18 percent lower than the 86,940 pounds estimated from the agricultural census.

Barley

The output of barley hay reported by the agricultural survey is 218 quintales[1] dry weight which corresponds approximately to 75 percent of the green weight (Appendix Table 43). The average per farm obtained from the agricultural survey gives 21.8 quintales (Table 20). The average computed from the income survey indicates 32.6 quintales per farmer (Table 21). The difference is 10.8 quintales. The aggregate estimates for the community are 4,107 quintales from the income census, and 2,747 quintales from the agricultural census or about 67 percent of the former.

[1]Refer to measures conversion table.

Quinoa

The production of quinoa according to the agricultural survey indicates an average output of 122 pounds per farm (Table 20). The corresponding figure computed from the income census shows 108.3 pounds (Table 21). The small difference between two samples that included together one-third of the population seems to be conclusive as to the reliability of the output data for quinoa. The total community output estimated from the agricultural census is 15,372 pounds; from the income census, 13,646 pounds. A difference amounting to less than ten percent of either community estimate.

Livestock

Livestock plays a major role in the economy of Achica Bajo. It provides food and clothing for campesinos, draft power for their farms, and a substantial share of their cash income. Most important is the major contribution that an improvement of this sector could make to the economic development of the community. Present cultural methods, however, are primitive.

In the following paragraphs sheep, cattle, hogs, and poultry industries are discussed. The emphasis will be at the community level. No discussion of the variability among individual farms will be made. The reader interested in this aspect may do so by examining the Appendix Tables as they become mentioned.

Sheep

Sheep is the most important type of livestock in Achica Bajo. All of the 22 farms included in the assets census had sheep. The average herd size in the sample was 13.09 head, or about 1,649 head for the entire community (Appendix Table 46). This count excludes sheep under one year of age. The exclusion is made following the campesino's custom of not counting yearlings as an asset, a practice which has its justification because of the high mortality rate that prevails in the Altiplano especially among lambs. Assuming a 35 percent survival rate, which is reasonable for the Altiplano, the total herd size including yearlings is estimated at 2,228 head in 1967.

The livestock census included questions to determine inventory changes over a 12-month period. First, the campesinos were asked what they considered a normal herd size. Their answers gave an average of 19.9 per farm for an approximate community herd of 2,507.

The aggregate changes in inventory between the months of September 1966 and 1967 are as follows: Beginning inventory, 1,729; ending inventory, 1,649 for a net decrease of 80 head. The decrease is explained by 401 head consumed, 263 deaths, and 92 sold and by the addition of 676 head. The addition consisted of lambs not included in the beginning inventory that matured during the year and consequently were included in the ending inventory.

An inventory analysis, taking the beginning inventory as the percentage base, indicated that this was below the normal level by 45 percent. Consumption was 23.2 percent, losses by death accounted

for 15.2 percent and sales consisted of only 5.3 percent of the beginning inventory. The ending inventory was 95.4 of the beginning and about 40 percent below the normal level. The inclusion of lambs, however, increased it to almost 129 percent of the beginning or just 16 percent below the normal level. This analysis is significant in explaining the general characteristics of sheep ranching in Achica Bajo. The campesinos, through trial and error, have developed a notion of the carrying capacity of their lands. In the absence of improved practices, their sheep ranching is reduced to maintaining a given herd size by consuming and selling the sheep that the survival rate permits.

Cattle

Cattle production is also an important activity in Achica Bajo. It provides draft animals, farm yard manure to improve soil fertility, milk and cheese, and profits from buying and selling.

Of the 22 farms surveyed, 20 reported an ending inventory (Appendix Table 47). The average number of cattle was 3.18 for an estimated 401 in the entire community. The beginning inventory gave a total of 367 head which is below the normal level by 11 head. The ending inventory shows a net increase of 34 head over the initial inventory. This increase is the outcome of 45 head sold, 18 deaths and an addition of 97 animals. The addition consisted of some calves, but mostly purchases of young cattle. Data gathered suggest that purchases of cattle and hogs are made, but generally not of other

animals. Commercial consideration seem to be the rationals for excluding sheep.

The inventory changes for the 12-month period as percentages of the beginning inventory figure can be summarized as follows: 12.3 percent sold; 4.9 percent lost by death; and 26.4 percent of births and purchases combined, for an ending inventory of 109.3 percent. The ending inventory consisted of 97 bulls and 304 cows, a ratio of 1 to 3 approximately. Cattle are not used for home consumption at all. The usual practice is to buy them young, keep them for 2 or 3 years, benefit from their power, and sell them at a profit.

Hogs

Hogs rank third in importance among livestock enterprise in Achica Bajo. Raising of these animals is done primarily for sale. The ending inventory shows an average of 1.45 per farm. (Appendix Table 48). Of the 22 farms surveyed, 12 possessed hogs. The aggregate normal community herd size was estimated at 189. The beginning inventory was 149 hogs or about 79 percent of the normal level. Additions consisted of 160 animals born or purchased. Decreases comprised 23 consumed, 45 sold and 57 deaths. The resulting net increase brought the ending inventory to 184 hogs or approximately 97 percent of the normal level. As percentage of the beginning inventory consumption was 15 percent; sales 30 percent; deaths, 38 percent; and born or purchased, 107 percent. Home consumption of hogs is rare. Killing a hog for home consumption constitutes a major capital expenditure. It if happens, it is generally associated with a family or community celebration.

Chickens

Chickens were raised on 18 of the 22 farms surveyed. The flock size per farm, as in the case of the other animals, was rather small. The average flock size computed from the ending inventory was 3.23 chicken per farm (Appendix Table 49). The aggregate normal flock size for the entire community is estimated at 423. Of the beginning inventory of 396 chickens, 86 were lost, 63 consumed, 74 sold and 234 were hatched for a net increase of 11, resulting in a total ending inventory of 407 chickens. This ending inventory figure was below the normal level by about three percent. In percentage terms about 19 percent of the initial inventory was sold, 16 percent consumed and 22 percent lost. The new hatch accounted for approximately 59 percent. Despite its small scale, the poultry enterprise has considerable effect in the economy of farms due to sale revenues and egg production.

Other animals observed around the farms of Achica Bajo were donkeys, rabbits, guinea pigs, ducks and dogs. No llama or alpaca were reported or observed. The assets for the 22 farms surveyed disclosed a total of 12 donkeys. The average of .55 per farm gives a total of 69 donkeys for the whole community. Only 8 of the 22 farm operators interviewed accounted for the donkeys. This is a clear indication that campesinos of Achica Bajo are moving away from some traditional farming practices of the Altiplano which made more use of donkeys for transportation. No attempt was made to quantify the other animals mentioned due to their limited numbers and lack of economic significance.

Livestock products

The livestock products of Achica Bajo can be divided in two groups. Some are income earning; others, despite their potential, do not produce income revenue directly. In the first group are eggs and cheese; in the latter group wool, skins, and manure can be included. Sales of beef or live animals are not reported in this section. These transactions were discusseed under livestock inventory changes.

The annual production of milk in Achica Bajo is estimated at 102,600 liters, or an average of 817 liters per farm. Most of this production plus the entire production of sheep milk is used in cheese manufacturing. A few campasinos reported using some of their milk production for home consumption.

Cheese is manufactured by primitive methods that require no significant investment in equipment. Out of the 20 farm operators interviewed in the income census, 16 or 80 percent, reported cheese production. The average cheese production is computed at 198 units per farm for an estimated aggregate community output of 24,948 units (Table 22).

Table 22. Estimated output of agricultural products in Achica Bajo, 1967

Product	Farm Average		Total Community
Cheese	198	units	24,948
Eggs	321	units	40,446
Wool	4.12	pounds	519

Cheese production plays an important role in the community economy. Two factors are helpful in this respect. First, the La Paz market which can absorb large quantities of cheese is close. Second, cheese production constitutes a by-product with its cost approaching zero, since the milk and labor have practically no opportunity cost.

Egg production is similar to cheese production. The livestock inventory indicated a total of 407 chickens in the community. The corresponding output of eggs is estimated at 40,446 per year, or an average of 321 eggs per farm (Table 22). The annual production per bird is estimated to be approximately 100 eggs. Again, feeding and inefficient management practices account for the low production level.

The situation for wool clearly demonstrates the detrimental effect that the absence of good production techniques have on the economy of Achica Bajo. Although the wool is of poor quality, there is a present potential clip in the community of 2,474 pounds per year. This is assuming a clip of 1.5 pounds per sheep. The campesinos of Achica Bajo are far from exploiting this productive level. In the survey of 20 farms, 17 reported wool clip during the year. The average for the farms surveyed was 4.12 pounds per year with a range from 2 pounds to 12 pounds per farm excluding the three farms that reported no shearing at all. Using the sample average the total wool shorn during the year was estimated at 519 pounds or only about 20 percent

of the potential clip for the community (Table 22). This fact can be attributed to the campesino's practice of shearing sheep only once or twice in the animal's lifetime and using knives or broken glass as shearing instruments. This goes without saying a word about the great effect that improvement practices could have in the quality and yield of wool.

Use of Produce

In the previous sections the output levels were established for Achica Bajo. In this section the distribution of the total produce is discussed.

Achica Bajo is far from the self-sufficient economy that characterizes most of the rural Altiplano. In fact, as it will be seen later, this community is highly dependent on external transactions to supply its basic needs.

Farm products are distributed in four ways; home consumption, sales, seed and forage. Contrary to our expectations, no significant bartering, with the possible exception of labor services, takes place within or outside the community.

