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An analysis of the Bolivian land reform by means of a comparison between Peruvian haciendas and Bolivian ex-haciendas

Melvin Burke
University of Maine

AN ANALYSIS OF THE BOLIVIAN LAND REFORM BY MEANS OF A COMPARISON BETWEEN PERUVIAN HACIENDAS AND BOLIVIAN EX-HACIENDAS

By

Melvin Burke

A.B., Wayne State University, 1960

M.A., Wayne State University, 1962

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I. INTRODUCTION

In April of 1952, the Movimiento Nacionalista Revolucionario seized power in Bolivia and in August of the following year passed the Decreto de la Reforma Agraria and proceeded to redistribute the land of the latifundios to the former Indian laborers. This paper intends to analyze the economic and socio-economic consequences of this Bolivian revolutionary land redistribution by means of a comparative study of Peruvian haciendas and Bolivian ex-haciendas in the Lake Titicaca region.

The present study will follow the plan thus indicated. The first section introduces the subject of land reform with a review of the literature and the description of a land reform situation. The second provides background to the Bolivian land reform. The third and fourth describe the area of study and the research methods used. The fifth and sixth sections analyze the Bolivian land reform by comparing haciendas and ex-haciendas in the Lake Titicaca region. The seventh section gives the analysis a national perspective by briefly investigating the impact of the land reform upon Bolivia's major agricultural regions. The last section summarizes the findings of this comparative study and attempts an evaluation of the Bolivian land reform.

II. DESCRIPTIVE MODEL OF A LAND REFORM SITUATION

> The reform of the institutions of land tenure, and its relation to economic development, is not a subject in its own right, but lies between different studies--economics, history, geography, anthropology and sociology. . . . Economists have neglected the subject, because it concerns the institutional framework which they accept as given; and this neglect is unfortunate, because it means that we have no accepted methods of analysis, and lack even proper terminology.[1]

This paper begins with a review of the literature on land reform and the construction of an abstract descriptive model of land reform in an underdeveloped South American country. In this model will be incorporated rigorous definitions, methods of analysis and standards of evaluation. After the model is constructed, it will serve as the reference framework for description, analysis, and evaluation of the Bolivian land reform.

A. The Economic Goals of Land Reform

In a nutshell, the situation under discussion is one where an underdeveloped country with a traditional agrarian economy characterized by a latifundio land tenure system institutes a land reform program to achieve "economic justice," promote economic efficiency, and ultimately induce economic development. The type of land reform and the relative stress put on the three goals of justice, efficiency, and progress differ in each particular case. In addition, there is no generally accepted terminology. Consequently, all of these terms must first be given operational definitions. An underdeveloped nation is one which is relatively poor in the sense of having a low real per

[1] Doreen Warriner, "Land Reform and Economic Development," Agriculture in Economic Development, ed. Carl K. Eicher and Lawrence W. Witt (New York: McGraw-Hill Book Co., 1964), p. 274.

capita income in comparison with other countries and more significantly in comparison with its own potential. This definition borrows heavily from Jacob Viner[2] and has the merit of being free from the implication that there is a limit to economic progress or that the road to development is along the path of industrialization. It does, however, use the orthodox measure of per capita income. Economic development is, therefore, a sustained increase in the real per capita income of a country. This is the progress achieved by increasing the quantity of the traditional factor of production capital along with an increase in the non-traditional inputs of education (human capital) and technology (quality of capital) at a rate which increases quantity of aggregate output exceeding that of population increases.[3] A traditional agrarian economy is one in which most of the economic resources of the nation are found in the agricultural sector. This sector is technologically backward as well as economically inefficient and stagnant relative to the non-agricultural sector of the economy and relative to the agrarian sectors of the more developed nations of the world.[4] Economic efficiency is the optimum utilization--employment and allocation--of society's resources in the production of goods and services in conformity to the community's wishes. A firm is efficient if it produces the greatest

[2] Jacob Viner, International Trade and Economic Development (Oxford: Oxford University Press, 1953), p. 98.

[3] Numerous economists have emphasized the importance of increasing inputs of capital to achieve progress, while in recent years a number of economists, such as Robert M. Solow, have demonstrated that technological change and education explain a large part of increases in national output over time. See, e.g., his article "Technical Progress and the Aggregate Production Function," Review of Economic Statistics, XXXIX (August, 1957), 312-320.

[4] Theodore W. Schultz, Transforming Traditional Agriculture (New Haven: Yale University Press, 1964), pp. 3-8.

output with given resources or--alternatively--a given output with the least input of resources. This definition does not use any particular average productivity measurement such as output per man-hour as the sole criterion of productive efficiency.[5] Nor does it ignore two major aspects of efficiency in an economy; namely, employment and consumer preference. Land tenure is the term used for all rights and relationships that have been created among men to govern their affairs with respect to the land. This definition borrows heavily from Philip M. Raup[6] and includes "land tenancy," which is the system under which land is operated and its product divided between the operator and owner. It is much broader than the traditional definition which only considers the legal relationships among men in relation to land. A latifundio land tenure system is one which is dominated by large landed estates alternately referred to as latifundios or haciendas. These enterprises are large livestock-cereal operations which utilize great quantities of land and labor combined with very little capital other than breeding livestock. They are usually absentee-owned and run on traditional (customary) rather than profit maximizing principles.[7]

[5]There are probably as many definitions of economic efficiency as there are individuals using the term. The definition above is generally accepted among economists. However, in the analysis of the Bolivian land reform various measurements of production efficiency will be examined. Another concept which might be of use in the evaluation of land reform programs is "incentive efficiency." See Harvey Leibenstein, "Allocative Efficiency vs. X-efficiency," American Economic Review, LVI (June, 1966), 392-415.

[6]Philip M. Raup, "The Contribution of Land Reforms to Agricultural Development: An Analytical Framework," Economic Development and Cultural Change, XII (October, 1963), 3.

[7]A latifundio is not a plantation. A plantation is usually highly capitalized and foreign owned. See Thomas F. Carroll for an elaboration of this distinction in "The Land Reform Issue in Latin America," Latin American Issues, 3rd edition, ed. Albert O. Hirschmann (New York: Twentieth Century Fund, 1961), pp. 163-165.

While most of the land is concentrated in these few large estates, they are typically coupled with a large number of small peasant farms (minifundios) and Indian communities (comunidades). The model is now restricted to South America, and especially the Andean region and republics. A complete understanding of this land tenure system is not possible without cognizance of its historic evolution. However, the previously stated limits of this paper precludes an elaboration on this point. Suffice it to say that the latifundio tenure system traces its origins to the late Roman and early European Medieval tenure arrangements fused with the American Inca land structure.[8] The process of land consolidation began with the conquistadores, proceeded through the colonial and Republican periods, and continues into the present century. It was essentially a redistribution of land without compensation by right of conquest--which leads us directly to the definition of land reform used in this study. Land reform is the legal expropriation of these landed estates with or without compensation and the redistribution of the land to the former agricultural laborers of the estates.[9] This is the traditional meaning of land reform which could be termed land redistribution. The much more inclusive definition of land reform currently in vogue, including all organized action designed to improve land tenure, tenancy, taxation, etc., is rejected because such an inclusive definition gives rise to confusion and is not specifically relevant to the Bolivian case. Economic justice is the

[8]David Weeks gives an excellent historic description of this tenure system in "The Agrarian System of the Spanish American Colonies," Journal of Land and Public Utility Economics (May, 1947), pp. 153-168.

[9]Edmundo Flores draws an interesting analogy between the present land reform programs without compensation and Lincoln's freeing of the slaves in the United States in Land Reform and the Alliance for Progress, Center of International Studies Woodrow Wilson School of Public and International Affairs, Number 27 (May, 1963), p. 10.

reduction of inequities in the social organization of economic activity. The authoritative ethic accepted is that of the government and the laws of the land which are assumed to exhibit the political consensus. This definition accepts the proposition that interpersonal comparisons of utility are not possible and therefore welfare comparisons are not subject to evaluation without accepting some ethic other than that of the economist himself. It also avoids rationalizing the status quo by ignoring such changes as income (land) redistribution through legislation, which may very well be the most significant and tangible result of land reform. This is especially true if the landowners are not compensated or are compensated with funds from the general budget of the government.

This exercise in semantics was carried out to avoid the tyranny of words which has given rise to so much confusion on the subject of economics and land reform. To further prevent misunderstanding, a digression is warranted to point out those issues of land reform which will not be given consideration in this paper. No questions will be entertained as to whether a country should institute a land reform program. No inquiry will be made into alternatives to land reform, such as taxation or colonization. It is also not the purpose of this study to determine whether land reform is a necessary or sufficient condition to achieve economic efficiency or progress. Although the analysis and conclusions of this study may imply certain courses of action, no direct confrontation of these important issues will be attempted. Rather, the comparative method used in this study dictates a before-and-after approach to the issue of land reform which can best be abstractly viewed by extending the conceptual scheme

one step further. This is accomplished by an apriori examination of the salient features of these latifundios which are deemed obstacles to economic justice, efficiency, and development, along with an inquiry into how the elimination of these obstacles will achieve the desired results.

B. Latifundios as Obstacles to the Goals of Land Reform

Before proceeding, it must be emphatically stated that, because of the lack of systematic quantitative research, much of what follows is not substantiated by facts. One of the purposes of the study carried out in the Lake Titicaca region was to confirm or negate these apriori arguments for and against land reform in Bolivia. In order to better understand how latifundios are an obstacle to economic justice, efficiency, and progress, and in order to examine the ways in which land reform proposes to eliminate these obstacles, the technical and institutional aspects of land reform will be discussed separately.

Of the two, the institutional aspect is less controversial, yet it presents a greater barrier to attaining the desired goals. Part of the difficulty is that it is less suited to quantitative description, analysis, and evaluation. The manner in which these large estates were acquired, the concentration of landed property in so few hands, and the less-than-progressive tenancy conditions have contributed in varying degrees to a general consensus that the system is unjust. This is most evident in respect to the Indian laborers. These colonos are traditionally and often quasi-legally tied to the landed estate. For the right to use a small parcel of the poorer quality land of the estate they must render to the hacendado their labor, tools, animals, and servitude

in varying degrees. Consequently there is little possibility of social or geographical mobility, reward is not commensurate with contribution, and exchange within the hacienda is substituted for markets. Thus the tenure arrangement precludes allocative and incentive efficiency. In addition, since the social position of the landlord often depends on the size of the hacienda and not the size of its profit, extensive ranching is promoted at the expense of national consumer preference for food crops which would require an intensive cultivation of the land. The surpluses which are not exported or conspicuously consumed by the absentee owners are often invested in agricultural land or urban real estate. This behavior, although rational from an individual point of view, is a relatively unproductive investment for the society as a whole.[10] Although the profit motive is not fully operative, production is a riskless undertaking since labor is a free resource, land is not taxed for all practical purposes, and land values increase with population pressure. Only if the landlord invests substantial amounts in land improvement, capital, or labor can he incur a loss. It is axiomatic that these tenure conditions are far from ideal for the promotion of economic development.

The technical aspect of the land reform issue is centered on the question of farm size measured in land area. Debate has been, and is being, focused on the relative productions, productivities, and growth potentials of large versus small farms. In short, what is the

[10] In short, they engage in what Harvey Leibenstein refers to as "zero-sum games," or those activities which, although individually profitable, do not increase national income. Economic Backwardness and Economic Growth (New York: John Wiley and Sons, Inc., 1963), p. 113.

technically optimum size enterprise? This aspect of land reform is a great deal more controversial than the institutional. The institutional features are separate from farm size since a small hacienda may also possess these characteristics. Very few economists will defend the tenure conditions on these large estates, but many rally to their defense in the name of large scale efficiencies and labor productivity, as Raup points out:

> We must recognize that one shibboleth of economic thought is a belief in the potential economies of large-scale production. On this point Marxian and non-Marxian economists typically see eye to eye. In Western economic thinking this is paralleled by a preoccupation with output per man hour as an appropriate measure of productive efficiency. These twin articles of faith have strongly influenced conventional economic thinking in Western countries about land reform.[11]

The technical argument against land reform is conducted on the level of the firm and relies heavily upon existing or potential economies of scale. These economies are only possible in large scale production because of the indivisibilities of certain production factors such as management and capital in the form of tractors, antiseptic animal baths, etc., which do not easily lend themselves to partition, thus precluding their use for small scale farming. It is further maintained that these scale economies exist in the purchase of seed, fertilizer, credit, etc., as well as in the sale of final products because of the ability of these large estates to bypass the middleman and obtain quantity discounts. All of the above leads to a relatively more technically efficient unit of production as measured by labor productivity.

Proponents of land reform, along with others who are only interested in the academic question of farm size and economies of scale,

[11]Raup, p. 17.

take the position that these size economies may or may not exist, and if they do exist, they are not being exploited under the circumstances. First, they point out that the superior management argument is without foundation in a situation where there is not only absentee ownership, but also absentee management. In addition, the nature of agricultural production is such that large estates quickly encounter diseconomies of management because of the inherent cyclical production of agriculture and a labor force dispersed over a large land area.[12] Secondly, almost all the capital and technological inputs such as fertilizer, seed, insecticides, etc., deemed most necessary and feasible in such a traditional agrarian economy are divisible. They are technically capable of application in small quantities, and offer the most immediate as well as greatest return on investment. Indeed, this argument is further developed by questioning the use of scarce foreign exchange to buy culturally-bound equipment such as tractors which are labor-saving in an economy with large numbers of underemployed. Finally, the land reform proponents ask why these scale economies of credit, buying, and selling are not realized--if, in fact, they do exist--since the latifundios do not invest heavily in capital equipment, nor do they use high-yield seed, fertilizer, or other inputs. In sum, no inefficiencies are to be expected from breaking up these large estates which are in large measure merely agglomerations of small Indian farms. For example, Don Kanel writes:

> Thus in terms of economies of scale per se, under static conditions, there is no overwhelming advantage to any particular size of farm. It seems to me, that more likely the advantage is with the small farms, at least in most types of farming.[13]

[12] J. M. Brewster, "The Machine Process in Agriculture and Industry," Journal of Farm Economics, XXXII (February, 1950), 69-80.

[13] Don Kanel, "Size of Farm and Economic Development," Land Tenure Center at the University of Wisconsin (April, 1965), p. 17. (Mimeographed.)

The question of an appropriate measurement of technological efficiency is also debated. Is the productivity index of output per labor input indicative of efficient resource utilization in an economy which is relatively labor abundant but land and capital deficient? One very interesting proposal is to use another criterion for efficiency; namely, "gross value productivity per acre above variable capital costs."[14] Erven J. Long elaborates on this below:

> Stated more simply, are the returns to non-labor resources higher on the larger or on the smaller farms? This is the question pertaining to the economics of farm size which is really relevant to land reform policy.[15]

This leads to the question of what indeed is the major source of high productivity? If it is not the allocation of land, labor, and capital using traditional techniques, but the use of new non-traditional inputs such as seed, fertilizer, breeding stock, etc., then the economies of size argument appears less plausible. The research, promotion, and introduction of these inputs appear to be a function of the state, as Don Kanel observes:

> Under modern conditions agricultural development depends on state responsibility for research and dissemination of information, and state and private (but off-farm) responsibility for the manufacture and timely coordinated distribution of the new production inputs, and on the development of marketing and credit agencies to serve the agricultural sector.[16]

[14] Erven J. Long, "The Economic Basis of Land Reform in Underdeveloped Economies," Land Economics, XXXVII (1961), 116-117.

[15] Ibid.

[16] Kanel, p. 14.