Home consumption

Home consumption in 1967 asborbed 58 percent of the annual potato, 91 percent of quinoa, 30 percent of the cheese production, 15 percent of the eggs and 100 percent of the wool output. In annual averages per household, this represents 327 pounds of potatoes, 98.4 pounds of quinoa, 59.5 units of cheese, 48 eggs and about 5 pounds

of wool. The corresponding aggregate levels of home consumption for the entire community are 41,402 pounds of potatoes, 12,398 pounds of quinoa, 7,497 units of cheese, 6,048 eggs, and 504 pounds of wool. In the following chapter when a value is assigned to these physical quantities, the percentage of the total produce devoted to home consumption will be indicated.

Sales

The agricultural products that generated sales revenue during the 1966-67 season were eggs, cheese, and barley. Percentages of their total production sold were 85, 70, and 19 percent, respectively. Sales amounted, in averages per farm, to 273 eggs, 138.5 cheese units and 26.5 quintales of barley sold during the entire year. At the aggregate community level this represents sales of 34,398 eggs, 17,451 units of cheese and 3,339 quintales of barley. All of the quantities above represent the physical outflow of goods from the community since transactions involving these products are rare within the community.

Seed

Reserves for seed took up 42 percent of the potato output and 9 percent of the quinoa output. No seed for barley is produced in the community. The average quantity of potatoes and quinoa reserved for seed were 328 pounds and 9.9 pounds per farm respectively. At the community level reserves for seed amounted to 29,988 pounds of

potatoes and 1249 pounds of quinoa. The previous year seed input for the total community, calculated from the Agricultural Census, was 756 pounds, or 61 percent of the quinoa reserves just mentioned. For potatoes, the seed input reported in the agricultural survey was 37,170 pounds or 24 percent more than the above reserve.

Forage

Barley constituted the only forage crop. It was shown that 19 percent of the aggregate output was for sale. The remaining 3,390 quintales were used within the community. The average quantity of barley hay used per farm was 26.5 quintales per year.

COMMUNITY ECONOMY

The Model

The major objective of this study was to quantify the economic activity of Achica Bajo. To this end a suitable accounting approach is made in this part for the presentation of the statistics on community income and expenditure generated by our survey. The approach aims at making the accounting set speak by itself about the aggregate economic level of the community. Gross errors that might be overlooked if either an income or an expenditure approach were used alone are somewhat minimized.

The accounting framework consists of a two-account model. The main feature of the model is the assumption that:

Aggregate Community Income = Aggregate Community Expenditure.

Simple as it may be, the importance of this model should not be minimized. First, it quantifies the aggregate economic activity of the community. Second, it has the merit of indicating the make-up of the income and expenditures accounts. Third, the balance equation not only is that used by any person working on a system of national accounts, but it also resembles simple accounting systems of businesses and households. Thus, the community accounts can be looked upon as aggregations of the corresponding accounts of all households that form the community. Another advantage of the model is that, being based on the double-entry accounting principle, it is a two-way approach to measure

the economic activity of the community. One is from the income side; the other from the expenditure side.

The major disadvantage of the model is its failure to consider internal community transactions. In addition, the accounts are incomplete with respect to capital formation or savings. In the case of Achica Bajo, these limitations can be ignored because internal transactions are minimal and village net worth is little changed from year to year.

The data for the model is presented by sections as follows. In the first section a value is assigned to the physical farm output already discussed; next comes the distribution of the value assigned to the farm output among its uses. The next two sections, employment and commerce, determine the non-farm income of the community. The next section, by putting together farm and non-farm revenues, determines the aggregate community income. This value satisfies the left side of the equation above.

Having explained the income flow, the next step is the determination of the expenditure flow. First, the aggregate value of expenditures for the community is shown. Since the income and expenditures accounts do not balance, a section explains briefly why this may be so. After this follows a detailed breakdown of expenditures. This part on the economy of Achica Bajo concludes with a valuation of the assets of Achica Bajo.

Farm Production Value

In this section a value is assigned to the farm output reported in physical terms in the previous part of this study. The assessment of the entire output is based on the production figures of individual commodities multiplied by an average market price. The valuation is presented in two parts because each corresponds to a separate sample. One part, computed from the income census, gives the value of crops and livestock products. The other, on livestock, was obtained from the assets census.

One observation should be made regarding livestock output or production. It was deemed appropriate to denote in this study livestock production only to animals sold or killed for home consumption. The output figure, therefore, does not reflect net changes between beginning and ending livestock inventories. The justification is that over the long run, livestock inventory changes are not considerable. A decrease in one year is offset generally by an increase in another.

The aggregate community value of crops and livestock products during the 1966-67 season amounted to $b 159,748, or an average of $b 1,267.84 per farm (Table 23). Of this, $b 56,952, or 36 percent, came from potatoes. Barley was second with $b 44,076, or 26 percent. Next was cheese output with $b 37,422, or 23 percent. The remainder was divided among eggs, quinoa, and wool.

For livestock, the aggregate value of community production is calculated at $b 71,197 (Table 24), or about half the total reported for crops and livestock products. Cattle and sheep accounted for 88 percent of this total. The value corresponding to cattle was $b 40,500; for sheep it reached $b 22,185. The remaining 12 percent was divided between hogs and chicken production. The farm average for total livestock production was $b 565.06.

Table 23. Value of crops and livestock products, Achica Bajo, 1967

Product	Production	Unit	Average price	Value of Production	Farm Average	Percent
	$b		$b	$b	$b	
Potatoes	71,190	lbs.	.80	56.952	452.00	36
Barley	4,107	quintal	10.00	41,076	326.00	26
Quinoa	13,647	lbs.	.50	6,823	54.15	4
Eggs	40,446	units	.40	16,178	128.40	10
Cheese	24,948	units	1.50	37,422	297.00	23
Wool	519	lbs.	2.50	1,297	10.29	1
TOTAL				159,748	1,267.84	100

Table 24. Value of livestock production, Achica Bajo, 1967

Animal	Production	Unit	Average price	Value of Production	Farm average	Percent
			$b	$b	$b	
Cattle	45	head	900.0	40,500	321.43	57
Sheep	493	head	45.0	22,185	176.07	31
Hogs	68	head	100.0	6,800	53.97	10
Chicken	137	head	12.5	1,712	13.59	2
TOTAL				71,197	565.06	100

Combining the two groups, the total value of the farm production for Achica Bajo is estimated at $b 230,945 for the 1966-67 season. Crops accounted for $b 104,851, or 45 percent; livestock products for $b 71,197 or 31 percent; and livestock contributed to the residual 24 percent, or $b 54,897 (Figure 7).

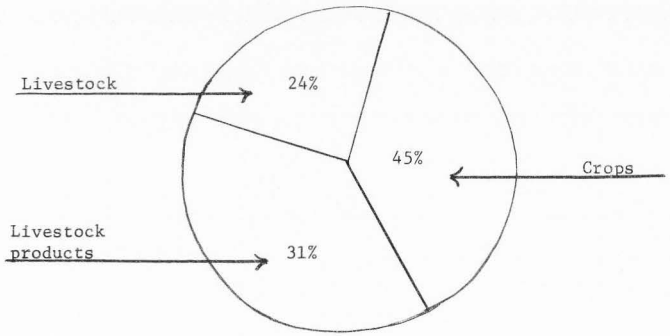

Figure 7. Farm production by enterprises in Achica Bajo, 1967

Value Distribution of Farm Production

In the previous section the total output value of crops and livestock products was set at $b 159,748. The distribution of this total was among four uses (Table 25). The value of home consumption consisted of $b54,172 or 34 percent. Sales amounted to $b 47,622 or 30 percent. Next was forage with a value of $b 33,390 or 21 percent. And finally seed was valued at $b 25,564 or 15 percent. The average produce distribution per farm was: home consumption, $b 430; sales, $b 378; forage $b 265; and seed, $b 195. The entire sample data used to calculate these figures appear in Appendix Table 50.

For the reasons given before livestock production was distributed in two parts (Table 26). Livestock for home consumption reached $b 21,132 or 30 percent. Livestock sales came up to $b 50,065 or 70 percent. The averages per farm were $b 168 and $b 397, respectively.

Table 25. Distribution of crops and livestock products, Achica Bajo, 1967

Product	Production	Home Consumption	Sales	Seed	Forage
	$b	$b	$b	$b	$b
Potatoes	56,952	33,012		23,940	
Barley	41,076		7,686		33,390
Quinoa	6,823	6,199		624	
Eggs	16,178	2,419	13,759		
Cheese	37,422	11,245	26,177		
Wool	1,297	1,297			
TOTAL	159,748	54,172	47,622	24,564	33,390
Farm Average	1,268	430	378	195	265
Percent	100	34	30	15	21

Table 26. Distribution of livestock production, Achica Bajo, 1967

Animal	Production	Home Consumption	Sales
	$b	$b	$b
Cattle	40,500		40,500
Sheep	22,185	18,045	4,140
Hogs	6,800	2,300	4,500
Chickens	1,712	787	925
TOTAL	71,197	21,132	50,065
Farm average	565	168	397
Percent	100	30	70

Putting together crops, livestock and livestock products, the value distribution of the total farm output was: home consumption, $b 75,304, or 33 percent; sales, $b 97, 687, or 42 percent; forage $b 33,390, or 14 percent; and seed, $b 24,564, or 11 percent (Figure 8).

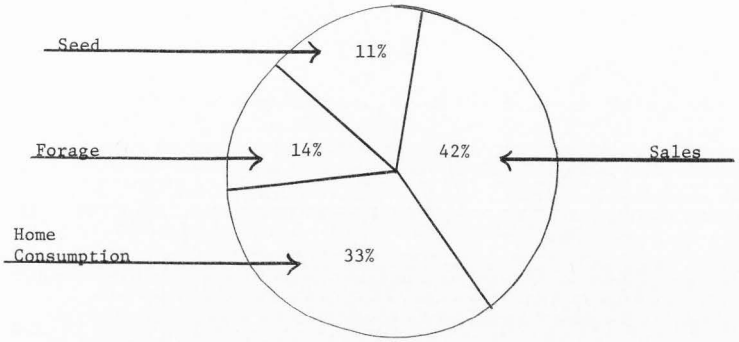

Figure 8. Distribution of farm production in Achica Bajo, 1967

Non-Farm Income

The community as a whole derives income from crops, from livestock transactions, from animal products, from commerce and from employment. These activities figures correspond to farm income and were already presented. In order to estimate in rough terms Achica Bajo's aggregate income, the values corresponding to commerce and salaries will now be calculated.

Employment

In the section on occupations, it was reported that a considerable number of achicabaqueños held full-time jobs outside the community. In addition, it is known that some have seasonal employment outside the community.

According to the income survey, 16 of the 20 households interviewed reported employment earnings (Appendix Table 51). The total amount reported in the sample amounted to $b 32,694 for the entire year, which gives an annual average per household of $b 1,635. On this basis, the aggregate employment earnings for the community were calculated to be $b 206, 010 for a year (Table 27).

Table 27. Summary of permanent and temporary employment earnings, Achica Bajo, 1967

Persons employed employed	Persons employed	Annual earnings	Average/ person
		$b	$b
Total community	139	206,010	1,482
Household average	1.1	1,635	

The number of people in the sample permanently employed or not reached 22, or an average of 1.1 per household. The range was from four households with no members employed to a family with three wage earners. The length of employment during the year varied considerably (Table 28). Of the 22 persons employed in the sample of 20 households, nine held jobs for less than a month, four between 2 and 8 months, the remaining nine had year-around jobs.

Table 28. Length of employment in a sample of 20 households, Achica Bajo, 1967

Members employed		One month or less	2-8 months	Entire year
Total	22	9	4	9
Percent	100	41	18	41

Three places of employment were reported. Services of ten campesinos were used around the community. Ten had their jobs in La Paz, the other two worked in the Yungas region.

All those employed reported wages by the day. The daily rates quoted varied considerably according to the three regions. The mean average rate for the workers in Yungas was $b 13.00, in La Paz $b 9.43, and in Achica Bajo and vicinity $b 5.11.

The highest rate reported was $b 18.00 per day for a trucker helper job. The lowest was $b 3.00 for agricultural work within the community. In general, non-agricultural work paid higher rates. Of the 22 employed 12 reported non-agricultural occupation. As a rule the value of 8 hours of agricultural labor in Achica Bajo is five pesos. Labor demand around the community is limited to times of planting and harvesting. Demand in other regions such as La Paz appears more stable. The decisive factor for obtaining a job seems to be the willingness of the campesino to go and work elsewhere. On these grounds it can be said that labor in Achica Bajo has an opportunity cost. The statement should be restricted, however, to the male population in the economically active age group.

Commerce

The term comerciante is used in Achica Bajo in a very broad sense. It includes the activities of campesinos who devote most of their time to livestock trading, to secondary activities such as weaving for sale, and selling of groceries. The questions were aimed at obtaining directly net profits from all commercial activities. Due to their diversity this information was not easy to get. Commercial profits are well kept secrets everywhere.

Of the 20 households surveyed 13 households stated receiving no profits at all from commercial activities (Table 29). Five families or 25 percent disclosed net annual profits from $b 350 to $b 800. The remaining two families calculated their net commercial gains at $b 1,400 and $b 4,800. Accepting this distribution as representative, the aggregate net commercial gains are estimated at $b 56,070 for the whole community.

Table 29. Annual commercial profits, Achica Bajo, 1967

Profits	Households		Household average
	Number	Percent	
$b			$b
None	13	65	0
1 - 1000	5	25	540
1001-2000	1	5	1,400
2001-5000	1	5	4,800
Total sample	20	100	445
Total community	126		56,070

Aggregate Community Income

Total income from agricultural and non-agricultural sources for Achica Bajo can now be roughly calculated. For a better understanding it is necessary to know what is included as income in this study. Income includes monetary receipts from the sale of farm products, net gains from commerce, and salary receipts, plus the market value of farm production used for home consumption. The latter is denoted income in kind.

The aggregate income account was prepared from the different summaries concerning the contributions of the different sectors. All the income data with the exception of that generated by livestock transactions was obtained through the Income survey. The income figures are net in the sense that they do not include costs that are simple to qualify such as the value of agricultural production devoted to forage or seed, or costs requiring direct cash outlays. No deduction has been made, however, for costs hard to assess such as labor, capital use, and marketing expenses.

The aggregate community income amounted to $b 435,071 (US $36,256) during the crop year 1966-67 (Table 30). The average share for the 126 community households comes to $b 3,453 (US $288). When this total income is divided between cash and kind a remarkable 83 percent, or $b 359,767, emerges as representing cash revenue. The remaining $b 75,304 or 17 percent is the income in kind or market value of farm produce for home consumption.

Employment earnings made the most significant contribution to the aggregate community income.[1] It amounted to $b 206,010 or 47 percent.

Table 30. Aggregate community income, Achica Bajo, 1967

Source	Income					
	Total		Cash		Kind	
	$b	%	$b	%	$b	%
Crops	46,897	11	7,686	2	39,211	52
Livestock	71,197	16	39,936	11	14,961	20
Animal products	54,897	13	50,065	14	21,132	28
Employment	206,010	47	206,010	57		
Commerce	56,070	13	56,070	16		
Aggregate community income	435,071	100	359,767	100	75,304	100
Household average	3,453	100	2,855	83	598	17

Second were livestock sales representing 16 percent with its $b 71,197. Commerce and sale of animal products run approximately equal with 13 percent each. Crops made the least contribution, $b 46,897 or 11 percent.

A similar distribution of only cash income shows again employment earnings first with an increased 57 percent, commerce with 16 percent, animal products with 14 percent, livestock with 11 percent, and last,

[1]Includes income in cash and kind.

with an insignificant two percent, were crops. In income in kind, however, crops rank first with 52 percent. Animal products with 28 percent and livestock with 20 percent constituted the remainder.

On basis of these income estimates one can state that Achicabaquenos are engaged in relatively considerable economic activity. This helps to confirm claims of increased peasant market participation in rural areas of Bolivia since the agrarian reform (2, pp. 12-27). The most significant factor in this direction for Achica Bajo is its high market participation represented by 83 percent of its aggregate income in cash during 1967. Needless to say, this remarkable showing, both in income levels and market participation relative to what is expected of most Altiplano communities, can be explained to a large extent by the proximity of the city of La Paz.

The observation of the aggregate income account and its distribution by activities would inevitably induce the reader to conclude that Achica Bajo is not an agricultural community. Viewed in terms of the economic contributions of its various activities, this may be a valid position for the season 1966-67. Considering, however, its labor force division, the poor harvests in this particular year, and especially the limited technology available to exploit its present agricultural resources, one may conclude that Achica Bajo is still an agricultural community. The fact that it is not fully developed causes employment earnings from a small percentage of the population to have a major effect in the community economy.

Aggregate Community Expenditures

Annual expenditures

The mean average of total expenditures per household was $b 4,608.27 (US $384) per year (Table 31). From this average the total annual expenditure account for Achica Bajo is estimated at $b 580,642 (US $48,387). This total is constituted of three consumption categories. Current consumption expenditures absorbed approximately 87 percent, non-current items about 3 percent, and business expenses the remaining 10 percent.

Savings

The amount of savings disclosed by the survey gives a household average of $b 24.00 per year for an aggregate community total of $b 3,024 (Table 31). Due to this relatively low savings level the reported total will be treated as part of the aggregate expenditure account to fit our model.

Table 31. Summary of annual expenditures and savings, Achica Bajo, 1967

Consumption categories	Total sample	Household average	Total community	Percent
	$b	$b	$b	
Current consumption expenditures				
Food and beverages	43,871	2,193.55	276,388	47.4
Clothing	26,051	1,302.55	164,121	28.1
Medical	853	42.65	5,374	.9
Transportation	21,060	108.00	13,608	2.3
Educational	3,148	157.40	19,832	3.4
Services	512	25.60	3,226	.6
Entertainment	3,500	175.00	22,050	3.8
Contributions	331	16.55	2,085	.4
Miscellaneous	500	20.00	2,520	.4
Non-current expenditures				
Durable goods[a]		93.61	11,795	2.0
Business expenses				
Taxes	221	11.05	1,392	.2
Seed and forage[b]		105.95	13,350	2.3
Marketing (fairs)[b]	4,000	200.00	25,200	4.3
Farm equipment[c]		156.36	19,701	3.4
Total Cash Expenditures		4,608.27	580,642	99.5
Savings	480	24.00	3,024	.5
Cash Income		4,632.27	583,666	100.0

[a]10 percent of households goods inventory.

[b] Estimated indirectly.

[c]10 percent of farm equipment sample inventory.

Aggregate community expenditures

Including savings to the reported annual expenditures, the community total cash outflow is estimated at $b 583,666 per year. This figure constitutes the right side of our equation model or the aggregate community expenditure account. The corresponding annual average per household is calculated at $b 4,632.27.

Aggregate Community Income And Expenditure Difference

In Table 30 the aggregate cash income for the community was estimated at $b 359,767. In Table 31 the expenditure outflow was estimated at $583,665. With these figures our identity model does not balance. Various factors may explain this divergence between the income and expenditures outflows. Some of these are listed below.

1. Variances are intrinsic in statistical population projections from two or more different samples, especially if the samples are relatively small.

2. The expenditure account may exceed the income account simply because the expenditures listed correspond to cash generated in the previous year while the income account reflects revenues of the survey year. The fact that this year was poor agriculturally supports this explanation.

3. Dis-saving may explain by itself the difference between income and expenditures, especially in years of poor crops.

4. Finally, expenditures may be overstated, especially for items such as clothing on which annual totals were obtained directly from households. Since sense of time is not very clear among campesinos, this may have caused them to include purchases made before the twelve-month period that preceded the survey.