C. How Land Reform Achieves Its Goals

This completes the discussion on the ways in which haciendas are obstacles to justice, efficiency, and development. There remains the task of showing how land reform, with one bold stroke, proposes to achieve its goals. Land reform has immediate, short-run, and long-run economic aims. At the outset, the land is redistributed; this simultaneously frees the labor, redistributes the income, and creates small peasant-owned farming units. In this manner many gross inequalities are immediately eliminated by a change in the land tenure. In addition, conditions for short-run efficiency are set in motion. A labor market is created, incentives are augmented, and nutrition and human capital are increased. Allocative efficiency is improved by the creation of a labor market and the intensification of agricultural production of food products in conformity to national consumer preference. Labor becomes more mobile and freely seeks employment where its presence makes the maximum contribution to production. In addition, labor and leisure are divided in accordance with individual utility preference. Incentive efficiency is gained in the process since reward is now commensurate with effort. Theodore Schultz of the University of Chicago comments on the relationship of incentives to investment:

> The critical economic question, therefore, becomes: under what conditions does it pay to invest in agriculture? The implication is . . . that it will not pay unless the man who farms has the opportunity and incentive to transform the traditional agriculture of his forebears.[17]

Finally, technological efficiency is at least not diminished and may be increased by a greater output per land and/or capital input--two

[17]Schultz, p. 23.

very scarce factors of production. The long-run goal, economic progress, cannot be achieved except after a long period of time:

> Capital in farming is rarely concentrated, in a spatial sense, and its formation is heavily weighted by the time dimension. It accumulates by an incremental process that is best described as accretionary.
> . . . . . .
> The time spans required for effective operation of these accretionary processes are measured not in years but in generations.[18]

Only the "preconditions" for development, such as an increase in education, labor mobility, agrarian demand for manufactured products, and possibly the creation of governmental credit institutions and extension services, can be achieved in the short-run. However, the latter do not substitute for land reform, but only supplement it.

In summary, the greatest obstacle to the objectives of economic justice, efficiency, and progress is the institutional tenure arrangement of the latifundios. The economic impact of a land reform program will be primarily upon the labor force and in the short-run this can most easily be quantitatively analyzed in the controversial area of technical efficiency at the firm level.

This completes the abstract descriptive model of a land reform situation in an underdeveloped Latin American republic. A review of the literature was useful in describing the case, defining terms, providing methods of analysis, and setting standards of evaluation. The model will prove useful in the analysis and evaluation of the specific Bolivian land reform program. To begin, a very superficial background of Bolivia, its revolution of 1952, and its land reform will be sketched in the next section.

[18] Raup, p. 7.

III. BOLIVIA: PRE-REFORM ECONOMY, NATIONAL REVOLUTION, AND AGRARIAN REFORM

Any critical analysis of the Bolivian land reform must be preceded by at least an outline of the pre-reform economic situation. What follows in this section is not meant to be an exhaustive study of Bolivia's history, economy, land tenure system, or the 1952 revolution. Rather, its purpose is to provide a background for the analysis of the Bolivian land redistribution. Therefore, no more is attempted in this outline than the accumulation of evidence to provide the previously constructed model with facts from the special case of Bolivia.

A. Bolivia's Pre-Reform Economy

Bolivia is the third largest country in South America in land area with a territory exceeding 400,000 square miles, yet its population is estimated at less than four million. Prior to the revolution of 1952 and the land reform of the following year, Bolivia was an underdeveloped country with a traditional economy characterized by a latifundio land tenure system. Bolivia was both an absolutely and relatively underdeveloped nation. It was absolutely underdeveloped in the sense that it was un país pobre--a poor country. It was underdeveloped relative to other nations of the world and to its own potential. For example, in 1950--a year in which both an agricultural and demographic census was taken--the per capita national income was equivalent to $80. Its estimated 1,600 per capita daily intake of calories fell far short of the generally recommended minimum of 3,000. It is not surprising that the average life expectancy was 45 years, that one-third of all children died before the age of five, or that 70% of the population

was illiterate.[1] One could cite statistics ad infinitum confirming the fact that Bolivia was a very poor and underdeveloped country in every sense of the term.

The paradox lies in the fact that her immense land area, natural resources, and sparse population validates the oft-quoted phrase that Bolivia was a "begger on a throne of gold." The United Nations Technical Assistance Mission to Bolivia (the Kennleyside Report) acknowledged the abundant natural resource base of this nation.

> There are few material human needs that could not be satisfied by proper use of the rich soils, the mineralized rocks, the flowing waters of the Bolivian Republic. Food, shelter, clothing, power; all are available. There would seem to be no material reasons to prevent the people of Bolivia from living a life of reasonable comfort and contentment for many generations to come.[2]

There existed a multiplicity of explanations for this paradoxical contrast between the poverty of Bolivia and her potential wealth. A very plausiable explanation can be found in an examination of the dual economy of Bolivia. The agricultural sector was clearly differentiated from the non-agricultural sector, which comprised the extractive industries and the transport and trading activities associated with these mining operations. These two sectors were distinct and separate, resulting in the tendency of economists and others to ignore one while analyzing the other. This is unfortunate because while each sector had its particular problems, they supported and contained one another in a single vicious circle. This section will attempt to differentiate the

[1] Bolivia, Junta Nacional de Planeamiento, Plan Nacional de Desarrollo Económico y Social 1962-1971 (La Paz, 1961), passim.

[2] United Nations, Technical Assistance Administration, Report of the United Nations Mission of Technical Assistance to Bolivia (New York, 1951), p. 1.

basic from the secondary problems, to determine which problems arose in each sector, and to suggest ways in which each can be remedied and converted to a feedback mechanism.

The excellent Kennleyside Report was aware of this dual economy, its historic evolution, and its consequences:

> Until tin mining began its spectacular growth at the beginning of the present century, Bolivia remained a country, by and large, outside the main currents of world economy. The majority of its people derived their sustenance from a primitive self-contained agriculture, and were practically unaffected by the impact of modern money economy. With the beginning of metal ore exports, however, it became possible to import goods from abroad on an increasing scale. The mining population, and the expanding urban population which ultimately depended upon the income derived from mining, became dependent for their existence upon the exchange of their labour for food and other necessaries, thus becoming part of an expanding market economy. But this new trading economy remained divorced to an extraordinary degree from that of the rest of the country. The agricultural sector of the community continued to lead the same self-contained life as it had for centuries past, and Bolivia became a typical example of a split economy, part primitive and part trading. The dynamic impulses emanating from the new economy were absorbed by, but did not fundamentally affect, the old. . . . Increasing portions of the returns from exports were used for consumption rather than for further capital accumulation and investment in domestic enterprise. The static nature of Bolivian agriculture has tended to impede--if not arrest--the ordinary course of economic development.[3]

1. Mining Industry

In 1950, the Bolivian mining industry employed approximately 3% of the "economically active" population, contributed more than 25% of the gross national income of the country, and accounted for 95% of the total value of all exports.[4] If the output and employment of auxiliary industries were added to these figures, the economic importance of mining to Bolivia would be even more apparent. The production record of the

[3] Ibid., pp. 85-86.

[4] Plan Nacional 1962-1971, loc. cit.

extractive industry is one of long-run growth with cyclical instability as indicated below:

TABLE 1

THE RELATIVE IMPORTANCE OF TIN AND METAL EXPORTS TO THE BOLIVIAN ECONOMY
(official dollar values)

Year	Tin Exports	Tin as Percentage of All Metal Exports	Metal Exports	Percentage of Total Exports Represented by Metals
1938	17,343,733	69.44	24,975,761	91.18
1939	22,436,740	71.06	31,574,139	93.29
1940	35,513,511	74.24	47,830,036	95.99
1941	42,820,047	73.84	57,985,162	95.60
1942	43,933,000	69.55	63,158,453	96.19
1943	54,988,026	70.66	77,809,652	95.42
1944	53,112,692	73.21	72,545,001	93.67
1945	61,357,870	82.04	74,787,823	92.98
1946	53,725,318	79.96	67,190,003	91.23
1947	57,343,348	72.87	78,683,628	96.08
1948	80,241,291	72.38	110,856,752	98.30
1949	72,792,877	73.50	99,036,000[a]	97.90[a]
1950	72,044,586	81.14	88,788,435	94.38

[a]Metal exports for the year 1949 provided in thousands only, and the corresponding percentages computed on that base.

Source: Bolivia, Dirección General de Estadística y Censos, Revista Mensual, No. 62 (December, 1951), Tables 35-43, and data provided by Memoria Anual del Banco Central, 1948, as cited in Appendix 1 of The United Nations Technical Assistance Administration, Report of the United Nations Mission of Technical Assistance to Bolivia (New York, 1951), p. 120.

This table illustrates a number of very important relationships. First, there was the complete dependence of the nation upon metal exports to earn foreign exchange. Secondly, this one-product (tin) export economy was vulnerable to the world's fluctuating demand for non-ferrous metals. Finally, there is the indication that the industry was in a

state of relative decline. The numerous issues of foreign ownership, price instability, secular decline, etc. will not be discussed in this paper. More important for the purpose of this study is the fact that these substantial foreign exchange earnings failed to generate economic progress. Secondary, tertiary, and agglomeration economies did not materialize. The reasons for this are numerous, with the stagnant traditional agrarian sector being the greatest retarding factor.

2. Agriculture

Agriculture in Bolivia employed approximately 70% of the "economically active" population in 1950 but contributed only 30% of the gross national income and less than 3% of the total value of exports.[5] It has been estimated that roughly 40% of the nation's foreign exchange during the 1940's was absorbed by agricultural and similar imports, as shown in Table 2.

TABLE 2

SELECTED IMPORTS AS A PERCENTAGE OF TOTAL IMPORTS

Meat and dairy products	8	Rice	$2\frac{1}{2}$
Cereals and flour	10	Timber	$1\frac{1}{2}$
Sugar	8	Wool	$1\frac{1}{2}$
Petroleum and products	8	Cotton	$1\frac{1}{2}$

Source: Official statistics as cited by Harold Osborne, Bolivia: A Land Divided, 3rd edition, revised (London, 1964), p. 126.

The majority of these imports could have been produced in Bolivia. The low production and productivity of Bolivian agriculture at the time were

[5] Ibid.

reflected in the low standard of living of the people and the need to import food products. Statistics in general and particularly those on agricultural production and productivity are generally inaccurate and unreliable, but the tables below, based on the 1950 Bolivian agricultural census, reveal quantitatively this poor performance.

TABLE 3

OUTPUT AND PRODUCTIVITY OF SELECTED AGRICULTURAL PRODUCTS: BOLIVIA, 1950

	Hectares	Thousands of Kilos	Kilos per Hectare
Potatoes	113,152	189,384	1,674
Corn (grain)	116,052	129,701	1,118
Wheat	84,709	45,652	539
Barley (grain)	61,837	44,247	716
Barley (fodder)	35,076	47,087	1,342
Quinua	18,998	7,715	406
Rice	15,602	25,823	1,655
Ocas	18,335	27,667	1,509
Sugar	10,013	342,939	34,249
Habas	9,270	8,594	927
Cañahua	4,138	1,475	356
Coffee	3,395	2,530	745

Source: Bolivia, Oficina Nacional de Estadística y Censos, Censo Nacional Agropecuario de 1950 (La Paz, 1950).

TABLE 4

TOTAL NUMBER OF LIVESTOCK: BOLIVIA, 1950

Cattle	2,226,629	Llamas	1,043,392
Sheep	7,223,592	Alpacas	135,332
Pigs	508,782	Horses	157,923
Fowl	1,760,229	Mules and Burros	464,656

Source: Bolivia, Oficina Nacional de Estadística y Censos, Censo Nacional Agropecuario de 1950 (La Paz, 1950).

Every study of Bolivian agriculture at that time arrived at the same conclusion; namely, that when compared with other nations of the world, its own potential, or its past performance, Bolivian agriculture was both absolutely and relatively unexploited as well as backward and stagnant. A United Nations study pointed out that "no significant progress was made in agriculture between 1930 and 1950."[6] Throughout the decade preceding the 1952 revolution, less than 1% of all imports were agricultural capital goods.[7] It has been estimated that in 1950 there were only slightly more than 700 tractors in the entire country. Dr. Jorge Pando Gutierrez, in his excellent study of the economic geography of Bolivia in 1947, recognized this national dilemma when he said:

> On the other hand, we must remember that as things now stand, the two million Indians who are occupied in agriculture are unable to satisfy the requirements of the million and a half remaining consumers and large quantities of food which Bolivia could produce have to be imported annually. . . . The Indian works from sunrise to sunset and is just able to produce enough for his own sustenance.[8]

All of the above logically leads to an inquiry as to the causes of this situation. Why, with ample land, labor, and a source of abundant foreign exchange with which to purchase capital goods, did this sector remain backward and stagnant? Again, many explanations are put forward, such as the lack of capital, the failure of labor to migrate, and the absence of credit and extension services. However, a closer examination

[6]United Nations Economic Commission for Latin America, The Economic Development of Bolivia: Summary and Extracts (E/CN 12/448, April 30, 1957) (New York, 1957), p. 10.

[7]Bolivia, Dirección General de Estadística y Censos, Revista Mensual, No. 62 (December, 1951), Table 70.

[8]Jorge Pando Gutierrez, Bolivia y el Mundo (La Paz, 1947) I, p. 39.

of these reasons invariably leads to the land tenure system, and the conclusion reached is that of the 1951 United Nations study on the developmental prospects of Bolivian agriculture:

> The real reason for the stagnation of agriculture and its retarding effect on Bolivia's economic development lies in the continuance of these forms of tenure of farm property and systems of work.[9]

Before outlining the salient features of the Bolivian latifundio land tenure system as it existed at the time of the M. N. R. revolution, a slight digression is warranted to sketch its historic evolution, a knowledge of which is indispensable to a complete comprehension of this system. Prior to the arrival of the Spaniards, the two indigenous races, the Aymara and the Quechua, had a highly organized civilization under the Incas and an agricultural technology which was not markedly inferior to that of the Western World. The land was communally held, distributed, and worked in three parts: one belonging to the Sun (religious lands), one to the Inca (state lands), and one to the community. The similarity of this organization to that existing in Spain at the time, where the land was held in large estates based upon the late Roman tenure pattern of the latifundia, led Harold Osborne to comment:

> It is a very remarkable thing that without direct contacts the development of the human race in the Old World and the New ran so remarkedly parallel in agricultural discoveries, inventions and techniques of craftsmanship and industry and even in social organization and religious and funerary practices.[10]

[9]United Nations, Economic Commission for Latin America, Development of Agriculture in Bolivia (E/CN 12/218 add 2, May 12, 1951) (Mexico City, 1951), p. 7.

[10]Harold Osborne, Indians of the Andes (London: Routledge and Kegan Paul Ltd., 1952), p. 8.

The conquest of the Inca civilization by Pizarro and the following Spanish colonization had an immediate impact upon the Indians of Bolivia in regard to their land. These colonies were exploitative of the labor, land, and precious metals. After Bolivia obtained her independence from Spanish rule, an 1866 decree abolished the Indian communities and the accumulation of land in the hands of a few individuals increased. This law was later repealed, but the encroachment upon the land of the Indians continued virtually up to the time of the 1952 revolution. Edmundo Flores, a renowned scholar of land reform, gives an excellent historic account of how in 1907 Taraco, a large Indian community bordering Lake Titicaca, was confiscated and converted into a hacienda by none other than the President of the Republic.[11] By 1950, the extent of this land concentration reached a very high degree. At the time of the 1950 agricultural census, 80% of the smallest farms constituted only 1% of the land, and 6% of the largest covered 92% of the land. In addition, only 2% of all this land was cultivated, with large portions of the remainder lying idle or unexploited. The census also gives the figures which show the inverse relationship of size of holding and area cultivated. Eighty percent of the smallest landholders cultivated 44% of their land and the largest estates, comprising 92% of all land, only cultivated 0.01% of their holdings. All of this is indicated in Table 5 below.

[11] Edmundo Flores, "Taraco: Monografía de un Latifundio del Altiplano Boliviano," Khana--Revista Municipal de Arte y Letras, IV (1955), 55-73.