Expenditures Breakdown

Campesinos may receive their income from many different sources, but regardless of origin, most of their money goes to meet the basic needs of food and clothing. Thus, the expenditure pattern of the sample is more likely to be representative for the community than the way income is received. The expenditure data of 20 households included in the expenditure sample show the spending patterns that prevail in Achica Bajo. The figures provide detailed information about consumption of individual commodities, and consequently, an indication of the prevailing level of living in the community.

Current consumption

Food is the most important item in the household budgets. It accounts for about 47 percent of the cash outflow. The 20 households reported $b 3,656 for food during a month which gives a total annual sample of $b 43,871. The average per household was $b 2,193.55 per year or $b 183 per month. The annual community food bill was $b 276,388 (Table 31). Individual families spent all the way from $b 94 to $b 280 per month. As the mean household size in the sample was 5.25, the average per capita expenditure for food was $34.86 (US $2.90) per month.

The proportion of money income spent for food by the households ranged from a high of 71 percent to a low of 32 percent. The sample indicates households spent about half their earnings in food. According to Engel's law it should be expected that as income increases a smaller percentage should be spent for food. This was not true in our sample. The one household spending 71 percent of its budget for food had a cash income of $b 250 per month, while the one with 32 percent had $b 330 per month as income. Other factors such as make up of families and individual preferences seem to be important determinants. This can be observed by grouping the 20 household budgets according to the size of the household (Table 32). This indicates a clear relationship between food expenditures and household size. The table shows that an increase from one household size class to the next class produces an increase between 20 and 30 percent in the average food expenditure.

Table 32. Sample annual household expenditures by size of household, Achica Bajo, 1967

Household size	No. of house-holds	Total		Food and beverages		Clothing		Others	
		House-hold	per capita	H.H.	P.C.	H.H.	P.C.	H.H.	P.C.
1 - 3	5	3,175	1,323	1,704	710	854	356	617	257
4 - 6	10	4,453	809	2,208	401	1,503	273	742	135
7 - 9	5	5,026	662	2,658	350	1,349	178	1,019	134
All sample	20	4,277	815	2,194	418	1,303	248	780	149

The next important item in the familiar expenditure budgets is clothing. The annual data obtained from the 20 households gives an average expenditure on clothing of $b 1,302.55 (US $109) per household (Table 31). The aggregate community total of $b 164,121 represents 28 percent of the annual cash expenditures. The range in clothing expenditures per household was much wider than for food. In one extreme was a household with $b 292 of clothing expenditures per year, while on the other there were two with more than $b 2,000. The sample gives an average per capita annual expenditure of $b 248 (US $21) in clothing.

The proportion of money income disbursed for clothing varied among households from a minimum of 10 percent to a maximum of 47 percent. In general most families seem to spend between 20 and 30 percent of their income in clothing. Again the expected relationship between clothing expenditures and household size is easily observable in our sample (Table 32).

Other items in the current consumption class were transportation with 2.3 percent of money income, education with 3.4 percent, and entertainment with 3.8 percent. The remaining items, each representing less than one percent of cash income, were medical services, contributions, and miscellaneous.

Non-current expenditures

Durable goods constitute the only item under the non-current catagory. Since it is difficult to gather reliable household data on purchases of household goods, it was convenient to use 10 percent

of the household goods inventory (Appendix Table 41) as a rough estimate of the annual purchases. The average obtained per household was $b 93.61. On this basis the total community expenditures on durable goods is estimated at $b 11,795 per year or about two percent of all cash expenditures.

Business expenditures

Under the business category expenses related to farm operation were included. Marketing was the largest item in this group amounting to 4.3 percent of cash expenditures. Next were farm equipment with 3.4 percent, seed and forage with 2.3, and last, taking up only 0.2 percent, were taxes. The marketing bill consisted of expenses incurred while attending fairs. It included transportation costs of produce and meals and lodging when applicable. The average annual expenditure was about $b 200 per household. The expenditure figure on farm equipment constitutes a rough estimate of annual purchases. It was calculated as 10 percent of the inventory value of farm equipment (Appendix Table 45).

The forage and seed expenditure was obtained from the agricultural census. It consisted exclusively of barley purchases, grain for seed, and a few cases of hay for supplementary forage. The average expenditure was $b 105.95 per farm.

Annual tax payments per household averaged $b 11.05 for a total community bill of only $b 1,392. This is explained by the absence of land or income tax in rural areas of the country. Tax payments reflected in the survey correspond to small payments for trading licenses (sentaje) collected in the town of Viache.

Expenditure Details

Food details

A general idea of household diets and, therefore, their level of living is given by the amounts spent for the different food items. To secure these figures it was necessary to record for each of the 20 families surveyed in the expenditure survey the monthly totals of a considerable number of items. The list of all the different kinds of articles purchased are in Appendix Table 53. It includes the average quantity, prices, and average value per household in the sample for each of the individual items. The corresponding aggregate quantities and values for the entire community are also shown.

Bread is the principal food purchased by the campesinos of Achica Bajo. It was used by every family, and in value terms is the highest (10.1 percent). The average monthly expenditure per household was $b 18.45, ranging from $10.0 to $b 32.0.

Rice, corn, and wheat were the grains reported in the survey. Rice was the most generally used. It was bought by all of the 20 households in the sample; corn, by 19; and wheat by 12. The household expenditure for rice varied from $b 40 to $b 5 per month. For corn and wheat the range among the families reporting their use was from $b 2.0 to $b 12.0. In value terms the rank in grains was rice (8.7%), corn (4.2%) and wheat (1.6%).

Two kinds of flour are used in the community. Wheat flour (harina blanca) was purchased by eleven households and corn flour (harina amarilla)

by ten. From the sample data one clearly sees that they are substitute goods. From the 17 households reporting any use of flour, only four indicated purchases of both kinds. Of the 13 remaining, seven consumed wheat flour and six corn flour. In quantity, their use appears to be close. The household average for wheat flour is 3.3 pounds per month while for corn flour is 2.9 pounds. Due to their price difference, however, the expenditures on wheat flour are almost double that of corn.

Sugar and noodles are other important articles in the campesino's diet. They were used by all the families interviewed. The average consumption of sugar was 15.05 pounds per month ranging among households from 8 to 25 pounds. The range in noodle consumption appears much wider. It varied from 2 pounds to 30 pounds to give a household average of 11.8 pounds per month.

The reported purchases of potatoes and the dry derivative chaño can be considered emergency food acquisitions caused by the poor year harvest. It is known that these two products together with quinoa constitute the basic diet of campesinos in the Altiplano. In bad years when their production is below their minimal consumption levels, they are forced to make purchases from the outside to complement whatever their production is. The average monthly purchases of 20.12 pounds of potatoes and 9.75 pounds of chano per household should be construed as such. Not all the families, apparently, were affected equally in their potato crops. Only ten families reported purchases of these products in quantities varying from ten to 50 pounds per month. Their impact

on the community expenditure level, however, was quite important amounting for both products together to approximately 20 percent of the food bill. The other ten households reporting no purchases at all apparently had an adequate supply for home consumption or had to endure a shortage due to their poor economic situation.

Judging by the amounts spent on fruits and vegetables, these can be considered luxury items in campesinos' food purchases. Vegetables were purchased by 19 families but in very small quantities consisting mainly of tomatoes, peas, onions, carrots and hot peppers. The household range in vegetable expenditures was from $b 4.0 to $b 16.0 per month for an average of $b 6.85. Fruit purchases were smaller and less common. Only 12 households reported any use of fresh fruits. The household average of $b 4.70 per month had a range from $b 4.0 to $b 15.00 per month. In percentage terms, fruits and vegetables accounted for 6.3 percent of food expenditures.

Meat, which is a relatively expensive food in Achica Bajo, was bought by 13 households. The expenditures for these families varied from $b 7.0 to $b 42.0. Meat was the only food item for which price variations occurred. The cost per pound ranged from $b. 2.00 to $b 4.50, reflecting quality variations. A considerable portion of the quantity reported was plain grease purchased for cooking purposes. The weight average per household was 4.32 pounds per month. Aji, salt, and pepper, with an average of $b 3.35 per household, accounted for the 1.8 percent of condiments expenditure.

Beverage details

In the beverage category four kinds of drinks were reported. Together they accounted for 10.7 percent of the total food bill. Coffee and tea are used by virtually all the families, coffee by all but two, and tea by all but six. The average for coffee was .80 kilograms; for tea, .30 kilograms per household per month. The other two items reported under beverages were beer and alcohol. The consumption of beer was relatively low. The monthly average of only 1.9 bottles per household is low because it reflects expenditures by only seven of the 20 families interviewed. The remaining 13 households reported no usual purchases of beer at all. The use of alcohol seems to be more prevalent. Purchases ranging from half a bottle to two bottles per month were disclosed by 14 of the households. Using the entire sample, the average purchase of alcohol per household is computed at .70 bottles per month.

Other items reported under the purchases of groceries for home consumption were coca leaves and tobacco. The use of coca, at one time an indispensable article for campesinos, seems to be becoming less common. Only twelve households indicated purchases of coca leaves. Even so, and especially considering that its use is restricted to the mature family members, consumption of coca for chewing is still high. The reported purchases, ranging from one to four pounds for each of the twelve families, gives a householf average of 1.2 pounds per household.

Clothing details

Clothing purchases provide important information for the socio-economic study of rural communities in Bolivia. They provide additional data not only on campesinos level of living and their market participation, but on the cultural change that appears to be taking place among them more rapidly since the Agrarian Reform. In the past, campesinos dressed in home-made attires styled according to their native customs. Today the preference, especially in rural communities close to urban centers, is toward city-like manufactured clothes.

The case of Achica Bajo is typical of a community experiencing this substitution. The effect is greater on men who appear to see clothing as a strong status symbol. Women, although spending a larger share of the total expenditures on clothes, are more conservative. In them the change is reflected primarily in better quality or more expensive dresses but maintaining the native design. For children, clothing expenditures are lower, reflecting less expensive purchases and a high proportion of clothes sewn at home.

Men. In the sample the expenditures on men's clothes came to 32.8 percent of the total clothing bill (Appendix Table 54.) The average annual expenditure on men's clothing per household was $b 427.70, varying from $b 221 to $b 904 per year. This range excludes one household with no expenditures in the men's category. The five most important articles of clothing are, in average units per household, hats (1.55), pants (2.55), shirts (2.90), coats (1.80)

and shoes (1.55). Unlike food, price variations on clothing were considerable, largely reflecting quality differences. The unit price variations reported were largest for hats (from $ 25 to $b 65) and coats (from $b 40 to $b 100). Practically all clothing articles are purchased new at fairs.

Women. Purchases for women's wardrobe sum to 40.8 percent of the total clothing bill. This large share reflects principally a larger variety of articles purchased for women than men. The most reported articles for women and their annual averages were: hats (1.65), blouses (2.10), skirts (2.35), mantas or shawls (1.60), shoes (1.70) and shirts (2.20). Price variations were more extreme among the most expensive articles. Thus, the variations in price of mantas ($b 30 to $b 80) and skirts (b 40 to $b 110) were much wider than for blouses ($b 25 to $b 40) and hats ($b 22 to $b 35). The average expenditure for women per household was $531.60 per year, or $b 103.90 more than for men. The household range, excluding again one case with no expenditures reported in the women's category, was from $b 309 to $b 942 per year.

Children. Expenditures on childrens' clothes were lowest of the three categories. It reached only 19.3 percent of the clothing expenditure bill. The average per household amounted to $b 251.50 or less than half of the average computed for women. It should be noted, however, that five households reporting no expenditures on children at all affected considerably the average quoted. For the remaining 15 households, the variation was from $b 40 to $b 973 per year.

Children's most purchased articles with their corresponding household averages were hats (2.05), shirts (3.50), skirts (1.95), and pants (2.70).

The remaining items in the clothing expenditure group were two kinds of clothing. Tocuyo, a course cotton fabric, has a wide use in home manufactured items such as shirts and underwear. Bayeta, produced by the campesinos themselves, is a heavy woolen material. It is used mainly for ponchos, shawls and shirts. Only nine households reported bayeta purchases, all of these in order to complement their own production.

The average per household for each of the clothing articles purchased by the campesinos of Achica Bajo would be encouraging signs of progress if compared to those of most Altiplano communities. Despite this, however, they indicate the meager wardrobe of the average campesino. Moreover, the averages quoted are not for individual but for entire households.

Medical expenses

Most of the campesinos of Achica Bajo are aware of the medical facilities available in La Paz or Viacha. Due to their poor economic situation, however, they seem to make little use of them. The annual average medical expenditure computed gave only $b 42.65 per household (Table 31). This figure includes medical services and drug purchases. Eleven of the 20 households interviewed reported payments during the year to doctors, nurses, or practicantes ranging from $b 10 to $b 165. The balance of the reported medical expenditures was for purchases of

medications. These were reported by 17 households with their annual totals varying from $b 8.0 to $b 55.0.

Transportation expenses

These expenditures consisted of bus or truck fares for trips to La Paz and fairs. The frequency of these trips varied considerably among households, with the resulting disparity in annual expenditures. A few families reported trips for a family member taken at least twice a week, estimated their annual expenditures on transportation at about $b 400 per year (Table 31). On the other extreme were most of the households with their annual expenditures below $b 100. One-way fares were most commonly reported (La Paz - Viacha) at $b 2.0 in bus, or $b 1.5 in open trucks. The charge per quintal of freight between the same points was one peso ($b 1.00).

Educational expenses

The attendance of children to school in Achica Bajo is not free. The annual tuition cost per child is $b 65.0 in addition to other necessary expenses. This charge constitutes a real obstacle for the attendance of all children to school, especially if they belong to families with several children of school age, or if they do not have a stable income. The total cost per year including expenses for books and supplies as reported in the survey varied between $b 95 and $b 150 per student. Due to the different number of children attending school per household, total annual expenditures in education varied from $b 100

to $b 395 per household. The overall community average for educational expenses per household was calculated at $b 157.40 (Table 31).

Services

Seventy percent of the expenditures on services were to barber shops. The remaining 30 percent was made for religious and lawyer services, but were reported by only four households.

Entertainment expenses

The entertainment category is made of rough estimates of disbursements made during holidays in an entire year. It was difficult to determine precisely the amounts spent by each of the families surveyed. When asked, however, how much the average family spends during holidays each year, most campesinos quoted figures around $b 200. The most common disbursements were payments for bands, alcohol and custom dresses. The annual average of $b 175 excludes disbursements made by prestes. The cost of being honored as preste is very high indeed. Of the 20 heads of households interviewed, nine acknowledged having been prestes sometime in their lives with their expenses ranging from $b 1,000 to $b 3,000. Custom requires a preste to provide food, drinks and music for all his guests during an entire holiday which may last from one to three or more days.

The last two categories in current consumption expenditures were contributions and miscellaneous items. The total annual contributions averaged $b 16.55 per household, mostly made to the local cooperative.

Valuation Summary of Assets

The total value of assets in Achica Bajo is estimated at $b 372,558 (Table 33). This valuation excludes land, dwellings and home manufactured goods for which only arbitrary values could be assigned. For this reason they were not included. The total value indicated is formed by private assets totalling $b 331,518 and communal assets of $b 41,040.

Table 33. Value of private and communal assets, Achica Bajo, 1967

	Table source	Household averages	Total Community
		$b	$b
Private assets			
Household durables	41	936.0	117,936
Farm improvements	44	70.5	8,883
Farm equipment and tools	45	156.4	19,706
Livestock	34	1,468.2	184,993
Total		2,631.1	331,518
Communal Assets			
Cooperative		3,590.0	
School		37,450.0	41,040
Total value			372,558

Little can be said of the aggregate value of assets in Achica Bajo by itself. If similar data were available for other communities some information about their social and economic situation could be deduced. In the case of Achica Bajo it can be said that the bulk of capital investments appears to be in livestock (Table 34) and household durables.

Table 34. Value of livestock inventory in Achica Bajo, 1967

	Inventory Sept. 1967	Price	Value
		$b	$b
Sheep	1,649	45.0	74,205
Cattle	97	900.0	87,300
Hogs	184	100.0	18,400
Chicken	407	12.5	5,088
Total			184,993

CONCLUSIONS

This section includes a listing of the analysis and results obtained from the survey of Achica Bajo. They constitute the community bench marks for 1967.

(1) The size of the population and its estimate rate of growth, are indicative of the population pressure on the scarce agricultural resources of the country.

(2) The aggregate community income was calculated at $b 6,435,071 (US $36,246) in 1967. Cash income accounted for 83% and income in kind for 17%.

(3) The income per capita in the country was estimated at $b 732 (US $61) in 1967 against national per capita GNP in 1965 of $b 1740 (US $145).

(4) In 1967, employment earnings accounted for 47 percent of the aggregate community income, agriculture for 40 percent and commerce for the remaining 13 percent.

(5) Earnings per man employed averaged $b 1,486 (US $124) per year or $b 124 (US $10) per month.

(6) Judging from inventory value of private and commercial assets the investment rate in the community is insignificant. Giving present income levels little can be done to improve the internal investment capacity of the community.

(7) The ratio between capital (farm improvements, equipment, tools and livestock) and labor (males in productive age group, 15 to 50) is $b 2,188 (US $182) per man.

(8) Agriculture is traditional and primitive as in most of the Altiplano. Its inefficiency is reflected in its low crop yields.

(9) In 1967, 48 percent of total community land was crop land. Cultivated land amounted to 62 percent of the crop land.

(10) Barley hay represented 70 percent of the area planted in the period 1966-1967, potato crop for 17 percent and quinoa for 13 percent.

(11) Crop yields in 1967 per hectare were 3,105 lbs. for potatoes, 23.5 quintales for barley hay and 698.7 lbs. for quinoa. Normal yields per hectare for the community are potatoes 10,000 lbs, barley 30 quintales and quinoa 100 lbs. Yields reported by the nearby Patacamaya Experimental Station with adequate irrigation, seed and use of fertilizers were 35,000 lbs. of potatoes, 80 quintales (dry weight) of barley, and 11,000 lbs. of quinoa per hectare.

(12) Seed inputs per hectare were 187 lbs. for barley, 1,341 for potatoes and 58 lbs. for quinoa.

(13) Low agricultural productivity was due to scale of individual farm operation; low soil quality; poor irrigation; lack of extension service, use of fertilizers, and adequate production techniques. In addition to these permanent problems the 1966-1967 harvest was severely affected by climatic conditions.

(14) Livestock industry is not significant. Thus, while taking 55 percent of the total value of private assets it contributes 29 percent to the aggregate community income.

(15) Among the adverse factors affecting livestock activity are; poor breed, low nutritional content of natural pastures, absence of concentrated feed and inadequate management practices.

(16) The natural rate of population increase was calculated at 6.9. Excluding migration considerations the population of Achica in 1980 can be estimated at about 670 persons.

(17) In order to maintain or improve income levels in the community this growth of population implies greater outside employment or improvements in agricultural productivity levels.

(18) Sixty-two percent of the population, 7 years or over, received at least one year of schooling.

(19) The literacy ratio indicates that 58.8 of the population 7 years or over are literated.

(20) Despite recent progress in education 47.4 percent of the children in school age (7 to 14 years) were not attending school.

(21) Of the annual expenditures account, the percent of major consumption categories were food and beverages 47.4 percent, clothing 28.1 percent, educational 3.4 percent and entertainment 3.8 percent.

(22) Per capita annual expenditures of major consumption categories were: food and beverages $b 465 (US $39), clothing $b 276 (US $23), educational $b 33 (US $3), entertainment $b 37 (US $3).