TABLE 5

DISTRIBUTION OF AGRICULTURAL UNITS AND LAND BY SIZE OF UNIT: BOLIVIA, 1950

Size Group (in hectares)	Agricultural Units (number)	(percent)	Extension of Land (hectares in thousands)	(percent)
0 - 0.9	24,747	28.6	10.8	.03
1 - 4.9	26,451	30.6	63.0	.20
5 - 19.9	14,671	17.0	136.1	.42
20 - 49.9	4,832	5.6	143.4	.43
50 - 99.9	2,776	3.2	183.1	.56
100 - 499.9	4,732	5.5	1,051.2	3.21
500 - 999.9	1,539	1.8	1,049.3	3.20
1,000 - 2,449.9	2,139	2.5	3,290.0	10.05
2,500 - 4,999.9	1,861	2.2	5,433.9	16.59
5,000 - 9,999.9	797	.9	5,146.3	15.71
Over 10,000	615	.7	16,234.0	49.57
Not reported	1,217	1.4	8.7	.03
Total	86,377	100.0	32,749.8	100.00

Source: Bolivia, Oficina Nacional de Estadística y Censos, Censo Nacional Agropecuario de 1950 (La Paz, 1950).

However, this table does not truly reflect the distribution of ownership since many individuals and families owned as many as 25 or more agricultural units. The table also includes indigenous communities, but their importance as well as that of the small peasant farms is very minor. Their relative insignificance as compared with the dominance of the latifundio land tenure method of cultivation is illustrated below:

TABLE 6

METHODS OF LAND CULTIVATION (in percentages)

Semifeudal cultivation (latifundios)	90.54
Property worked by owners	1.50
Properties worked with the aid of wage-earners, etc.	2.44
Rented properties	2.66
Properties of Indian communities	2.86

Source: Bolivia, Decreto Ley de la Reforma Agraria, No. 03464 (La Paz, 1953), pp. 6-7.

All these statistics, however, do not reveal more than the fact that agriculture in Bolivia was dominated by large landed estates known as latifundios. But these estates--no eran solo unos negocios--were not only businesses. Nowhere is this more evident than in the tenancy arrangement. Below is a typical list of the customary rights and obligations of the hacendado (landowner) and the colonos (Indian laborers) under the Bolivian Latifundio land tenure system:

Obligations of the Hacendado

1. To provide each colono with a tract of cultivable land called a sayaña from which he is entitled to all production, and upon which he can build his own house out of such materials as are at his disposal. This sayaña includes the piece of land upon which he has built his house and a composite of fragmented parcels in various ainokas. The ainokas are tracts of land devoted to a particular crop each year and rotated so that one year it is planted to potatoes, the next barley, etc.

2. To allow the colono certain rights to pasture his livestock on hacienda land which is not being used for crops or reserved exclusively for the grazing of the hacendado livestock.

3. To grant the colono certain rights to irrigation water which is not being used on the lands exclusively reserved for the hacendado.

4. To furnish the colono with coca and occasionally a noonday meal during periods of heavy labor such as seeding, harvesting, etc. It was often customary to provide the campesino with alcohol for the festivities that usually followed such occasions as a successful harvest.

Obligations of the Colonos

1. To devote three days of each week (usually Monday, Tuesday, and Wednesday), on the lands or properties of the hacendado. During the cropping seasons the colono worked the required number of days to complete the task which very often exceeded the three day per week customary obligation.[12]

2. Furnish his own tools, oxen, burros, and other family members to prepare, seed, and harvest the crops of the hacendado and carry the produce to market or the townhouse.

3. Assume certain responsibilities for the care of the hacendado livestock, land, and buildings.

4. To periodically prepare the products of the hacienda such as cheese, dehydrated potatoes (tunta and chuño), etc.

5. To provide certain personal services to the hacendado and administrator at both the estate and the townhouse. These included

[12]The rights and obligations varied among colonos within a hacienda. If a colono was a cuatro persona (fourth of a person), he was obliged to render three days of labor services per week to the hacendado in return for the use of a small tract of land. However, if he was a media persona (half of a person), he was required to provide the landowner with twice as much labor for the use of twice as much land. Finally, if he was a persona (full person), he and his family gave the hacendado twelve labor days of service each week for the use of four times as much land as a cuatro persona.

kitchen duties, collecting fuel, running errands, etc.[13]

This completes the outline of the pre-reform Bolivian economy. The inescapable inference which is drawn from this analysis is that the latifundio land tenure system largely explains the existence of the traditional agrarian sector. This stagnant and backward agriculture impeded or arrested any growth impetus originating in the non-agricultural sector. United Nations experts, Bolivians, and others have long considered the latifundio to be an obstacle to economic justice, efficiency, and growth. Included in this group is the Movimiento Nacionalista Revolucionario, the political party responsible for the 1952 revolution and the concomitant land reform. This party, its revolution, philosophy, and land reform will now be outlined.

B. The Bolivian Revolution of 1952

This combination of an increasing urban population, unstable foreign exchange earnings, and inefficient and stagnant agriculture gave rise to budget, balance of payments, financial and economic crises, all of which culminated in the various political upheavals the nation has experienced in its recent history. For example, there were seven presidents and eight revolutions between 1941 and 1952. These revolutions were classic coups d'état and the various governments were controlled by what was referred to as "the Rosca", a term including the landed plutocracy, mining companies, and others. Bolivia was a constitutional democracy during this period; however, only Spanish-speaking individuals

[13]Bolivia; Ministerio de Agricultura, Ganadera y Colonización, Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes del Departamento de La Paz (La Paz, 1946), pp. 24-26 and 85-86.

who earned an income of 200 Bolivianos or more per annum, roughly 200,000 people, were eligible to vote.

In 1951 this small number of politically franchised citizens cast more votes for the Movimiento Nacionalista Revolucionario, a relatively new "middle-class" reform party, than for any other political party. However, due to the apparent failure of this party to muster an absolute majority of the votes, it was not permitted to form a government. The existing constitution provided that Congress should elect the President in the event that no candidate received an absolute majority of the votes. However, shortly after the election and before the Congress could act, a Military Junta was formed, which declared the election invalid and proceeded to govern. The M. N. R. reacted by forming a coalition with the embryonic organized labor movement. On April 11, 1952--after three days of street fighting in the capital city of La Paz--the coalition, in a conspiracy with the National Military Police, seized power.[14] This in itself would not be of great interest were it not for the fact that this coalition came into power committed to the nationalization of the mines, the emancipation of the Indian, and other social and economic reforms. The changes this revolution wrought were greater than those of the Revolution of Independence, and possibly than those of the Spanish Conquest. It attempted to remake the economic, social, and political structure of Bolivia. On July 21, 1952, the M. N. R. government decreed universal adult suffrage for all citizens. On October 31, 1952, it nationalized the large Patiño, Hochschild, and Aramayo mines,

[14] The three great leaders of this party and its revolution were Victor Paz Estenssoro, the leader of the party; Hernán Siles, a party member and leader of the armed revolt; and Juan Lechín, head of the organized labor coalition fraction.

which together accounted for 75-80% of all tin exports and a considerable number of other mineral exports at the time. It also carried out various labor and social legislation in education, health, etc. However, for purposes of this study and in many other ways, the most significant reform was the abolishment of the latifundios and the redistribution of the land to the colonos.

C. The Bolivian Land Reform of 1953

Immediately after the revolution, the new government established the Ministerio de Asuntos Campesinos, and began organizing the colonos into unions. A few months later it established a commission to study the agricultural situation and to submit a land reform proposal to the government within ninety days. After a brief public discussion, the Decreto de la Reforma Agraria was enacted into law on August 2, 1953. Robert Alexander, an unabashed admirer of the revolution, had this to say on the importance of this far reaching and irreversible reform:

> Agrarian reform is the cornerstone of the National Revolution. Social justice demanded it. Economic development was impossible without it. Advance toward a democratic society was inconceivable until it had been accomplished. Bolivia would not truly be a modern nation until agrarian reform had been achieved.[15]

1. The Official Land Reform

All land reform programs are revolutionary and that of Bolivia more than most others since it was enacted into law and put into practice during a period of unprecedented change. Consequently, there are in fact two land reform laws and two land reform programs. There is, first of

[15] Robert J. Alexander, The Bolivian National Revolution (New Brunswick, Rutgers University Press, 1958), p. 57.

all, the legal statute and the governmental program of land redistribution. Secondly, there is the revolutionary extra-legal redistribution of the land by the peasants themselves. To understand the effect of this upon the law, it is necessary to first outline the salient features of the statute. The six fundamental objectives of the agrarian reform as given in the preamble to the law are these:

1. To allot cultivable land to the peasants who do not have it or have very little, with the condition that they work it; expropriating to this end those lands which inefficient landlords hold in excess, or from which they enjoy absolute rents not earned by their own personal labor in the field.

2. To restore to the indigenous communities the lands which were usurped from them, and to cooperate in the modernization of their agriculture, respecting and making use of their collective traditions insofar as possible.

3. To free agricultural laborers from their condition as serfs, proscribing gratuitous personal services and obligations.

4. To stimulate greater productivity and commercialization of the agricultural industry, facilitating the investment of new capital, respecting the small and medium farmers, developing agrarian cooperativism, lending technical aid, and opening possibilities for credit.

5. To conserve the natural resources of the nation, adopting technical and scientific methods which are indispensable.

6. To promote currents of internal migration of the rural population, now excessively concentrated in the Inter-Andean region, with the objective of obtaining a more rational human distribution, of strengthening national unity, and of integrating the Eastern area of the

Bolivian territory with the Western.[16]

As will soon become evident, the most important features of the law are those which deal with the redistribution of the land.

Article 1 states that the soil, sub-soil, and w. ers of the nation originally belong to the State.

Article 2 guarantees private property when it fulfills a "social function," and commits the State to the support of an "equitable" distribution of the land.

Article 8 defines a "medium property" as one larger than a small property which uses wage labor and modern methods of production and produces for the market.

Article 12 first defines a latifundio as being of varying size, its land underutilized, using antiquated technology and little capital, and holding the Indian laborers in a state of serfdom. It then stipulates that this agricultural unit is "not recognized by the State."

Article 34 stipulates that its entire land extension is to be affected.

Articles 36 and 37 exempt "agricultural enterprises"--defined as those large estates using modern technology, large investments in capital equipment, and paid labor--from expropriation exceeding one-third of its land extension.

Article 156 requires that this expropriation be accompanied by monetary compensation in the form of twenty-five year agrarian bonds at two percent.[17]

[16]Bolivia, Decreto Ley de la Reforma Agraria, No. 03464 (La Paz, 1953), pp. 9-10.

[17]Ibid., passim.

Indigenous communities, cooperatives, and small peasant farms were to be created and expanded by the redistribution of all the land of the latifundios and portions of "medium farms" and "agricultural enterprises."[18] Expropriated landlords were to be compensated by the new beneficiaries of the reform, i. e., their former colonos now referred to as campesinos.

The importance of these articles is seen in the kinds and types of programs the government undertook to achieve these objectives. Virtually the only program put into practice was one exclusively occupied with the redistribution of the land. Immediately after the inactment of the law, the government set in motion a program to expropriate the latifundios

[18]The law proposed to do away with the large landowners and create the following forms of private property. The maximum size of these properties was to be determined by ecological zones dividing the nation and the system of work employed in the exploitation of the land. The breakdown is given below:

1. Small property: (Article 15)
   a. In the high Andean zone, between 10 and 35 hectares
   b. In the valley zone, between 3 and 20 hectares
   c. In the sub-tropical zone, between 10 and 80 hectares

2. Medium property: (Article 16)
   a. In the high Andean zone, from 80 to 350 hectares
   b. In the valley zone, from 24 to 150 hectares
   c. In the sub-tropical zone, from 150 to 600 hectares
   d. In the tropical zone to 500 hectares

3. Agricultural enterprises: (Article 17)
   a. In the high Andean zone, from 400 to 800 hectares
   b. In the valley zone, from 80 to 500 hectares
   c. In the sub-tropical zone, from 500 to 2,000 hectares
   d. In the tropical zone, from 500 to 2,000 hectares

4. Livestock ranch property in the sub-tropical and tropical zone: (Article 21)
   a. Small 500 hectares
   b. Medium 2,500 hectares
   c. Large up to 50,000 hectares

Small and medium properties of the extension prescribed by the law which existed prior to the land reform were not to be affected. The law granted the right to obtain land to all Bolivian citizens of eighteen years of age or older, preference given to peasants actually working the land. Ibid.

and redistribute the land to the former agricultural laborers. The Servicio Nacional de la Reforma Agraria was set up and agrarian boards, some of them mobile, were created to survey and divide this land. As of January 1, 1966, substantial progress had been achieved as indicated in Table 7 below:

TABLE 7

NUMBER OF LEGAL LAND REDISTRIBUTION CASES, TITLES DISTRIBUTED, FAMILIES BENEFITED, AND HECTARES DISTRIBUTED: BOLIVIA, JANUARY 1, 1966

Year	Legal Redistribution Cases	Titles Distributed	Family Heads Benefited	Hectares Distributed	Hectares Reverted to the State
1953	-	-	-	-	-
1954	-	-	-	-	-
1955	32	3,400	2,809	51,811	-
1956	75	4,463	3,863	46,604	579
1957	281	11,400	8,028	276,293	103
1958	216	9,193	5,709	201,631	367
1959	313	18,380	12,097	316,462	4,040
1960	904	38,897	22,410	825,871	26,899
1961	1,186	45,511	28,210	1,129,442	38,379
1962	1,880	50,227	28,843	1,255,791	24,950
1963	1,185	47,461	40,641	1,271,686	91,905
1964	626	18,317	11,295	531,946	33,497
1965	202	15,600	9,652	365,042	23,241
1966 Jan. 1	8	290	167	6,224	219
Total as of Jan. 1, 1966	6,908	263,139	173,724	6,278,803	244,179

Source: Bolivia, Departamento de Estadística, Servicio Nacional Reforma Agraria (February 8, 1966). Provided by Department Head, Sr. Hector Mercado Negrete. (Unpublished.)

However, due to the confusion and uncertainty which followed the revolution, many delays were encountered. This was, in large measure, attributable to the Bolivian obsession with legality. For example, an

expropriated hacendado could legally object to the work of the topographers, protest the decree of the local agrarian board, appeal to the Servicio Nacional de la Reforma Agraria, and as a last resort appeal directly to the President of the Republic. Consequently, it often took as many as four to six years to settle a case under these rules. The only other program the government attempted was the creation of campesino cooperatives. While there are no reliable statistics on the number of cooperatives, it appears that there are a few which are functioning. These programs have had a degree of success in eliminating latifundios, creating small peasant farms, and establishing campesino unions and a few cooperatives. They have also returned to the communities a portion of their lost land. This is the Bolivian land reform and program which will be referred to as the official land reform.

2. The True Land Reform

The true land reform law and program are these official ones as modified by the revolutionary activities of the campesinos. In the midst of the revolutionary changes taking place throughout Bolivia during 1952-1953 and shortly thereafter, the campesinos, who were organized into sindicatos (unions), found themselves in control of the countryside. They were impatient or unwilling to await the arrival of the agrarian boards and seized many of the large, medium-sized, and small estates. Not only the latifundios, but also "agricultural enterprises" and others not destined by law for expropriation were confiscated. These lands were then divided by the campesinos, and the government was faced with

de facto redistribution.[19] In short, this land reform, enacted into law and put into action during a period of revolution, had the effect of radically changing the Bolivian agrarian reform into something distinct from that envisioned by its creators as expressed in the letter of the law. The true Bolivian land reform as defined in this paper is that which exists. It is not the legislation or governmental programs apart from the revolutionary changes which have influenced and modified them. Land reform in Bolivia was the destruction of the latifundio land tenure system and the creation of numerous small campesino family-owned and operated farms. This redistribution of land was accomplished with virtually no compensation to the former landowners, and is therefore also an income redistribution. Other than that related to land redistribution, no governmental program of any significance, such as agricultural extension or credit, have been attempted on a national scale. Victor Paz Estenssoro, President of the country and leader of the M. N. R., in these few words spoken at the ninth convention of the party in 1964, expressed the sum and substance of the reform:

> We made the agrarian reform. We took the land from the unproductive and absentee landowners, and we have given it to the campesinos who worked it. 'The land belongs to those who work it,' is our philosophy and our justification.[20]

[19] This was particularly true of the Cochabamba Valley where these seizures, according to Richard Patch, took place even before the law was enacted. To the knowledge of this writer, this illegal confiscation was less widespread in the Altiplano region and did not begin until after the legal redistribution of land was inaugurated. In the lesser populated areas of the country like the Yungas, such activity on the part of the campesinos was apparently very rare. See Richard W. Patch, "Bolivia: U. S. Assistance in a Revolutionary Setting," in Council on Foreign Relations, Social Change in Latin America Today (New York: Harper and Brothers, 1960), pp. 108-176.

[20] Victor Paz Estenssoro, La Revolución Boliviana (La Paz, 1964), p. 19.

The next two chapters of this paper will analyze the economic and socio-economic consequences of this true Bolivian land reform by means of a comparative study of Peruvian haciendas and Bolivian ex-haciendas in the Lake Titicaca region.

IV. THE LAKE TITICACA REGION

To begin with, two questions warrant answers. First of all, why compare Peruvian haciendas with Bolivian ex-haciendas? Secondly, why choose the Altiplano agricultural region for study? Comparing a few Peruvian haciendas and Bolivian ex-haciendas in the Lake Titicaca region appears to be a rather circuitous method in a restricted area for a critical examination of the Bolivian land reform. Typically, one would compare present agricultural production and productivity at the national level with that which existed prior to land reform, and compare the present economic performance of Bolivian ex-haciendas with the pre-reform Bolivian haciendas. However, this was not possible for a number of reasons. The most important is the absence of reliable comparative data. The quantity and quality of a country's national economic accounts largely depends upon her national income, and Bolivia has not had the technicians, money, or inclination to undertake many such activities--the 1950 agricultural and population surveys notwithstanding. In addition, the few existing studies of Bolivian haciendas and ex-haciendas were undertaken by different people from various disciplines for dissimilar reasons. For these and other reasons elaborated upon below, Peruvian haciendas and Bolivian ex-haciendas were investigated in the Lake Titicaca region and evidence was accumulated illuminating many differences between these two land tenure systems. In addition, as will be explained below, the particular methods chosen and the uniqueness of the region chosen often permit the use of the Peruvian haciendas as proxies, albeit imperfect ones, for the now extinct Bolivian haciendas. Official agricultural data and studies on Bolivian haciendas and ex-haciendas were, however, a most valuable source of supplementary material.

A. The Andean Altiplano

The Altiplano is the sedentary agricultural and livestock ranching area selected for field research because of a number of special characteristics. It is the agricultural region where the latifundio land tenure system had its greatest influence upon the lives of a majority of the nation's campesinos. Besides providing these campesinos with subsistence, it is also a major source of food for La Paz, the largest city in Bolivia. It is one of the agricultural areas where land reform had its greatest impact. As nearly as can be determined, every large estate and innumerable smaller ones have in one way or another been affected. But most important for purposes of this study is the fact that the Altiplano extends into Peru and contains the Lake Titicaca region which provides the opportunity to use Peruvian haciendas for a comparative analysis.

1. Topography

Before proceeding to a discussion of the Lake Titicaca region, the more extensive Altiplano, its topography, climate, flora and fauna, and its agricultural products will be discussed because of the importance of these features to a complete comprehension of the area and above all of this study. The Altiplano is the high plain which begins at the knot of Vilcanota in Puno, Peru, and extends southwest between the Cordillera Occidental and Cordillera Real of the Andean Mountain Range.[1] This is an intramontane chasm filled during the glacial and interglacial periods by red sandstone, clay, conglomerates, and volcanic ash brought down from the surrounding mountain peaks. The

[1]Nearly four-fifths of the Altiplano's total area of approximately 50,000 square miles lies within Bolivia. This high plain is between 80 and 100 miles across and has an approximate maximum length of 520 miles.

average altitude of the Cordillera Occidental is 16,500 feet above sea level, the average altitude of the Cordillera Real is 18,000 feet above sea level, and the Altiplano altitude varies between 12,500 and 13,500 feet above sea level. In the northeastern corner of this plain on the border of Peru and Bolivia lies Lake Titicaca. This lake is probably the highest navigated lake in the world with a surface altitude of approximately 12,500 feet above sea level.[2]

2. Climate

As Table 8 below indicates, temperature, rainfall, and therefore soil productivity vary depending upon proximity to Lake Titicaca and shelter from the winds and frosts of the Altiplano:

TABLE 8

VARIATIONS IN TEMPERATURE AND PRECIPITATION ON THE ALTIPLANO

Locations	Range of Average Annual Temperature	Range of Average Annual Precipitation
Lake Shore	48° to 51° F.	25 to 35 inches
Sheltered Areas	45° to 51° F.	20 to 35 inches
High Open Plains	43° to 49° F.	15 to 20 inches

Source: Information taken from Bolivia, Banco Agrícola, Explotación Ovina del Altiplano (La Paz, 1963), pp. 11-18, and Peru, ONERN y CORPUNO, Programa de Inventario y Evaluación de los Recursos Naturales del Departamento de Puno (Lima, 1965) V. Chapter 7, pp. 115-116.

[2]Lake Titicaca is 138 miles long and 70 miles wide at its extremities with a maximum depth of 1,500 feet. Among other distinctions, this lake is one of the reputed mythical origins of the Incas.

Neither the temperature nor the precipitation is uniform. There is great temperature variation within a 24 hour period, with sunny, pleasant days, but night temperatures often fall below freezing during the dry season. However, the temperature remains quite constant from day to day throughout the year. There is a great variation in the rainfall with the heaviest precipitation from November through February, with very little rain during the rest of the year. Hail storms, floods, droughts, wind, frost, etc., are typical on the Altiplano.

3. Flora and Fauna

Aside from scattered parcels of land on the shores of the lake, the soil is not fertile or otherwise ideally suited to cultivation. The land of the Altiplano, although level and covered with dense vegetation, is chemically poor in phosphorus, nitrogen, and organic matter. The soil has high water absorbtion capacity, and the loose spongy surface is highly susceptible to erosion. Nevertheless, a wide variety of flora and fauna exist. Natural grasses and plants of the genuses trefoil, geranium, gentian, verbena, etc. are abundant. There is an abundance of paja brava, a coarse brown grass a foot to eighteen inches high, eaten by the animals native to the region but also used in the construction of the campesino houses, especially the roofs. Llareta bushes are shrubs used by the campesinos for building and fuel. The tatora is a water weed which is found along the lake edges and is used by the campesinos in the construction of their balsa boats, their houses, etc. It is also a very nourishing fodder, which is harvested and fed to the livestock prior to marketing. Trees are very scarce. A stunted variety known as kenua is the only one native to the region; however, eucalyptus and evergreens have been imported and successfully cultivated in a number of

sheltered areas near Lake Titicaca.

4. Food Crops and Domesticated Animals

The climate, soil, and altitude restrict the type of crops which can be grown on the Altiplano. Potatoes and oca are the two most important tuberculars grown in the area.[3] Quinua and cañahua are two native plants, the former a type of millet and the latter a dark grain. Barley is also cultivated extensively for both grain and fodder. Habas is a type of broad bean which is cultivated, along with small quantities of onions, carrots, wheat, etc., in a very few sheltered locations on the shores of the lake.

The domesticated animals include species native to the area and imported varieties. The llama is the most important indigenous species whose wool, meat, and carrier services are a mainstay of the campesinos. The alpaca, whose wool is more profuse than the llama's and in greater international demand, is less common. The third member of this species, the vicuña, is undomesticated and nearly extinct. Sheep and cattle, which were introduced by the Spanish, are predominately of the degenerate criollo-type except in a number of haciendas where a slow process of improving the strain is being carried out. On these landed estates, the dominate type is a mixed or cross-breed between the criollo and imported improved stock. The horse, mule, and burro are used for transportation with the burro being most numerous; again, all three are of very poor criollo stock. Only one other animal merits attention and this is the

[3] The campesinos usually dehydrate these roots by first soaking them in water for a week and then exposing them to the sun and night frost for ten days. Afterwards, they are trodden to eliminate the moisture and again exposed to the sun and frost for another three to four weeks. The final dehydrated potato is referred to as chuño or tunta, depending on the variety of potato.

"mountain chicken" or cuyo, a type of guinea pig which is domesticated and whose meat is considered a delicacy by campesinos and city dwellers alike.

B. Study Area--The Lake Titicaca Region

The Lake Titicaca region, as defined in this study, is composed of the Altiplano portions of the Department of Puno, Peru, and the Department of La Paz, Bolivia.[4] Not only is this area topographically homogeneous, but prior to 1953 the culture, the economy and, above all, the latifundio land tenure system of the Bolivian sector were nearly identical to those of the Peruvian sector. Despite the existence of a Peruvian land reform law, the latifundio land tenure system still exists in the Department of Puno. The simultaneous existence of Peruvian haciendas on one side of the border lake and recently created campesino owner-operated farms (the Bolivian ex-haciendas) on the other side afforded a remarkable opportunity for comparative study. Because the latifundio land tenure systems on both sides of the border were quite similar prior to 1953, and because the Peruvian latifundio land tenure system is anything but dynamic, the Peruvian haciendas serve as imperfect proxies for the nonexistent Bolivian haciendas. This situation provides an example of the well-known cross sectional approach.

[4] This region is composed of those provinces of the Departments of La Paz, Bolivia, and Puno, Peru, influenced by Lake Titicaca. They include the Provinces of Camacho, Omasuyos, Los Andes, Ingavi, Manco Kapac, and parts of others in Bolivia, and portions of Puno, Azangaro, Lampa, San Roman, and Chucuito in Peru. See map on page 42.

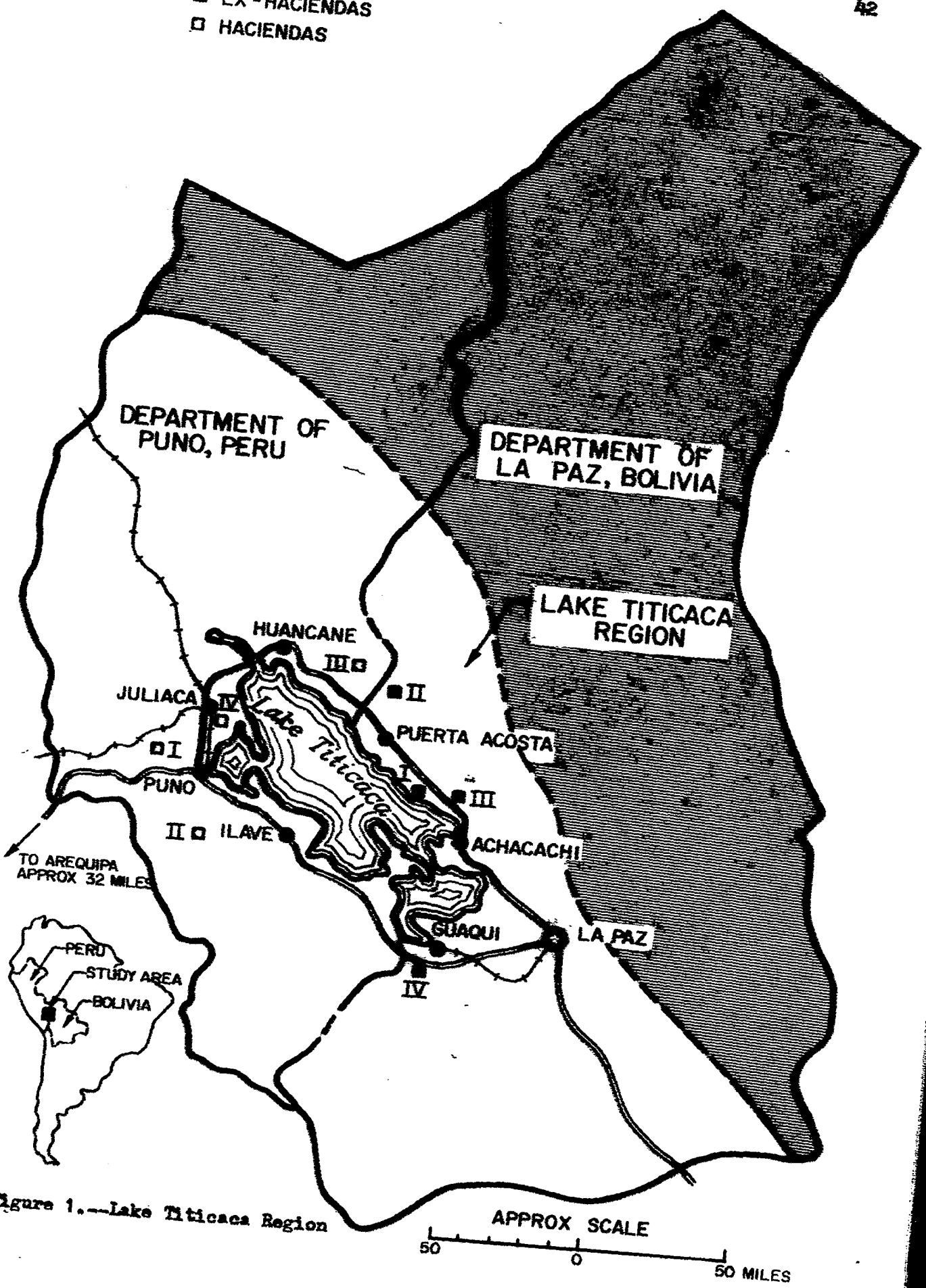


Figure 1.--Lake Titicaca Region

1. The Peruvian Latifundio Land Tenure System in Puno, Peru

The similarity of the present Peruvian latifundio land tenure system to that which existed in Bolivia prior to the land reform is striking. For example, in the Department of Puno 80% of the smallest agricultural units have possession of 3.2% of the land and at the other extreme 0.2% of the largest have 60% of the land at their disposal.[5] The inverse relationship between size of farm and area cultivated also exists. Approximately 90% of the large estates are absentee owned and managed by administrators. The tenancy relationships between the landlords and Indian agricultural laborers are similar except for the modifications discussed below. Eighty percent of the population is engaged in agriculture which is stagnant and of comparable low productivity. Many of these similarities as well as dissimilarities will be elaborated upon throughout this paper.[6] These facts and figures do, however, lend credence to the use of these Peruvian haciendas as proxies for the nonexistent Bolivian haciendas.

2. Peruvian Haciendas as Imperfect Proxies for Bolivian Haciendas

It should be emphasized, however, that they only serve as imperfect proxies. While there are a substantial number of similar characteristics, there are also a few notable differences. First of all, the Bolivian revolution and land reform had certain repercussions in Peru and especially in the Department of Puno. An embryonic and not altogether

[5]From the Censo Agropecuario de 1961 as cited in Peru, ONERN y CORPUNO, Programa de Inventario y Evaluación de los Recursos Naturales del Departamento de Puno (Lima, 1965), V. Chapter 7, p. 103.

[6]For comparative data of the pre-reform Bolivian agricultural situation, see above, pp. 18-24.

independent campesino[7] labor union has emerged. The Frente Sindical de Trabajadores y Campesinos del Departamento de Puno has 1,200 locals, many of which are located within the haciendas. Their primary function is to force the hacendados to comply with new social legislation such as the minimum wage presidential decree of 1964.[8] This law requires that all campesino laborers (male and female) be paid a daily wage of 12 to 15 soles and salaried employees 360 to 450 soles monthly. Although most sindicatos are unable to force the landowners to pay this minimum wage, its very existence has brought about changes in the resource mix within the haciendas since labor is no longer a free resource. Most important of all is the newly enacted but not fully operative Ley de Reforma Agraria No. 15037 of November 25, 1964, and the Supreme Decree No. 18 of May 21, 1965, which formally designated the Department of Puno as an agrarian reform zone.[9] The law stipulates that haciendas exceeding the average productivity of the department, possessing substantial capital equipment, and paying their employees could retain a maximum of 8,000 hectares or a minimum of 3,000 hectares.[10] Desirous of holding onto as much land as possible, many haciendas during the period under observation were investing in capital equipment and livestock as well as paying their

[7] In addition to campesinos, the Indian laborers of the Peruvian haciendas are also referred to as colonos, indios, and pastores. To avoid confusion, these hacienda laborers will be called campesinos throughout this paper.

[8] Peru, Resolución Suprema No. 14 (Lima, January 17, 1964).

[9] The only other area in the country of any significance to be declared a land reform zone as of January 1966 was the Department of Cuzco, the other large Indian populated area.