(23) Per capita consumption of selected food items per month:

Bread	39.13 units	Rice	3.37 lbs.
Wheat	.63 lbs.	Noodles	2.50 lbs.
Cotton	4.03 lbs.	Sugar	3.19 lbs.

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APPENDIX

Appendix Table 35. Climatological summary[a], Station Viacha, La Paz Department--Latitude: 16° 39' S, Longitude: 111° 49' W, Elevation: 3800 mts

	Temperature[b] (°C)					Precipitation (mm)		
	Means			Extremes		Totals		
Month	Daily maximum	Daily minimum	Monthly	Record highest	Record Lowest	Mean 1957-66	1966	1967
January	18.0	2.8	10.4	23.0	-1.5	67.4		76.2
February	16.8	3.5	10.1	20.5	-1.5	49.1		93.8
March	15.7	2.7	9.2	19.0	-1.0	47.9		58.6
April	16.7	-1.6	7.5	20.0	-5.5	17.9		23.0
May	15.0	-2.7	6.2	18.0	-8.0	7.2		18.3
June	13.9	-7.9	3.0	16.5	-13.5	2.8	0.0	
July	14.5	-8.1	3.2	16.5	-13.0	0.3	0.0	
August	17.2	-6.9	5.1	19.0	-13.0	0.1	0.0	
September	17.6	-1.8	7.9	21.0	-10.0	11.6	0.0	
October						12.6	12.7	
November						23.1	28.2	
December						56.6	54.4	
Year						296.6		365.2

[a]prepared from data provided by Ministry of Agriculture, Department of Meteorology.

[b]1966-1967 averages.

Appendix Table 36. Bolivian Ministry of Agriculture, Department of Soils, soil analysis, location-Achica Bajo, September 1967

Sample	Pit	Depths in mts	Saturation percemt	Bulk density	Specific weight	Percent total porosity	Percent sand	Percent silt	Percent clay	Texture
1	1	0.00-0.20	26.53	1.51	2.59	58.30	84.48	15.56	1.96	sandy
2	1	0.20-0.30	49.80	1.37	2.57	53.30	40.48	22.56	36.96	clay loam
3	1	0.50-1.00	32.00	1.39	2.61	53.26	64.48	29.56	5.96	sandy loam
4	2	0.00-0.10	28.60	1.45	2.54	57.08	69.20	15.84	14.96	sandy loam
5	3	0.00-0.50	47.20	1.24	2.64	46.96	50.48	21.56	27.96	sandy clay loam
6	4	0.00-0.30	62.64	1.23	2.33	52.78	31.20	41.94	26.96	loam
7	4	0.40-0.50	27.00	1.44	2.66	54.13	81.20	14.84	3.96	loamy soil
8	5	0.00-0.20	44.00	1.24	2.34	52.99	24.48	54.56	20.96	silt loam
9	5	0.20-0.60	34.80	1.32	2.46	53.65	35.28	27.72	37.00	clay loam
10	6	0.00-0.30	26.20	1.46	2.64	55.30	67.28	20.72	12.00	sandy loam
11	6	0.40-0.80	20.00	1.62	2.64	61.36	94.60	2.28	3.12	sandy
12	6	1.00-1.30	37.00	1.46	2.68	55.26	55.04	13.84	31.12	sandy clay loam
13	7	0.00-0.20	39.50	1.40	2.55	54.90	71.04	17.84	11.12	sandy loam
14	7	0.30-0.70	48.00	1.46	2.50	58.40	35.04	27.84	37.12	clay loam
15	7	0.70-1.20	40.00	1.40	2.55	54.90	44.04	28.84	27.12	loam

Appendix Table 36. Continued

Sample	pH	c.E. mmhos	Ca^{+} Mg^{++} me/1	K^{+} me/1	Na^{+} me/1	$HCO3^{-}$ me/1	$Cl.^{-}$ me/1	$SO4^{=}$ me/1	Organic carbon	Organic matter	Phos-phorus kgrs/ha.
1	7.0 N	1.20	6.5	1.34	6.50	1.00	3.00	8.57	0.756	1.30 M	8.82 M
2	7.2 N	4.00	20.0	2.20	25.00	2.00	1.25	35.00			2.94 B
3	7.4 LA	4.80	43.5	2.50	23.00	1.75	1.25	38.00			86.24 A
4	6.7 la	0.80	7.0	0.56	1.25	0.75	1.77	4.60	0.840	1.43 M	8.82 M
5	7.4 LA	1.80	9.0	1.00	10.00	10.00	1.25	4.30	1.780	3.06 A	11.76 A
6	6.6 la	0.48	2.0	0.30	0.15	1.50	1.25	T	1.680	2.89 A	9.80 M
7	7.3 LA	0.55	3.0	0.35	0.20	1.00	0.75	T			17.64 A
8	7.3 LA	0.60	3.5	0.25	1.00	2.25	0.37	T	1.480	2.54 A	17.64 A
9	7.0 N	0.44	2.0	0.20	1.25	0.75	2.00	T			9.01 M
10	8.2 A	28.00	64.0	13.80	165.00	9.00	152.50	126.00	0.970	1.67 M	117.60 A
11	7.6 LA	3.20	22.0	1.24	10.70	1.75	12.50	17.04			41.15 A
12	7.7 LA	0.80	7.0	0.20	0.17	1.75	2.00	T			14.11 A
13	6.8 N	4.40	20.5	3.16	21.30	3.75	13.75	25.71	1.610	2.77 A	33.32 A
14	7.8 LA	1.80	15.0	0.84	5.70	2.50	10.75	4.30			17.72 A
15	7.2 N	0.60	3.0	2.38	0.17	3.00	1.50	T			8.82 N

References:

N = neutral
LA = slightly alkaline
la = slightly acid
M = moderate
B = low
A = high

Appendix Table 37. Number of children born and died in twelve families selected at random in the community of Lacapucara, 1967

	Number			Cause and age[a] of death			
	Born	Alive	Died	Diptheria	Whooping cough	Typhoid	Unknown or others
1)	7	5	2	7y			3y
2)	8	5	3				10d, 1m, 1y
3)	10	7	3	12y			1m, 15d
4)	5	2	3	3y			3m, 1m
5)	9	6	3	11y			3y, 1m
6)	8		8	7y, 5y	15y, 1y	9y	
7)	10	4	6	4y	1y		15d, 10d, 1m 2m
8)	1	1					
9)	9	3	6	14y		1y	1m, 7y, 15d
10)	7	5	2			11y, 9y	
11)	2	2					
12)	8	5	3	N.A.			
TOTAL	84	45	39				
Average	7.0	3.75	3.25				

[a] y = years
m = months
d = days

Appendix Table 38. A family history of fertility and mortality in the community of Lacapucara, 1967

Name	Kinship	Born[a]	Died[a]	Cause
Andres Velazco Salinas	father	1924		
Natividad Cuir	mother	1921	3-10-65	Diptheria
Bonifacio	son	12-6-47	1-10-48	Unknown
Daniel	son	1949		
Geronimo	son	9-30-50	3-2-65	Diptheria
Daria	daughter	12-19-52	1959	Dysentery
Martiriano	son	4-8-54	4-12-54	Unknown
Porfirio	son	9-15-59		
Salomon	son	8-9-59	1960	Measles
Pastora	daughter	7-24-61		

[a]When month and date were indicated, data were obtained from written records.

Appendix Table 39. Distribution of households in Achica Bajo by size and years of schooling of heads of household, 1967

Years of Schooling	Number of members in household					
	1 - 2	3 - 4	5 - 6	7 - 9	10 or over	Total
none	19	20	16	8	1	64
1 - 2	0	5	6	4	1	16
3 - 4	4	9	16	9	1	39
5 - 6	0	1	1	2	0	4
over 6	1	1	1	0	0	3
TOTAL	24	36	40	23	3	126

Appendix Table 40. Distribution of households in Achica Bajo by size and knowledge of Spanish of household head, 1967

Number of members in household	Spanish speaking		Not Spanish speaking	
	Count	Percent	Count	Percent
1 - 2	7	11.5	17	26.2
3 - 4	15	24.6	21	32.3
5 - 6	23	37.7	17	26.2
7 - 9	14	22.9	9	13.8
10 and over	2	3.3	1	1.5
TOTAL	61	100.0	65	100.0

Appendix Table 41. Inventory and value of household durable[a] goods, Achica Bajo, 1967

Households	Bicycle units	Radio units	Sewing machine units	Tin Roofs	Anafes units	Metalic pots units	Tables units	Beds units	Glass windows units	Value misc. items $b	Total value $b
1			1			1	1	1	2	230	910
2					1					170	230
3	1	1		1	1	3	1	1		190	1,470
4			1		2	1		2		280	910
5			1	1	1		1	2	2	320	1,230
6	1	1		1		2				200	1,570
7	1									180	580
8		1			1	1	1	1		140	780
9				1		1	1	1	2	250	820
10										230	230
11	1		1		1	1				310	1,050
12	1	1	1	1	1	1	1	2	2	365	2,115
13	1	1			1	3		1		295	1,195
14	1				1	2		1		140	750
15		1	1			2	1	1		210	1,150
16		1			1	3	1	1	1	475	1,305
17										260	260
18			1		1	2				180	690
19	1			1		3	1	1	1	210	1,110
20						1				170	200
21			1			1				140	630
22	1	1		1	1	3	1	1		220	1,410
Household averages	.41	.36	.36	.32	.59	1.41	.45	.73	.45	235	936
Total community	52	45	45	40	74	178	57	92	57	29,610	117,936
Percent households without item	59	64	64	68	45	23	55	41	55		
Average purchase price[b]	$b 380	320	425	255	52	21	48	75	54		

[a]Includes only purchased durable goods.

[b]Variation was considerable due to time differences and purchase of new or used goods.