[10] This information was obtained from conversation with various Agrarian Reform officials and U.S.A.I.D. personnel in Puno, the capital city of the department.

employees a money wage. All of this has substantially modified the Peruvian latifundio land tenure system. The Peruvian haciendas would presumably have been better proxies for the expropriated Bolivian haciendas in the Region prior to the 1964 Peruvian minimum wage and land reform decrees. In an attempt to approximate the pre-reform sector of the Lake Titicaca region, one might quite realistically ignore virtually all of the cash income of the Peruvian Indian laborers, most of the newly acquired farm equipment, and even much of the international wool sales of the Peruvian haciendas.

It should also be pointed out that there are a number of other factors which account for differences between the present Peruvian haciendas and the extinct Bolivian haciendas. More significant is the different location of the consumer markets. The principal market for the Bolivian sector of the Lake Titicaca region is the capital city of La Paz, which borders the region and is readily accessible. On the Peruvian side of the border the nearest large consumer market is Arequipa, which itself lies in a very fertile and productive valley.[11] Thus the Bolivian haciendas had a ready market for bulky low cost products such as potatoes, chuño, ocas, etc. In contrast, the lack of a similar accessible consumer market for the Peruvian haciendas give rise to transportation costs which prohibit great quantities of such exports and force the Peruvian haciendas to produce high-value, low-weight products such as meat for internal consumption and wool for international export. Since livestock ranching requires less labor per unit of land, the population density was somewhat less in the Peruvian sector than in the Bolivian. However, it is extremely difficult to weight the importance of this difference in market proximity.

[11] See map on page 42 for the location of markets and transportation facilities.

The important point is that the Lake Titicaca region is unique inasmuch as it is probably the only area in the world where haciendas and ex-haciendas exist side by side in a relatively homogeneous site. As such it provides an excellent opportunity to conduct an historic as well as a present comparative socio-economic study of the consequences of the Bolivian land reform.

V. STATISTICAL METHOD OF RESEARCH

All who have concerned themselves with the issue of land reform are appalled by the existence of an informational vacuum combined with so much rhetoric at the expense of systematic quantitative research. "No decisive evidence is available about the differences between tenure groups in efficiency; yields, crop combinations, conservation, etc.," according to Don Kanel.[1] In addition, there are "no very satisfactory studies about the effect of land reform programs on production."[2] Indeed, considering the important role that the latifundio land tenure system has played in many Latin American countries, it has been grossly understudied. Only a few sociologists and anthropologists have seen fit to direct their scholarly efforts toward this field and economists, until very recently, have largely neglected the subject. However, there has been a recent awakening of interest as evidenced by such institutions as the Wisconsin Land Tenure Center and the number of competent economists presently engaged in land reform research. For these reasons, quantitative economic analysis is the predominate approach taken in this study. Factors, which do not easily lend themselves to quantitative analysis or the questionnaire technique are not ignored, only de-emphasized.

A greater emphasis has been placed upon an examination of the technical aspect of land reform than of the institutional. At the level of the firm, this study focuses on the issue of efficiency and farm size.

[1] Don Kanel, Project: Description of Existing Land Tenure Systems, and Impact of Economic Development and Population Growth on the Tenure System in Selected Situations in Latin America (Land Tenure Center, University of Wisconsin, May, 1964), p. 5. (Mimeographed.)

[2] Letter from Don Kanel of the Land Tenure Center at the University of Wisconsin, August 19, 1964.

As previously pointed out in this paper, this is the most controversial feature of land reform and fortunately the most easily quantified. The effect of the Bolivian land reform upon the campesinos was also examined in depth since it is here that the reform has had its greatest impact. In order to give direction to this analysis, it was conducted with the purpose of evaluating the Bolivian land reform on the basis of its stated objectives of increasing economic justice, efficiency, and development. Did the destruction of the latifundio land tenure system, resulting in the freeing of the campesino laborers and the redistribution of land (income), lead to a higher standard of living for the campesinos and their integration into the market economy? Also, did this creation of small peasant farms result in greater agricultural production and productivity? Were labor and final product markets created? Have the pre-conditions for development been set in motion? What, in short, has been the cost and benefit of the Bolivian land reform? Answers to these and other questions will be attempted in this paper based primarily upon a critical investigation of haciendas and ex-haciendas in the Lake Titicaca region.

A. Selective Sample of Peruvian Haciendas

A selective sample of four Peruvian haciendas and four Bolivian ex-haciendas was chosen for examination and comparison at the firm level. The field study was first carried out in the Peruvian sector of the Lake Titicaca region during the months of October, November, and December of 1965. The four Peruvian haciendas were selected from a list provided by the National Agrarian Reform Office of all large landed

estates in the region.[3] This same governmental agency conducted a sample study of these estates and found 87% of them to be "abandoned" or "inefficient."[4] From this population, four typical haciendas were selected for investigation which were absentee owned, livestock-grain enterprises, representative in size, production, productivity, etc. Locational dispersion was achieved by picking the haciendas to be studied from four different locations within the Lake Titicaca region.[5]

Because a hacienda is dichotomized into that portion of the estate which is utilized by and for the hacendado and managed by an administrator and that which is used by the campesinos for their subsistence, two different questionnaires were needed.[6] The formidable problems encountered, such as access, measurement, and above all language, necessitated the services of an assistant. Señor Luis Nuñez Geldres of the city of Puno, Peru, served as interpreter, interviewer, and general assistant throughout the field study. He had been an administrator of a hacienda for approximately twenty years, knowledgeable in the functioning of an Altiplano hacienda and well-known throughout the Department of Puno. Most important was his fluency in both Aymara and Quechua--the two

[3]This list of over 300 haciendas included nearly every large landed estate exceeding 2,000 hectares in the department. The median extension of land of this group was 4,850 hectares. Haciendas exceeding 10,000 hectares accounted for 50% of this total land area and consequently the median is a more meaningful central tendency statistic than the arithmetic mean.

[4]The criteria used in this evaluation were mechanization, productivity, quality of livestock, techniques of production, etc. While the words "abandoned" and "inefficient" are rather misleading, this study did provide a relative ranking of haciendas which enabled the selection of a number of characteristics typical of these large landed estates.

[5]See map on page 42 for location of the sampled haciendas.

[6]See Appendices A and B for an English translation of the questionnaires used.

native languages of the region.

Once the sample list had been obtained, the questionnaires drawn up, and the interpreter-interviewer selected, the procedure undertaken was as follows. First, permission was obtained from the owners, who lived in Lima, Arequipa, and Puno, to carry out an economic investigation of their respective haciendas. Next, each administrator was contacted and the requisite economic data obtained. The administrator was interviewed first, then the campesinos. All interviewing was conducted in the offices of the haciendas. Because of the small number of campesino employees, a rigorous effort was made to interview all of them. As Table 9 shows, this was very nearly achieved.

TABLE 9

PERUVIAN HACIENDAS RESEARCHED: LAND EXTENSION, NUMBER OF CAMPESINO EMPLOYEES, NUMBER AND PERCENTAGE OF CAMPESINOS INTERVIEWED

	Haciendas				
	I	II	III	IV	Total
Area in hectares of the hacienda	4,850	5,719	4,244	16,310	31,123
Total number of campesino employees	35	23	23	94	175
Number of campesino family-heads interviewed	34	23	22	88	167
Percentage of campesino employees interviewed	97	100	96	94	95

Without going into a detailed explanation of methods, it must be brought to the attention of the reader that every effort was made to obtain reliable information. The nature of the study, the local reaction to the latifundio land tenure system in general, and the habitual mistrust of those interviewed combined to create an atmosphere of suspicion. The hacendados and administrators are very suspicious of such studies, especially when they are conducted by foreigners. The campesinos are famous for, among other things, their aloofness, stoicism, and insincerity in their relations with blancos (whites).[7] Therefore, every effort was made to win the confidence of both parties. Letters of reference from every influential source, such as the Organization of American States, the hacendados, the campesino sindicatos, etc., were used. As a result, those interviewed were more cooperative once they were convinced of the seriousness and scientific nature of the investigation. The hacienda records of livestock, land, acreage cultivated, and production were used. In addition, hacienda accounts of the livestock and land cultivated by and for the campesinos were utilized. Finally, information provided by the National Agrarian Reform Office in Puno was used for cross-checking. In this manner was the economic analysis of the four Peruvian haciendas conducted and efforts made to secure accurate and reliable information.

[7]This stereotype, like all others, is an oversimplification and many exceptions can be found. In general, however, this was the attitude of most of the Peruvian campesinos interviewed. Their sad history and present status help explain such behavior. For example, in one of the haciendas studied, the landlord conducted a survey of the livestock owned by the campesinos and then proceeded to charge them a fee for every head of livestock grazing on hacienda land. In another the campesinos unwillingly signed their names to a legal document stating they had been paid when in fact they had not been paid. Their distrust is not without foundation.

B. Selective Sample of Bolivian Ex-Haciendas

Upon completion of this phase of the study, four Bolivian ex-haciendas on the other side of the border were selected for investigation. This research was conducted during the months of February, March, April, and May of 1966. The four ex-haciendas selected for investigation were once haciendas similar to those studied in Peru and typical of the ex-haciendas in the Lake Titicaca region of Bolivia. A search of the Agrarian Reform Office records in La Paz failed to uncover a comprehensive list of pre-reform haciendas or post-reform ex-haciendas for the region. However, previously-made studies of Bolivian haciendas and other available sources indicates that these haciendas were smaller in size than those presently existing in Peru. For example, a study of 28 haciendas exceeding 1,000 hectares in size, by the Bolivian Department of Agriculture, shows that their average size was 3,700 hectares.[8] In contrast, the haciendas in Puno, Peru, have an average area of 7,340.[9] Also a greater density of campesino families was found in the Bolivian sector of the Lake Titicaca region. Both these factors were taken into account in the selection of the ex-haciendas to be examined and the number of campesinos interviewed. After a visit to the archives of the Agrarian Reform Office and a week's tour of the area, four ex-haciendas were chosen for investigation. As nearly as can be ascertained, they were once similar to the four Peruvian haciendas to which they will be compared. That is to say, they

[8] Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, pp. 4-20.

[9] Based on the list of large landed estates provided by the Peruvian National Agrarian Reform Office. See p. 49, footnote 3.

were absentee owned, livestock-grain haciendas, representative in size, production, productivity, etc. An attempt was made to ensure comparability in nearness to market-roads and Lake Titicaca, as well as similarity in climate and terrain. The two notable differences, as mentioned above, were those of size and population density. The four ex-haciendas selected had a smaller total land extension. In addition, due to the large number of campesinos found on these ex-haciendas, a random sample was selected for interviewing. Like the haciendas, these expropriated landed estates can be separated into those portions farmed cooperatively and those farmed individually by the campesinos. In each ex-hacienda, a list of all campesinos was obtained from the sindicato and a random sample from this population was selected to be interviewed. Here, as in Peru, an assistant was needed. Señor Fernando Choque of Huarina, Bolivia, was the interpreter, interviewer, and invaluable assistant who served in this capacity. He himself is a campesino who was very active in the union movement and once served in the capacity of General Secretary of the Confederación Nacional de Trabajadores Campesinos de Bolivia. His various vocations include that of a small farmer, a missionary school teacher, and instructor for the United States sponsored Sindicalismo Libre program. His knowledge of the region, contacts in the union movement, and fluency in Aymara proved indispensable to the successful conduct of this phase of the study.

The procedure followed in Bolivia was slightly altered because of the different circumstances encountered. First, contact was made with the various sindicato leaders and a reunión (meeting) of campesinos arranged. In each case, the next step was for Señor Choque, armed with the indispensable personal letters of recommendation, to appear before

this assembly and explain the reasons for the investigation and plead for their cooperation. After a vote of approval from the popular assembly was obtained,[10] a random sample was selected, and the interviews begun. Approximately half of the interviews were carried out in the schools or sindicato offices and the other half conducted on the campesino small farms. Fortunately, although quite by chance, exactly the same number of campesinos were interviewed in Bolivia as in Peru, as seen in Table 10 below.

Here again every effort was made to ensure the reliability of information received. The opportunities for cross-checking were fewer than in the Peruvian situation, but fortunately the need for such procedures was not as great. The Bolivian campesinos, in general, were more receptive to questioning than were their Peruvian counterparts. These free landholding citizens have undergone a dramatic change of attitude in their relations with "outsiders" since the revolution and land reform. Studies of these same campesinos before 1953, when they were hacienda employees, reveal a behavior pattern identical to that of the Peruvian campesinos.[11] However, more will be said about this effect on the Bolivian land reform later. For the present, it need only be pointed out that in Bolivia efforts were also made to secure accurate

[10] Contrary to popular opinion and the findings of Mr. William E. Carter of the University of Florida, this writer did not find the general secretary of the sindicato to be "king" whose word is law. See Carter's Aymara Communities and the Bolivian Agrarian Reform, University of Florida Monograph #24 (Gainesville: University of Florida Press, Fall, 1964), p. 57.

[11] See Olen E. Leonard, Bolivia: Land, People and Institutions (Washington, D. C.: The Scarecrow Press, 1952), pp. 223-229; and Estudio Socio-Economico en las Provincias de Omasuyos, Ingavi y Los Andes, passim.

and trustworthy data. Agrarian reform records were used wherever possible for confirmation. Only those campesinos who were willing to divulge information were interviewed. In addition, the secretary general of the sindicato or some other respected individual was consulted to review all questionnaires.

TABLE 10

BOLIVIAN EX-HACIENDAS RESEARCHED: LAND EXTENSION, NUMBER OF CAMPESINOS FAMILIES, NUMBER AND PERCENTAGE OF CAMPESINOS INTERVIEWED

	Ex-Haciendas				
	I	II	III	IV	Total
Area in hectares of the ex-hacienda	5,591	2,348	1,518	5,221	14,678
Total number of campesino families	287	65	108	209	669
Number of campesino family-heads interviewed	68	30	48	21	167
Percentage of campesino family-heads interviewed	24	46	45	10	25
Total number of campesinos in cooperatives	140	-	108	-	248
Number of cooperative members interviewed	54	-	43	-	97
Percentage of cooperative members interviewed	38	-	40	-	39

Official agricultural statistics and studies of Bolivian haciendas and ex-haciendas will be used throughout this paper as supplementary sources of information. Information obtained about the Bolivian haciendas, as will be shown, confirms the validity of using Peruvian haciendas as proxies in many cases. Also, other studies of Bolivian ex-haciendas help to support the findings of the small selective sample taken.

VI. RELATIVE ECONOMIC EFFICIENCY OF THE PERUVIAN HACIENDAS AND BOLIVIAN EX-HACIENDAS

This chapter and the following one will analyze the Bolivian land reform in the Lake Titicaca region by comparing the Peruvian haciendas to the Bolivian ex-haciendas. The salient findings of this comparison will be supported by similar studies of haciendas and ex-haciendas in the Region. Finally, reference will be made to studies of pre-reform Bolivian haciendas in order to segregate those changes in the Bolivian sector occasioned by the transformation from a latifundio land tenure system to one of small peasant farms. In a later chapter, an attempt will be made to ascertain which of these findings can be extended to the remainder of the Bolivian nation.

Technical efficiency at the firm level is given first consideration because it is the most controversial issue in any discussion of the economic consequences of land reform. Are the Peruvian haciendas more efficient than the Bolivian peasant farms, or are the former mere agglomerations of the latter? What changes in efficiency, if any, have occurred in the agricultural units of production in the Bolivian sector as a result of the agrarian reform of 1953? Answers to these and other related questions will be attempted in this section. Many scholars have demonstrated that economic calculus has its limitations in analyzing the functioning of agricultural units in such traditional economies.[1] However, it is not necessary to assume rational economic behavior on the part of the campesinos or hacendados in order to investigate their economic performance.

[1] Alexander V. Chayanov, The Theory of Peasant Economy, ed. Daniel Thorner, et. al. (Homewood, Illinois: Richard D. Irwin, Inc., 1966), A. E. A., Translation Series.

A. Economic Resources

It is expedient to begin this analysis with an investigation into the stock of economic resources available in both sectors and modifications thereof attributable to the Bolivian land reform.

1. Labor and Population Densities

A most important factor in traditional agricultural economies is population in relation to land. While the Bolivian and Peruvian campesinos interviewed have many nearly identical population characteristics, the population densities on the haciendas and ex-haciendas are markedly different. An example of these characteristics is found

Figure 2.--Population (Age-Sex) Pyramid of Bolivian Campesinos Interviewed

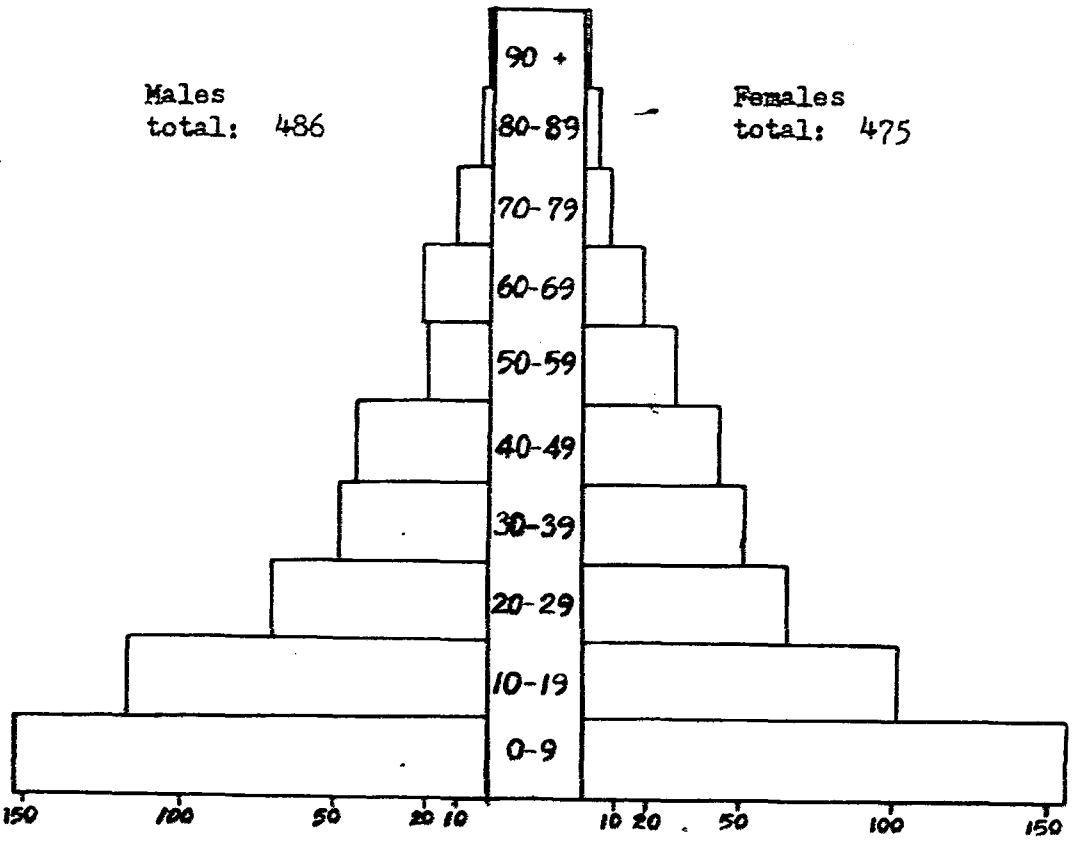
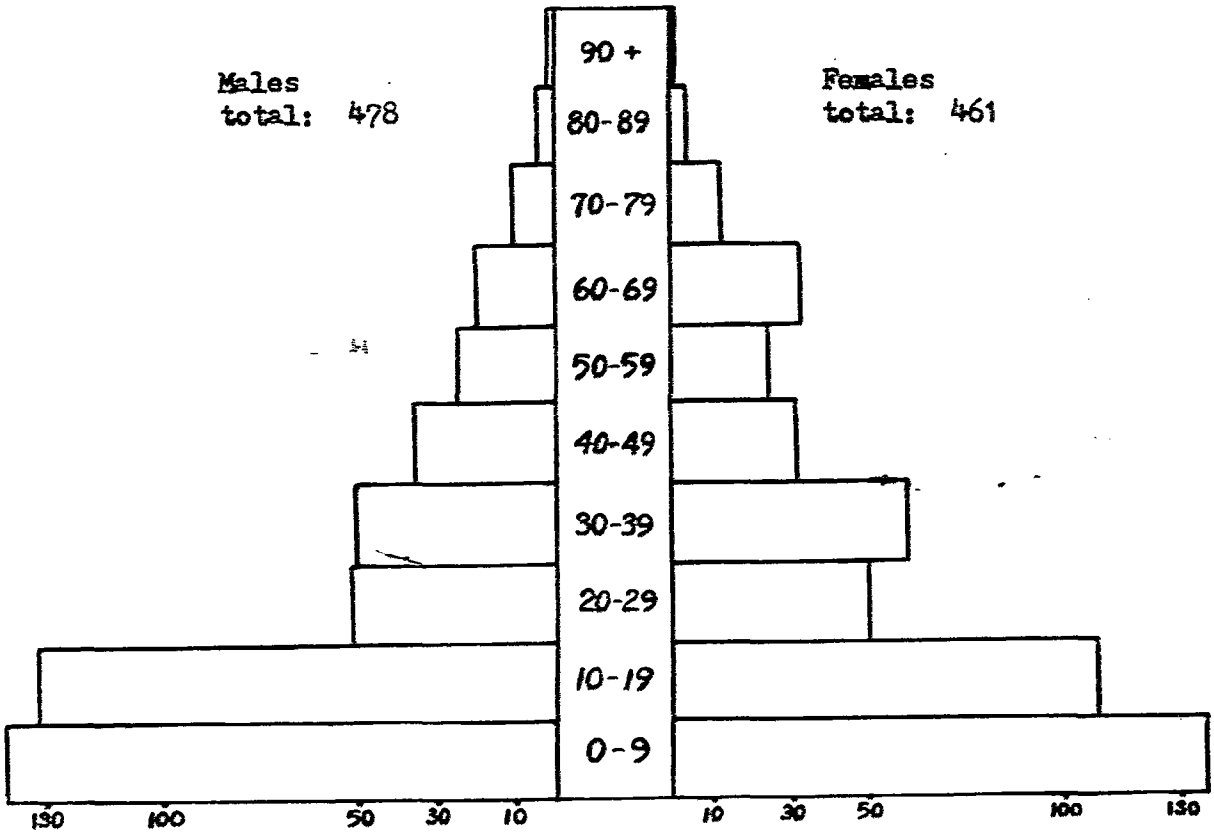


Figure 3.--Population (Age-Sex) Pyramid of Peruvian Campesinos Interviewed



in the size of the family unit, which is here defined as all persons living in one house. On the Peruvian estates, the average size household is 5.70 persons and on the Bolivian ex-haciendas the average is 5.75 persons. The average ages of the two sampled groups of campesinos are 24 and 23 respectively. In both cases, roughly 55% of the campesino populations are under twenty years of age. Figures 2 and 3 summarizes this information in the form of population pyramids.

Two important distinctions of these haciendas and ex-haciendas must be born in mind throughout. First, although the same absolute number of campesino family heads were interviewed on both sides of the border, the sample of 167 Peruvian campesinos represents 95% of all

hacienda employees while the 167 Bolivian *campesinos* interviewed represent only 25% of the total number of *campesino* families on the ex-haciendas. Second, while the same number of haciendas and ex-haciendas were studied, the former have twice the land extension as the latter.[2] When these *campesinos* who were not interviewed are included, the Bolivian ex-haciendas are seen to support a total population nearly four times greater than the Peruvian haciendas. Thus the population density of the Bolivian ex-haciendas is more than eight times that of the Peruvian haciendas.

TABLE 11

TOTAL POPULATIONS, "ECONOMICALLY ACTIVE POPULATIONS," AND POPULATION DENSITIES OF THE PERUVIAN HACIENDAS AND BOLIVIAN EX-HACIENDAS (including those *campesinos* not interviewed)

	Peruvian Haciendas	Bolivian Ex-haciendas
Total population[a]	998	3,847
Total "economically active" population[b]	560	2,141
Population density per square mile	8.3	67.9

[a]Based upon an average of 5.7 persons per Peruvian family and 5.75 persons per Bolivian family.

[b]Computed on the basis of the following weights furnished by the Oficina Nacional de Evaluación de Recursos Naturales de Puno, Peru:

Male over 17 years of age = 1
Female over 17 years of age = .8
Male and Female 10 to 17 years of age = .5
All others = 0

[2]Above, Table 9, p. 50 and Table 10, p. 55.

There exists abundant evidence that this great difference in population density is typical of the other haciendas and ex-haciendas in the Lake Titicaca region and elsewhere in the Department of Puno, Peru, and La Paz, Bolivia. For example, on the Peruvian side, a sample study of 60 haciendas in Puno exceeding 1,000 hectares shows a population per square mile of 7.3, excluding supervisory personnel.[3] If this latter group were included, the population density would very nearly equal that of the four haciendas studied by this writer. The supporting evidence that the population density on other Bolivian ex-haciendas is similar to that of the four studied is arrived at indirectly. The 1946 Bolivian ministry of Agriculture study of 39 haciendas in the Region shows a population density of 35 persons per square mile.[4] Information obtained from the expedientes (files of documents relating to the formal distribution of land) and sindicato leaders indicates that the number of campesino families on the four ex-haciendas researched has nearly doubled since the 1953 agrarian reform. A cursory investigation of a number of other ex-hacienda expedientes in the archives of the Consejo Nacional de la Reforma Agraria reveals that population has increased between 50% and 100% on nearly every ex-hacienda in the Region. In addition to the natural increase in population on these ex-estates, there has been a substantial migration to these lands from the indigenous communities, villages, and cities.

[3] Sample Study of Haciendas in the Department of Puno, 1965, prepared by the Oficina Nacional de la Reforma Agraria, Puno, Peru (in the files of the Agrarian Reform Office).

[4] Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, p. 12.

Insofar as the Bolivian land reform has been influential in having the Department of Puno declared an agrarian reform zone and the campesinos entitled to a minimum wage, it is also partially responsible for the observed low population density on the Peruvian haciendas in the Region.[5] While it is true that the population density of the Peruvian haciendas was substantially smaller than that of the Bolivian haciendas before 1953, the trend has been one of a diminution of the number of campesino families per square mile on these estates. The Peruvian agrarian reform and minimum wage laws have been powerful factors in causing an exodus of campesinos to the small towns within the area and to cities outside the Department, such as Arequipa and Lima.[6] In sum, the Bolivian land reform has directly given rise to a greater density of population on the Bolivian ex-haciendas, and indirectly influenced the decreased population density on the Peruvian haciendas in the Lake Titicaca region. The importance of these changes and differences in population densities will soon become apparent in the discussion of total output and productivity.

2. Land and Its Use

As one would expect, the greater population density on the Bolivian ex-haciendas is accompanied by a more intensive utilization of the land as summarized in Tables 12 and 13 below:

[5]Since these two decrees have been in existence, the hacendados have been reducing the number of campesino families on their estates by denying young campesinos employment and permission to remain on the land as well as forcing old employees to leave by increasing their work loads beyond tolerance levels. This last tactic is necessary for the owner because it is now illegal to dismiss older employees without "just" cause.

[6]Recursos Naturales del Departamento de Puno, pp. 10, 13-15.

TABLE 12

LAND AREA (IN HECTARES) USED BY THE PERUVIAN CAMPESINOS INTERVIEWED AND THE HACENDADOS

Type of Land	Cultivated by and for: Campesinos	Cultivated by and for: Hacendados	Pasture and/or Land in Rest Used Jointly: Campesinos[a]	Pasture and/or Land in Rest Used Jointly: Hacendados	Pasture and/or Land in Rest Used Jointly	Total Land Area
Level	5.5	53.0	220.0	15,582.0	4,328.5	20,189.0
Hill and/or Broken	17.7	41.0	615.0	-	10,260.3	10,934.0
Total	23.2	94.0	835.0	15,582.0	14,588.8	31,123.0

[a]These figures are estimates based upon an average of five hectares of pasture per campesino sayaña.

TABLE 13

LAND AREA (IN HECTARES) USED BY THE BOLIVIAN CAMPESINOS INTERVIEWED[a]

Type of Land	Cultivated by and for: Campesinos	Cultivated by and for: Campesino Cooperative	Pasture and/or Land in Rest Used Jointly: Campesinos	Pasture and/or Land in Rest Used Jointly: Campesino Cooperative	Pasture and/or Land in Rest Used Jointly	Total Land Area
Level	75.65	3.94	589.80	264.74	418.47	1,352.60
Hill and/or Broken	105.80	.80	207.55	513.82	1,716.89	2,544.86
Total	181.45	4.74	797.35	778.56	2,135.36	3,897.46

[a]Only that land of the ex-haciendas used by the interviewed campesinos is included. This includes the land of their sayañas, 39% of all land held cooperatively, and 25% of all other land of the ex-haciendas.

It is evident that the Bolivian campesinos do not own, on the average, between 10 and 35 hectares of land as prescribed by Article 15 of the Decreto de la Reforma Agraria. Excluding the land worked cooperatively, owned either by the campesinos or the State, each family has an average of only 6 hectares for their exclusive use, which equals that of the Peruvian campesinos. However, there is great dispersion around this average figure with some peasant farms having less than 2 hectares and others exceeding 15 hectares in size. Many of these holdings are also highly fragmented.[7] The land reform was a redistribution of the hacendado lands to their former employees, family members, and others. It did not necessarily result in an augmentation of the land in their sayañas. Of course the Bolivians now own the land in their sayañas and have use of all the other lands of these ex-haciendas even though they do not have legal possession of those portions of the ex-haciendas.

It is interesting to note that the Bolivian campesinos interviewed cultivated 1,086 hectares per family while the Peruvians

[7]Although 60 of the 167 Bolivian campesino farms are not fragmented, the remainder are composed of small plots, and the overall average is 5 lots per campesino sayaña.

DISTRIBUTION OF BOLIVIAN CAMPESINO SAYAÑAS

Land (Hectares)	Number	Land (Hectares)	Number
0 - .9	7	8 - 8.9	2
1 - 1.9	24	9 - 9.9	1
2 - 2.9	27	10 -10.9	34
3 - 3.9	17	11 -11.9	-
4 - 4.9	15	12 -12.9	2
5 - 5.9	8	13 -13.9	3
6 - 6.9	7	14 -14.9	1
7 - 7.9	3	15 and above	16

cultivated only .138 hectare per family for their exclusive benefit. When the land cultivated by these same campesinos for the Peruvian hacendados and in the Bolivian cooperatives is included, this difference is less pronounced. An average of 1.115 hectares were cultivated per Bolivian campesino family interviewed compared to an average of .701 hectare per Peruvian campesino family. However, this difference in land area cultivated is greatly magnified when account is taken of those Bolivian campesinos not interviewed. A comparison of Tables 12 and 14 shows that the total number of Bolivian campesinos cultivated six times the amount of land of their Peruvian neighbors on the haciendas during the agricultural year 1964-1965 in spite of the fact that they had at their disposal less than half as much total land.

TABLE 14

LAND AREA (IN HECTARES) USED BY THE BOLIVIAN CAMPESINOS
(including those campesinos not interviewed)

Type of Land	Cultivated by and for: Campesino[a]	Cultivated by and for: Cooperatives	Pasture and/or Land in Rest: Campesino[a]	Pasture and/or Land in Rest: Cooperatives	Pasture and/or Land in Rest: Used Jointly	Total Land Area
Level	342	10	2,678	685	2,929	6,644
Hill and/or Broken	378	2	602	1,529	5,523	8,035
Total	720	12	3,280	2,214	8,452	14,679

[a]These figures are computed on the basis of the random sample averages obtained from those campesinos interviewed. See Table 13 above.