Appendix Table 42. Land tenure, and land use, Achica Bajo, 1966-1967

	Land Tenure					Land Use								Area planted 1966-1967		
	Size of holding	Number of parcels	Size of sayaña		Size range of ayñocas	Pasture		Crops		Farm-stead		Non-culti-vable				
	hectares		H	%	hectares	H	%	H	%	H	%	H	%	HA	%[d]	no.parcels
1	1.80	9	1.40	78	.04-.05	1.00	55	.50	28	.05	3	.25	14	.35	70	6
2	2.40	8	2.00	83	.02-.06	1.30	54	1.00	42	.10	4	0.00		1.00	100	8
3	1.60	7	1.40	88	.02-.03	1.20	75	.30	19	.10	6	0.00		.30	100	4
4	8.70	20	5.00	57	.10-.20	2.50	29	5.00	57	.20	2	1.00	12	2.80	56	6
5	6.10	5	5.50	90	.02-.20	1.50	25	2.80	46	.20	3	1.60	26	1.50	54	9
6	3.20	10	3.00	93	.02-.03	1.00	31	1.50	47	.20	6	.50	16	1.05	70	11
7	6.80	26	4.00	59	.10-.15	1.00	15	4.60	67	.20	3	1.00	15	2.25	49	8
8	4.50	11	3.30	73	.10-.20	1.50	33	2.00	44	.25	6	.75	17	1.20	60	10
9	2.20	6	2.00	91	.02-.05	1.30	59	.80	36	.10	5	0.00		.50	63	4
10	6.20	20	4.50	73	.05-.15	2.00	32	3.00	48	.10	2	1.10	18	2.30	77	9
SAMPLE TOTAL	43.50	122	32.10		.49-1.12	14.30		21.50		1.50		6.20		13.25		
Farm average	4.35	12.2	3.21		.05-.11	1.43		2.15		.15		.62		1.33		
Total community	561[a]	1574	414		147	180[b]		271		19		91[c]		167		
Percentage	100		74		26	32		48		4		16		62[a]		

[a]Average x 129 HH.

[b]Average x 126 HH.

[c]Includes land of 3 HH absent.

[d]Percent of total crop land.

Appendix Table 43. Acreage and crop production, Achica Bajo, 1966-67

	Area planted	Potatoes				Barley Hay				Quinoa			
		Area	Seed	Production 1967	Production Normal[a]	Area	Seed	Production[b] 1967	Production Normal[c]	Area	Seed	Production 1967	Production Normal[d]
	hectares	HA	lbs.	lbs.	lbs.	HA	lbs.	~~99~~	~~99~~	H	lbs.	lbs.	lbs.
1	.35	.05	110	250	500	.20	60	5	6	.10	6	100	100
2	1.00	.10	215	500	1,000	.75	175	17	23	.15	5	115	150
3	.30	.05	150	50	500	.20	25	8	6	.05	2	0	50
4	2.80	.40	600	1,200	4,000	1.80	250	40	54	.60	20	400	600
5	1.50	.25	325	500	2,500	1.25	315	26	38				
6	1.05	.15	250	200	1,500	.70	125	15	21	.20	5	115	200
7	2.25	.60	550	3,000	6,000	1.50	300	38	45	.15	6	120	150
8	1.20	.20	250	400	2,000	.80	165	15	24	.20	6	130	200
9	.50	.05	150	300	500	.35	100	14	11	.10	5	100	100
10	2.30	.35	350	500	3,500	1.25	225	40	53	.20	5	135	200
Sample TOTAL	13.25	2.20	2,950	6,900	22,000	9.30	1,740	218	281	1.75	60	1,215	1,750
Farm average	1.33	.22	295	690	2,200	.93	174	21.8	28.1	.18	6	122	175
Total community	167.0	28.0	37,170	86,940	277,200	117.00	21,924	2,747	3,541	22	756	15,372	22,050
Percent	100	17				70				13			

[a]Secondary sources: 10,000 lbs. per Ha.

[b]In dry weight (75 percent of green yield)

[c]30 ~~99~~ per HA

[d]100 lbs. per HA

Appendix Table 44. Inventory and value of farm improvements, Achica Bajo, 1967

	Yards			Wells			
	No.	meters	Value $b	No.	Deep meters	Value $b	Total value $b
1	1	6 x 6	70	1	3	20	90
2	1	8 x 7	60	1	2	10	70
3	2	4 x 4	40	2	2	30	70
4	1	6 x 6	45	1	2	20	65
5	1	5 x 5	60	1	2	10	70
6							
7							
8	1	4 x 3	20				20
9	1	7 x 8	50	2	3	30	80
10	2	5 x 3	80	1	10	50	130
11	1	10 x 10	100				100
12	1	6 x 6	60	1	5	20	80
13	2	9 x 9	200	1	4	10	210
14	1	5 x 5	25				25
15	1	8 x 10	125	1	4	15	140
16	1	5 x 5	85	1	8	20	105
17	1	6 x 6	50	2	3	15	65
18	2	6 x 6	40				40
19				1	2	10	10
20	1	8 x 6	60	1	3	15	75
21	1	10 x 10	80	1	4	25	105
22	1	6 x 6	45				
Farm average	1.05		58.9	.82		13.6	70.5
Total Community	132			103			8,883

Appendix Table 45. Inventory and value of farm equipment and tools, Achica Bajo, 1967

Households	Wood plow	Pick	Shovel	Sickle	Hoe	Tongs	Hammer	Hand saw	Wheel barrow	cane knife	Iron plow	Total Value
	units	units	units	units	units	units	units	units	units	units	units	$b
1	1	1	1	5								90
2	1	1	1	5	1	1	1	1				183
3	1	1	1	3		1		1				141
4	1	1	1	3			1	1	1	1		266
5	1	1	1	2								90
6	1	1	1	2						1		110
7	2	1	2	3	1			1				190
8	1	1	1	3	1		1					145
9	1	1	1	4		1						117
10	1	1		1								56
11	2	2	1	8								181
12	2	1	2	2	1	1	1					184
13	2	2	1	4		1			1			231
14	1	1	1	2		1					1	290
15	2	1	1	3		2	1	1				206
16	2	1	1	3				1				134
17	2	1	1	5		1						140
18	1	1	1	5	1		1	1		1		208
19	2	1	1	3	1	1		1				191
20					1	2						35
21	1	1	1	8								101
22	1	1	1	3	1	1		1				151
Farm average	1.3	1.0	1.0	3.3	.4	.6	.3	.4	.1	.1		156.4
Total community	164	126	126	416	50	76	38	50	13	14	6	19,706
Percent farms without item	5	5	9	5	64	50	73	59	91	86	5	
Average purchase price $b	35	15	18	6	16	10	20	35	80	25	150	

Appendix Table 46. Number and inventory changes of sheep in Achica Bajo, 1966-67

	Normal herd size 1962-65	beginning inventory[a] September 1966	Inventory changes				Ending inventory[a] September 1967	Estimated	
			Died	Consumed	Sold	Carry over[b]		Lambs as of Sept. 67[c]	Total herd size, Sept. 67
	15	18	3	4	1	2	12	4	16
	30	15	2	5	0	12	20	7	27
	0	4	0	2	0	2	3	1	5
	20	18	3	4	0	1	12	4	16
	15	15	3	3	0	1	10	4	14
	5	2	2	1	0	3	2	1	3
	10	3	2	1	0	4	4	1	5
	20	17	2	4	1	2	12	4	16
	10	8	3	2	0	2	5	2	7
	3	3	1	0	0	2	4	2	6
	50	20	2	6	0	6	18	6	24
	25	20	1	7	2	6	16	5	21
	10	16	2	5	0	7	16	6	22
	34	35	4	3	3	13	38	10	48
	20	30	2	4	0	10	34	12	46
	40	9	0	3	3	8	11	4	15
	20	8	1	0	0	3	10	4	14
	25	20	2	3	4	14	25	9	34
	6	3	1	3	0	3	2	0	2
	5	3	1	1	0	2	3	1	4
	40	15	7	5	0	7	10	4	14
	35	20	2	4	2	8	20	10	30
Total Sample	438	302	46	70	16	118	288	101	389
Farm average	19.90	13.72	2.09	3.18	.73	5.36	13.09	4.59	17.68
Total Community	2507	1729	263	401	92	676	1649	579	2228
Percent of beginning INV	145.0	100.0	15.2	23.2	5.3	39.1	95.4	33.5	128.9

[a]No. of animals one year or older

[b]No. of lambs born before Sept. 1966 carried over

[c]Assuming a 35 percent survival rate.

Appendix Table 47. Number and inventory changes of cattle in Achica Bajo, 1966-67

	Normal herd size 1962-1965	Beginning inventory Sept. 1966	Inventory changes			Ending inventory Sept. 1967		
			Died	Born or Sold	purchased	Bulls	Cows	Total
	2	4	1	1			2	2
	3	3				1	2	3
	0	1			1		2	2
	2	3		1	3	1	4	5
	3	2		1	2		3	3
	2	1	1					0
	4	1					1	1
	2	2			1		3	3
	3	3				1	2	3
	0	0						0
	7	7				2	5	7
	2	4		2	2	2	2	4
	5	4		1			3	3
	2	2			2		4	4
	2	3			2	2	3	5
	4	2		1			1	1
	4	4				1	3	4
	5	5	1		2	2	4	6
	2	3				1	2	3
	2	1					1	1
	5	5				2	3	5
	5	4		1	2	2	3	5
Total sample	66	64	3	8	17	17	53	70
Farm average	3.00	2.91	.14	.36	.77	.77	2.41	3.18
Total community	378	367	18	45	97	97	304	401
Percent of beginning inventory	103.0	100.0	4.9	12.3	26.4	26.4	82.8	109.3

Size of sample = 22.

Appendix Table 48. Number and inventory changes of hogs in Achica Bajo, 1966-67

	Normal herd size 1962-1965	Beginning inventory Sept.1966	Inventory changes				Ending inventory Sept. 1967
			Died	Consumed	Sold	born or purchased	
	0	0					0
	0	0					0
	0	0					0
	4	2	2		1	3	2
	2	2	2			4	4
	1	0					0
	2	3	1		2	1	1
	0	0					0
	0	1					1
	1	1					1
	0	1			1	1	1
	1	1		1		1	1
	0	0					0
	4	3		1	1	2	3
	2	2		2		6	6
	0	0					0
	5	4	1		2	5	6
	3	1	1				0
	0	0					0
	6	3	3			1	1
	2	2			1	4	5
Total sample	33	26	10	4	8	28	32
Farm average	1.50	1.18	.45	.18	.36	1.27	.145
Total community	189	149	57	23	45	160	184
Percent of beg-ginning inv.	1268	100	38.3	15.4	30.2	107.4	123.5

Appendix Table 49. Number and inventory changes of chickens in Achica Bajo, 1966-67

	Normal flock size 1962-1965	Beginning inventory Sept. 66	Inventory changes				Ending inventory Sept. 67
			Died	Consumed	Sold	Born	
	8	9	6			1	4
	0	0					0
	0	0				2	2
	6	2					2
	10	6		1	1		4
	1	2			2	1	1
	3	2	2				0
	5	3	1	1		3	4
	2	2					2
	0	1					1
	7	3	1	1		1	2
	1	2		2	1	6	5
	7	8		1	3	5	9
	6	2	1		1	6	6
	4	3		2		3	4
	0	4				1	5
	2	2					2
	5	6	2	3	2	8	7
	2	6	1		1	2	6
	2	0					0
	0	0					0
	3	6	1		2	2	5
Total sample	74	69	15	11	13	41	71
Farm average	3.36	3.14	.68	.50	.59	1.86	3.23
Total community	423	396	86	63	74	234	407
Percent of beginning inv.	106.8	100.0	21.7	15.9	18.7	59.1	102.8

Appendix Table 50. Value distribution of crops and livestock production of 20 farms in Achica Bajo, 1967

Total production	Home consumption	Sales	Seed	Forage
$b	$b	$b	$b	$b
1975	1140	305	330	200
788	201	200	87	300
1635	687	303	245	400
1424	483	586	125	230
1079	309	305	165	300
840	343	32	165	300
1280	380	310	240	350
1446	369	685	242	150
1748	176	1130	242	200
1263	513	105	245	400
1180	410	255	165	350
1124	241	400	83	400
612	202	160	0	250
876	323	240	163	150
1025	350	160	245	270
1490	533	300	407	250
853	313	255	85	200
1333	381	715	87	150
1603	528	645	330	100
1781	715	468	248	350
Total sample 25,355	8,597	7,559	3,899	5,300
Average 1,268	430	378	195	265
Total community 159,768	54,180	47,628	24,570	33,390
Percent 100	33.9	29.8	15.4	20.9

Appendix Table 51. Employment earnings of 20 households, Achica Bajo, 1967

	No. of household members employed	Average daily wage $b	Estimated annual earnings $b	Percent
1	2	7.5	700.0	2.2
2	1	5.0	100.0	.3
3	1	8.0	144.0	.4
4	1	5.0	150.0	.5
5	2	6.5	1,380.0	4.2
6	1	18.0	4,140.0	12.7
7				
8	1	8.0	1,840.0	5.6
9				
10	2	8.5	3,910.0	12.0
11	3	8.0	12,420.0	38.0
12	1	5.0	100.0	.3
13				
14				
15	1	8.0	704.0	2.2
16	1	5.0	50.0	.1
17	1	5.0	100.0	.3
18	1	3.0	66.0	.2
19	2	10.0	3,640.0	11.1
20	1	15.0	3,250.0	9.9
Sample total	22		32,694.0	100.0
Household average	1.1	7.8	1,635.0	
Total community	139		206,010	

Appendix Table 52. Estimated incomes[a] of 20 households in Achica Bajo and projections for total community, 1967

	No. of members in household	Estimated annual cash income	Per capita
		$b	$b
	6	5,009	834
	2	3,031	1,515
	4	3,950	988
	7	4,320	617
	8	6,603	825
	6	3,992	665
	7	4,681	669
	3	2,630	878
	3	3,003	1,001
	9	5,600	622
	6	3,871	645
	3	3,478	1,159
	5	6,127	1,225
	6	4,416	736
	7	3,925	561
	5	4,014	803
	4	4,080	1,020
	6	4,756	793
	3	3,730	1,243
	5	4,311	862
Sample average	5.25	4,276.35	815
Projected community total	661[b]	538,820	

[a]Obtained by adding total expenditures exclusive of purchases of durable goods and farm equipment.

[b]Actual population 594; projection 11 percent overstated.

Appendix Table 53. Food and beverage monthly expenditures, Achica Bajo

Items	Sample household averages			Total community		
	Quantity	Price per unit	Value $b	Quantity	Value $b	Percent
Food						
Bread	184.50 units	.10	18.45	23,247	2,325	10.1
Wheat	2.95 lbs	1.00	2.95	372	372	1.6
Corn	19.00 lbs	.40	7.60	2,394	958	4.2
Rice	15.90 lbs	1.00	15.90	2,003	2,003	8.7
Wheat flour	3.30 lbs	1.00	3.30	416	416	1.8
Corn flour	2.90 lbs	.60	1.74	365	219	1.0
Noodles	11.80 lbs	1.20	14.16	1,487	1,784	7.8
Sugar	15.05 lbs	1.00	15.05	1,896	1,896	8.2
Potatoes	20.12 lbs	.80	16.10	2,535	2,029	8.8
Chuno (dry potatoes)	9.75 lbs	1.80	17.55	1,228	2,211	9.6
Vegetables			6.85		863	3.7
Fruits			4.70		592	2.6
Meat	4.32 lbs	3.20	13.83	545	1,743	7.6
Condiments			3.35		422	1.8
Beverages						
Coffee	.80 kgs	8.00	6.40	101	806	3.5
Tea	.30 kgs	8.00	2.40	38	302	1.3
Beer	1.90 bottles	3.80	7.22	239	910	4.0
Alcohol	.70 bottles	5.00	3.50	88	441	1.9
Various						
Coca leaves	1.20 lbs	6.00	7.20	151	907	3.9
Tobacco			2.25		283	1.2
Miscellaneous[a]			12.30		1,550	6.7
TOTAL per month			182.80		23,033	100.0
TOTAL per year			2,193.60		276,386	

[a]Mostly Shortening, soft drinks, and matches.

Appendix Table 54. Annual clothing and footwear expenditures, Achica Bajo, 1967

	Sample household averages			Total community		
	Units	Price per unit	Expense	Units	Expense	Percent
	number	$b	$b	number		
Men						
Hats	1.55	30.35	47.05	195	5,928	
Pants	2.55	35.65	90.90	321	11,453	
Shirts	2.90	23.02	66.75	365	8,411	
Coats	1.80	72.78	131.00	227	16,506	
Shoes	1.55	34.35	53.25	195	6,709	
Rubber sandals	2.40	8.17	19.60	302	2,470	
Others			19.15		2,413	
			427.70		53,890	32.8
Women						
Hats	1.65	29.52	48.70	208	6,136	
Blouses	2.10	30.55	64.15	265	8,083	
Skirts	2.35	57.34	134.75	296	16,979	
Shawls	1.60	63.28	101.25	202	12,757	
Shoes	1.70	27.26	46.35	214	5,840	
Shirts	2.20	22.30	49.05	277	6,180	
Rubber sandals	1.55	7.00	10.85	195	1,368	
Others			76.50		9,639	
			531.60		66,982	40.8
Children						
Hats	2.05	18.68	38.30	258	4,826	
Shirts	3.50	14.50	50.75	441	6,395	
Skirts	1.95	22.59	44.05	246	5,550	
Pants	2.70	20.85	56.30	340	7,094	
Shoes	1.50	22.27	33.40	189	4,208	
Rubber sandals	1.48	5.88	3.70	186	1,096	
Others			20.00		2,520	
			251.50		31,689	19.3
Bayeta (cloth)	7.05 mts	4.50	31.75	888	4,001	
Tocuyo (Cloth	12.20 mts	5.00	61.00	1537	7,686	
			92.75		11,687	7.1
TOTAL			1303.55		164,248	100.0

Appendix Table 55. Conversion table of measures.

1 meter = 3.28 feet

Temp in ^{o}F = Temp in $^{o}C \times \frac{9}{5} + 32$

1 litre = .88 quarts

1 inch = 25.4 millimeters (mm)

1 kilogram = 2.20 pounds

1 hectare = 2.47 acres

1 quintal = 100 pounds

1 Peso boliviano ($b) = 12 American dollars
(1967 Exchange rate)

GLOSSARY

Achicabaqueños	The people of Achica Bajo.
Agricultor	Farmer.
Aymara	Tongue of the Aymara Indians.
Campesino	Farmer.
Cholo	Half breed of European and Indian parentage.
Chuño	Freeze-dried potatoes.
Comerciante	Trader.
Conquistador	Conqueror.
Cooperativa Agraria	Agrarian Cooperative.
Cordillera	Ridge of mountains.
Desarrollo de Comunidades	Community Development.
Escolar	Student.
Hacienda	Landed property.
Jornalero	Journeyman.
Junta de Auxilio Escolar	School Council.
Labores de casa	Housekeeping work.
Llanos	Plain.
Obrero	Workman.
Oficinista	Office employee.
Poncho	Man's jacket.
Practicante	Practitioner.
Presente	Title describing a host.

GLOSSARY (Continued)

Quechua	Tongue of the Quechua Indians.
Servicio Militar	Military service.
Tapial	Mould for making mud-wall.