These Tables also show that approximately five percent of the total land area of the Bolivian ex-haciendas was cultivated as compared to less than one half of one percent of the total land area of the Peruvian haciendas.[8]

Again, further evidence is available to support these findings. The sample study of haciendas in the Department of Puno, Peru, provides figures which show that less than 1% of the total area of these estates was under cultivation during the agricultural year 1964-1965. There is also little dispersion around this sample average among the haciendas.[9] A similar study of ex-haciendas in the Altiplano of the Department of La Paz, Bolivia, found sixty campesinos with an average of 7.13 hectares per sayaña cultivating 1.72 hectares.[10]

What portion of this observed difference in land utilization can be attributed to changes wrought by the Bolivian agrarian reform? The answer is that the Bolivian land reform, which was shown to have caused an increase in the population density in the area, apparently also gave rise to a slightly more intensive use of the land. The 1946 Bolivian Ministry of Agriculture study found those haciendas exceeding 2,000 hectares cultivating only 6% of their total extension. There was also great dispersion around this sampled average, with some of the haciendas

[8]This difference in land utilization is not a consequence of varying soil fertility, irrigation, or surface configuration. Neither the haciendas nor ex-haciendas irrigated more than an infinitesimal small portion of their pastures. Hill land is also more conducive to cultivation than level land since it affords some protection from frosts.

[9]Sample Study of Haciendas in the Department of Puno, Peru, passim.

[10]Bolivia: Dirección General de Económica Agrícola, Estudio Económico Estadístico del Canton Viacha (La Paz: 1965), Table 12, p. 28. (Mimeographed.)

cultivating less than 1% of their land. Most interesting is the fact that two-thirds of all cultivated land was cultivated for the exclusive benefit of the campesinos.[11]

It can be concluded from the above that the diverse location of the main consumer markets in the Lake Titicaca region and the different pre-reform population densities set the basic pattern of land utilization observed on the haciendas and ex-haciendas, and this situation has not been significantly modified by the advent of the Bolivian land reform. While it is true that the Bolivian campesinos, in the aggregate, are cultivating about the same percentage of land today as they did before the agrarian reform and have in their sayañas approximately the same proportion of the estate lands, many of these same ex-haciendas are supporting nearly twice their previous populations.

Another important distinction between the Peruvian haciendas of today and the Bolivian haciendas of pre-reform days is that the Bolivian haciendas were to a much greater degree mere agglomerations of small campesino farms, as William E. Carter recognized:

> Ownership of a hacienda in pre-reform days could not be taken at its face value, then. Though the landlord had legal title to its entire area, he was in fact limited to an impressively small portion of it. The rest was exploited by and for the peasant . . .[12]

Of course this was a self-imposed limitation incurred for the benefit of securing the labor of the campesinos. Because the Peruvian landowners are now required by law to pay their Indian laborers a money wage, their need for such large amounts of marginal land is lessened. In this respect the Peruvian haciendas also differ from the pre-reform Bolivian haciendas which did not typically pay their laborers a money wage.

[11]Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, pp. 6-8.

[12]Carter, p. 71.

3. Physical Capital and Livestock Densities

Capital is the other economic input investigated. However, the nature of these traditional agricultural units precluded more than a consideration of physical plant and equipment, livestock, and education.[13] In this section, only the first two types of capital will be discussed, with education being deferred to the next chapter of this paper.

a. Physical Plant and Equipment. Of the four Peruvian haciendas visited, only one had a physical plant which included a house, shearing-shed, barn, sheep-baths, etc., constructed of cement with calamine roofing. The other three haciendas had only rudimentary physical plants constructed of adobe brick with paja (grass) roofs. All of these houses and other buildings were in various stages of deterioration.[14]

On the Bolivian ex-haciendas, one notices the deliberately destroyed physical plant of the old hacendados alongside the new homes and schools constructed by the campesinos since the land reform. The Bolivians constructed 99 new homes since the land reform, whereas only 49 Peruvian campesinos improved their dwellings during this same period without building any new ones. The only constructions of the old estates to survive are the capillas (small churches) and irrigation ditches. Contrary to what one might believe, this destruction was rational from the point of view of the campesinos and resulted in no great social loss. These old adobe constructions, which were in very poor condition even

[13]Working capital and depreciation data were not obtainable. In addition, inflation and the fact that most of the buildings and hand-tools were self-made prevented monetizing most of this capital.

[14]The very poor condition of these houses is due to the fact that only two administrators lived on the haciendas year-round, and only one with his family.

before 1953 and whose ownership is now questionable, were of little value to the campesinos or anyone else.[15] The exceptions to the above are those edifices of Ex-hacienda I which are owned by the Bolivian Agricultural Bank and used cooperatively by the campesinos. Its buildings and equipment are still in fairly good condition.

The campesinos interviewed on both the haciendas and ex-haciendas use the same type and amount of manufactured and self-made hand-tools. However, as Table 15 reveals, the Peruvian haciendas use more technologically sophisticated equipment, especially of the type used in the production of wool. In the aggregate, the Bolivian campesinos possess approximately four times as many hand-tools as do their counterparts on the Peruvian haciendas simply because of their greater numbers. It would be difficult to state categorically whether the haciendas or ex-haciendas possess the greater quantity of physical capital because it is virtually impossible to weigh the greater quantity of hand-tools and new constructions on the Bolivian ex-haciendas against the old physical plant and more technologically-advanced equipment of the Peruvian haciendas.

Personal observation in the Region, as well as those studies of Peruvian haciendas and Bolivian ex-haciendas previously referred to, strengthen these findings inasmuch as the Peruvian haciendas do possess a great deal more agricultural machinery than the Bolivian ex-haciendas. In addition, since the passage of the Peruvian land reform law, there has been an added incentive to mechanize.[16] On the other hand, this type

[15] In the Bolivian Ministry of Agriculture study, the poor condition of these predominately adobe constructions was noted and the statement made that only 14% of the estate houses were habitable. Also, only three of the thirty-nine haciendas surveyed had sheep-baths, and only nine used irrigation for cultivation. See Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, pp. 24 and 39.

[16] See above, p. 44.

TABLE 15

TYPES AND AMOUNTS OF AGRICULTURAL EQUIPMENT OF THE CAMPESINOS AND HACENDADOS INTERVIEWED

	PERU			BOLIVIA[a]		
Type of Equipment	Campesinos	Hacendados	Total	Campesinos	Cooperatives	Total
Wooden Plows	120	14	134	218	-	218
Shovels	152	168	320	178	-	178
Axes	8	4	12	25	-	25
Picks	64	155	219	222	-	222
Wheelbarrows	21	41	62	4	-	4
Hoes	4	80	84	14	-	14
Varitas (7' steel poles)	-	49	49	163	-	163
Leukanas (picks)	170	-	170	509	-	509
Tacclas (spades)	222	60	282	6	-	6
Tractors	-	3	3	-	2	2
Tractor Accessories[b]	-	3	3	-	1	1
Vehicles	-	2	2	-	-	-
Trailers	-	2	2	-	1	1
Veterinary Instruments	-	4 sets	4 sets	-	1 set	1 set
Sheep Shearers	-	142	142	-	15	15
Wool Presses	-	2	2	-	-	-
Water Pumps	-	6	6	-	1	1
Mechanical Mules	-	1	1	-	1	1
Electric Motors	-	3	3	-	1	1

[a]All this equipment was the property of the cooperative in Ex-hacienda I and was not weighted due to the indivisibility of such capital.

[b]Cultivators, plows, harrowers, seeders, harvesters, etc.

of equipment is conspicuously lacking in the Bolivian sector. Apparently there has been a decrease in the amount of tractors, cultivators, etc. in the area since the advent of the land reform. One-third of the haciendas studied by the Bolivian Ministry of Agriculture in 1946 reported possession of tractors and similar type farm equipment.[17] Although there is no information available on the amount of such agricultural machinery on the Bolivian ex-haciendas, there is probably less in existence today than before the land reform. There are three reasons for the decrease in the amount of agricultural machinery in the Bolivian sector since 1953. First, a number of the former hacendados were able to remove some of this mobile machinery. Secondly, much of this type of equipment was destroyed by the campesinos or was simply permitted to deteriorate. Finally, there has been no influx of agricultural machinery either for replacement or addition to existing stock. The Bolivian campesinos have had neither the funds nor inclination to purchase this type of capital equipment.

b. Capital in Livestock and Livestock Densities. The most important and numerous type of capital on both the Peruvian haciendas and Bolivian ex-haciendas is livestock. Table 16 below gives the breakdown of the respective livestock populations.

[17] Incidentally, this relatively high proportion of mechanized farms helps to explain their having cultivated the same percentage of land with one-third to one-half as much labor as is presently engaged in production on these lands. See Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, p. 13, and Annexes 33-37, p. 67.

TABLE 16

DISTRIBUTION OF TOTAL LIVESTOCK ON THE HACIENDAS AND EX-HACIENDAS[a]
(including animals of those campesinos not interviewed)

	Peru			Bolivia		
	Campesinos	Hacendados	Total	Campesinos	Cooperatives	Total
Sheep	9,592	52,955	62,547	18,156	845	19,001
Cattle	1,334	1,512	2,846	2,348	42	2,390
Horses	385	115	500	16	-	16
Burros	229	7	236	381	-	381
Alpaca	607	236	843	-	-	-
Llama	321	-	321	1,455	-	1,455
Fowl	253	41	295	1,508	-	1,508
Pigs	61	7	68	1,704	38	1,778

[a]These total figures are based upon the sample data obtained from those campesinos interviewed. See Appendices C and E for sampled figures.

By making allowance for the difference in land extension and population density on the haciendas and ex-haciendas, one can arrive at some interesting statistics. Reducing all grazing livestock to the common denominator of a sheep enables the computation of a livestock density per hectare. This sheep equivalent is referred to as a U.A.O. (unidas animal ovino).[18] When the livestock is properly weighted and the

[18]There are various methods used to compute this sheep equivalent unit (U.A.O.) which is the reduction of all grazing animals to the capacity of an adult sheep. The one used here is that of the Agrarian Reform Office of Puno, Peru:

Sheep = 1 Cattle = 6 Horses and Burros = 8 Alpacas and Llamas = 3 Pigs = 2

land extension considered, the resulting data reveal a livestock (U.A.O.) density of 3.0 on the Bolivian ex-haciendas, which is nearly identical to the corresponding figure of 2.9 on the Peruvian haciendas. In short, the haciendas and ex-haciendas support an equal density of livestock per hectare. It is interesting to note that the Peruvian campesinos own twice as many and herd eight times as many U.A.O.'s per family as the Bolivian campesinos.

TABLE 17

NUMBER OF LIVESTOCK PER CAMPESINO FAMILY INTERVIEWED

Owned by:	Sheep[a]	Cattle[a]	Horses and Burros	Llamas and Alpacas	Pigs	Sheep Equivalents (U.A.O.'s)
Bolivian Campesinos Interviewed	29.2	3.6	.6	2.2	2.7	67.6
Peruvian Campesinos Interviewed	54.7	7.6	3.5	5.3	.4	145.0
Peruvian Campesinos and Hacendados Interviewed	371.8	16.7	4.2	6.7	.4	526.5

[a]As pointed out on page 40 of this paper, the sheep and cattle owned by the Peruvian hacendados are better breeds than those of either group of campesinos.

Additional information is available to support these findings. Bolivian campesinos on eleven ex-haciendas in Canton Viacha own an average of 66.2 U.A.O.'s per family.[19] A sample study of other Peruvian

[19]Estudio Económico del Canton Viacha, passim.

haciendas in the Region reveals that the campesinos have in their possession between 125 and 220 U.A.O.'s per family. These same haciendas also require each campesino family to herd between 300 and 600 U.A.O.'s.[20] This evidence indicates that the Peruvian campesinos in the Lake Titicaca region typically own more than twice as many animals and herd between five and ten times more animals than do the Bolivian campesinos. However, both the Peruvian haciendas and the Bolivian ex-haciendas apparently have nearly identical livestock densities per hectare. The figure of 3 U.A.O.'s per hectare appears to be some optimum capacity given the resources and traditional methods of livestock ranching.

Nevertheless, the available information does not suggest that these observed differences are necessarily the result of the Bolivian land reform. According to the 1946 Bolivian Ministry of Agriculture report, the campesino families only owned an average of 93 U.A.O.'s before the land reform. Because these same campesinos owned 75% of all the livestock on these haciendas, they had in their care an average of only 122 U.A.O.'s per family. Also, the livestock density per hectare on these 39 sampled haciendas was 3.3.[21] With respect to capital in livestock, the Peruvian haciendas serve as very imperfect proxies for the Bolivian haciendas. Unlike the present-day Peruvian hacendados, the pre-reform Bolivian hacendados owned a much smaller proportion of the number of livestock on the estates. In addition, their sheep and cattle

[20] Sample Study of Haciendas in the Department of Puno, Peru, passim.

[21] Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, pp. 65-66, and Annexes 55-63, pp. 77-81.

were nearly all of the degenerate criollo breed.[22] This points out two important differences between the Peruvian haciendas and the pre-reform Bolivian haciendas. To a much greater extent, the Bolivian haciendas were agglomerations of small campesino farms. Also, they did not concentrate upon wool production for international markets as do the Peruvian haciendas. Therefore, the absence of better breed livestock in the Bolivian sector of the Region is not evidence of wholesale degeneration since the land reform.[23] However, it cannot be denied that there has been no stock improvement and that the herds have deteriorated in quality.

Since the 1953 land reform, there has been an apparent decrease in the number of animals owned per Bolivian campesino family. However, the livestock density per hectare on the ex-haciendas has not decreased. If the 3 U.A.O.'s per hectare is the optimum capacity under existing conditions, then it follows that the only way these lands could support additional families with livestock is by a reduction in the number of animals per family. The reduced size of family herds and the elimination of obligations to the hacendados has resulted in the freeing of substantial labor time. Inasmuch as there has been no apparent reduction of the total number of animals in the Bolivian sector since the land reform, does this merely indicate that the campesinos confiscated the entire herds of the hacendados? Seizure and destruction of those animals did take place immediately after the land reform, but apparently not to the extent

[22] With the exception of two of the haciendas investigated, all of the remainder had only 800 Merino and Corriedale sheep and virtually no better breed of cattle. Ibid.

[23] Opponents of the Bolivian land reform are fond of relating an incident in which the campesinos barbecued a prize bull worth thousands of dollars. Possibly this is a true story, but it is equally certain that such cases were undoubtedly more rare than the infinitesimal number of such fine animals in existence at the time.

generally believed. Many of the campesinos and sindicato leaders interviewed personally assured this writer that a number of the hacendados were able to remove their animals from the estates before and immediately after the advent of the agrarian reform. This is reflected by the increased meat consumption in the city of La Paz and the nation during 1952 and 1953.[24] A number of these hacendado livestock herds were neglected immediately following the reform because of the unstable social and political situation, resulting in the loss of many of these animals. It is impossible to determine how much of these herds was salvaged by the hacendados, how much perished through neglect, and how much was confiscated by the campesinos. The impression gained is that the absolute number of these animals decreased immediately after the reform but has since been built up to the previous level. Under no circumstance could the land reform have affected more than 25% of the pre-reform animal population in the Lake Titicaca region.

4. Institutional Utilization of Economic Resources

Equally conducive to a comprehension of the relative economic performances of the Peruvian haciendas and Bolivian ex-haciendas in the Region is a knowledge of the different utilization of the existing economic resources arising from the diverse land tenure systems and the dissimilar resource mix. Because of the institutional nature of these traditional agrarian sectors, possession of economic resources does not imply their rational utilization. For example, it is common knowledge that approximately 90% of the Peruvian haciendas in the Region are

[24] Bolivia: Proyecto de Rehabilitación Industrial--Mercados y Comercialización, La Producción Ganadera y La Rehabilitación de La Industria de Carne Faenada (La Paz), Tables 2, 10, 11, 19, and Graphs 1, 2. (Unpublished.)

absentee owned, but it is less well-known that most of these same estates are also absentee managed--at least part of the time. On two of the four Peruvian haciendas sampled, the administrators personally managed their estates only when their organizing abilities were most needed, during planting, harvesting, shearing, etc. How widespread this phenomenon is would be very difficult to ascertain. However, this writer has every reason to believe that absentee management is typical of the Peruvian estates in the Lake Titicaca region. Evidence is also available which indicates that most of the pre-reform Bolivian haciendas in the area were also characterized by absentee ownership and management.[25]

This fact helps to explain the underutilization of the agricultural machinery on the Peruvian haciendas. Of the four haciendas researched, only one was observed to use its tractor as an integral part of the production process.[26] Also, the one Bolivian ex-hacienda which had at its disposal such equipment did not use it productively. Therefore, the existence or nonexistence of such technologically-sophisticated machinery apparently has little influence upon production or productive efficiency under these circumstances.

The different quantities and use of land on the Peruvian haciendas and Bolivian ex-haciendas is, however, an important factor which does help to explain the relative productiveness of these agricultural units. The combination of the small number of Peruvian campesinos and the small percentage of total land area cultivated makes it possible for both the

[25] Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, p. 27.

[26] This writer arrived at one of the haciendas with the absentee administrator to find the land prepared and the seed planted. All this was accomplished without the use of the shinny new tractor or the administrator.

hacendados and campesinos to choose only the most productive hectares for cultivation. Generally only the protected sides of the fertile foothills are used. On the other hand, the greater number of Bolivian campesinos in relation to land area has the effect of bringing under cultivation the marginal land of the exposed and relatively unproductive high plain. This is complicated by the existence on the ex-haciendas of tracts of fertile land which are legally the property of the ex-hacendados, but controlled by the campesinos. Most of this land is ideally suited to cultivation but is being used as pasture as a result of the legal ambiguity. Until the problem is resolved, this land will not be allocated to its most productive use.

On the Peruvian haciendas, the hacendados have both legal and customary first choice of land for the cultivation of their crops and the pasturing of their animals. In general, all the lower irrigated pastures and the most fertile and protected land is exclusively reserved for the use of the hacendados. Figures 4 and 5 below illustrate the different utilization of land on the haciendas and ex-haciendas.

Because a smaller quantity of labor is combined with greater amounts of other resources such as land and livestock capital, the campesino labor is more fully utilized on the Peruvian haciendas than on the Bolivian ex-haciendas. Typically each Peruvian campesino has assigned to his care 400 to 500 head of livestock which his family herds while he devotes a full 40-hour work week to the cultivation of hacendado land, shearing of the sheep, and the maintenance of the land and buildings. He accomplishes all of this in addition to farming land for his exclusive benefit and caring for his animals. Unlike the situation which existed on pre-reform Bolivian haciendas, the Peruvian campesino has fewer pongueaje (servant) and transportation obligations than did the Bolivian campesino.

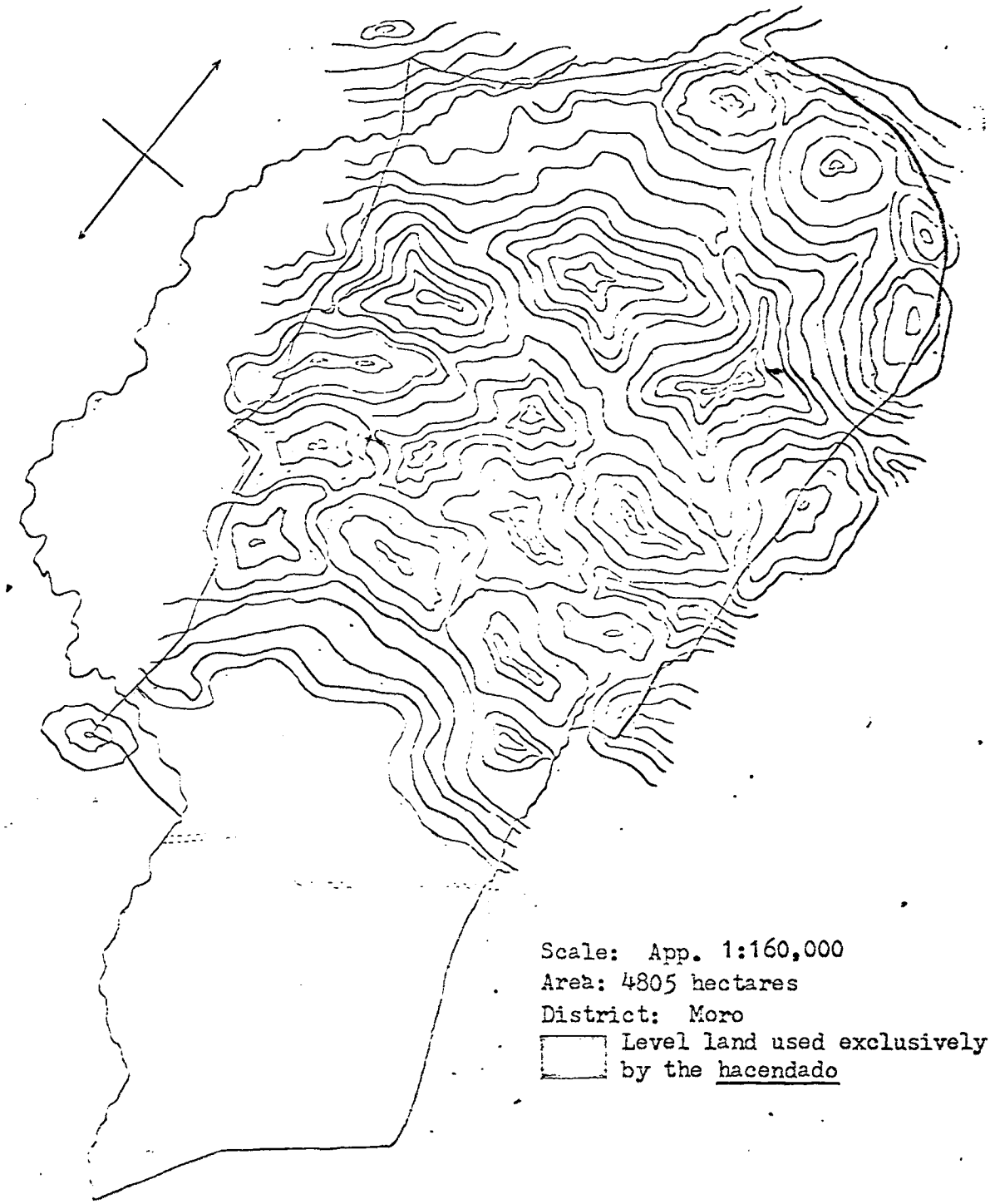


Figure 4.--Peruvian Hacienda I

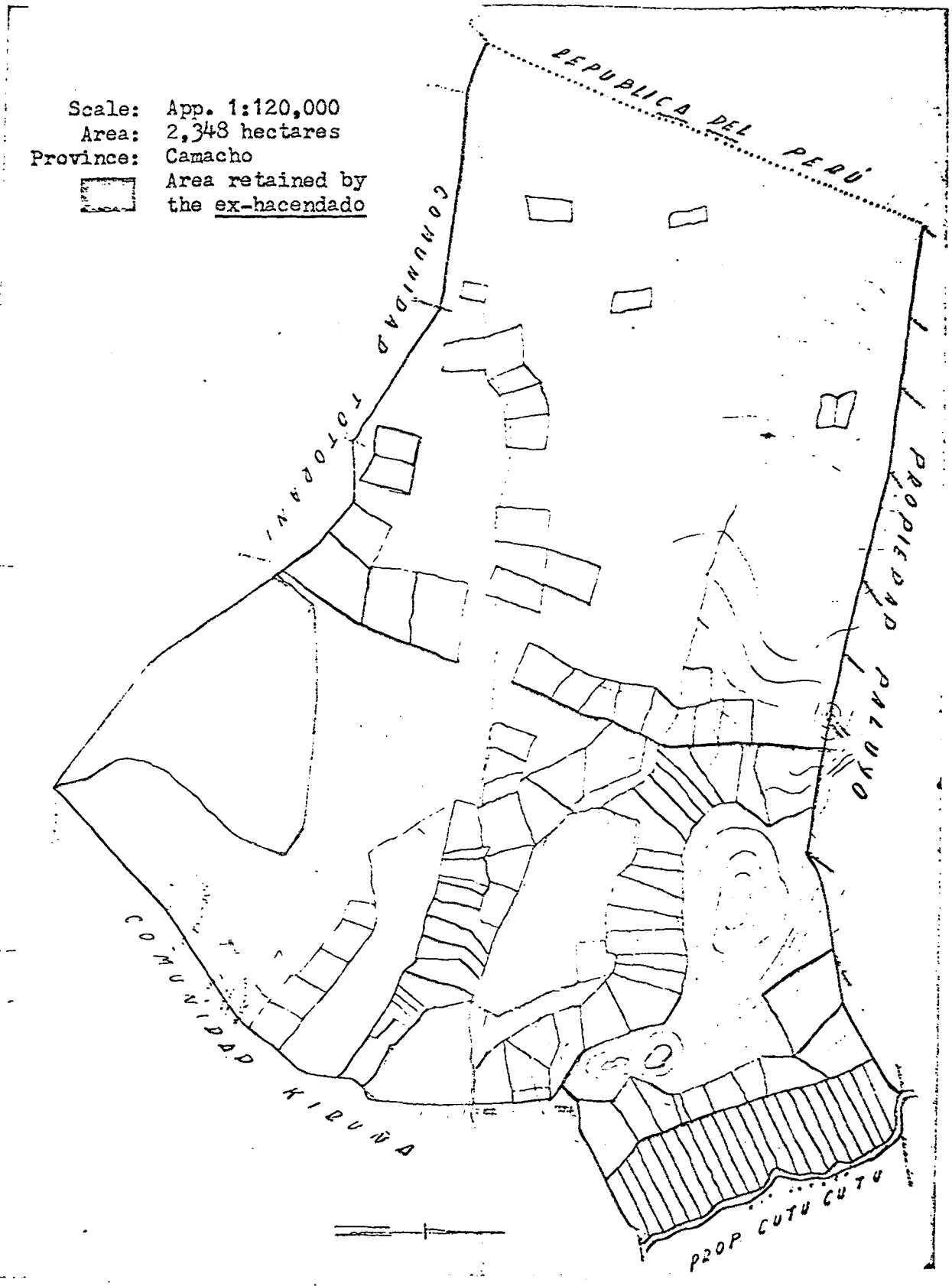


Figure 5.--Bolivian Ex-Hacienda II

The Bolivian campesino on the ex-haciendas did not typically increase his land access or livestock capital to any significant extent, but he did obtain complete control of all his labor time. This is undoubtedly one of the most substantial economic benefits received under the land reform law of 1953. Many campesinos refer to it as their liberación (liberation), and while it is true that there are a number of complaints, every Bolivian campesino interviewed recognized that this redistribution of labor was an intangible but meaningful aspect of the Bolivian land reform. For this reason, among others, land reform is much more than land redistribution. The next chapter of this paper will discuss this labor service redistribution effect of the Bolivian land reform.

B. Average Physical Productivity Statistics

Armed with this background of resource mix and utilization on the haciendas and ex-haciendas, the reader will find this section more readily comprehensible. In the strict economic sense, average productivity statistics have limited theoretical use. Such figures do not, for example, reveal very much about the efficiency or optimum size of the productive firm. What, then, is the rationale for computing and contrasting average productivity statistics of the Peruvian haciendas and Bolivian ex-haciendas studied in the Lake Titicaca region? One reason is the difficulty of obtaining more useful marginal product, revenue, and cost information, although an attempt will be made in the last section of this chapter to obtain such data from a Cobb-Douglas type production function. Nevertheless, a valuable feature of average

productivity statistics, such as output per hectare and output per unit of labor, is their potential short run predictive value via input-output analysis. Also the previous discussion of the diverse institutional utilization and quantities of economic resources will be reflected in these averages. Thus, this analysis of average production will aid the present investigation of the technological efficiency of the haciendas and ex-haciendas.

The data collected in the field study will first be used to compute a number of average productivity statistics, beginning with physical output per seed input for the main crops. Table 18 below shows the Bolivian campesinos produced a greater output per seed input than the Peruvian campesinos producing either for themselves or for the hacendados.

TABLE 18

POUNDS OF OUTPUT PER POUND OF SEED INPUT

Produced for:	Barley	Potatoes	Quinua	Cañahua
Bolivian campesinos	13.0	3.7	21.6	11.8
Peruvian campesinos	-[a]	1.6	9.5	11.8
Peruvian hacendados	7.4	3.4	16.3	10.0

[a]Because of an error in the collection of the data, no comparable information is available for this statistic.

However, when output per hectare input is computed and compared, the Bolivian campesinos do not show the same outstanding performance.

Indeed, in every crop, they produced less per hectare than their Peruvian neighbors. Because only very small quantities of animal fertilizer were used in cultivation, very little if any difference in output can be attributed to this input. Also, the type of seed used by both the haciendas and ex-haciendas was virtually identical.

TABLE 19

POUNDS OF OUTPUT PER HECTARE CULTIVATED INPUT

Produced for:	Barley	Potatoes	Quinua	Cañahua
Bolivian *campesinos*	3,374	4,494	1,536	958
Peruvian *campesinos*	-	4,758	1,815	2,227
Peruvian *hacendados*	4,829	10,073	2,125	774

Before discussing these productivities, another crude index which merits attention is that of output per unit of labor input. This statistic is extremely difficult to compute since the Peruvian *campesino* labor is divided among his own cultivation and that of the *hacendado*. In addition, the labor data obtained in the field study is not broken down into that portion actually used in the production of crops. Consequently only a crude approximation of labor input represented by the "economically active population"[27] on both the haciendas and ex-haciendas was used in computing this statistic.

[27] Above, Table 11, p. 60.

TABLE 20

POUNDS OF OUTPUT PER MAN-YEAR INPUT
(of those who planted only)

Produced for:	Barley	Potatoes	Quinua	Cañahua
Bolivian *campesinos*	361	581	56	59
Peruvian *campesinos*	-	86	26	23
Peruvian *hacendados*	412	987	109	10

What do these statistics reveal? More than anything else, they manifest the different amounts of economic resources available to the parties and the diverse institutional utilization of them. For example, it is not surprising that the Peruvian *hacendados*, having their pick of the most fertile land combined with the intensive utilization of their *campesino* laborers and great quantities of seed,[28] are able to show a greater productiveness per hectare or per unit of labor. Indeed, one would expect other haciendas and ex-haciendas in the Region to show similar average productivities if they possessed the same quality and quantity of resources and used them in a like manner. Since it was previously shown

[28] This greater use of seed is seen below:

POUNDS OF SEED USED PER HECTARE CULTIVATED

Produced for:	Barley	Potatoes	Quinua	Cañahua
Bolivian *campesinos*	260	1,209	73	81
Peruvian *campesinos*	596	2,900	190	187
Peruvian *hacendados*	653	2,931	131	77

in this paper that they do possess these characteristics, it is not surprising to find that the information provided by other researchers in the Region disclose nearly identical average physical productivity figures.[29]

It is somewhat more difficult to compare the performance of the campesinos on the ex-haciendas with that of the hacendados and campesinos on the pre-reform Bolivian haciendas. Climatic conditions play a very important role in the agricultural production of the Altiplano and comparisons over time may reflect changes in this factor above all else. For example, the crop year 1964-1965 was not a good one according to local agronomists. Nevertheless, a comparison is useful inasmuch as it shows that no great change has occurred in the Bolivian sector since the agrarian reform except in average production per man-year. Because of the greater number of campesinos in the area, there has probably been a decrease in output of these crops per campesino man-year equivalent input. Also, with the exception of potato production, the Bolivian campesinos today produce approximately the same output per hectare input as they did before the reform either for themselves or for the hacendados. In contrast to the situation in the Peruvian haciendas, the Bolivian campesinos before 1953 produced the same quantity output--and often a greater output--per hectare cultivated, per unit of labor and per unit of seed capital for themselves as they produced for the hacendados.[30]

[29]Sample Study of Haciendas in the Department of Puno, Peru, passim. Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi, y Los Andes, passim.

[30]These statements are made on the basis of a comparison of the findings of this study with that of the 1946 Bolivian Ministry of Agriculture study Estudio Socio-Económico de las Provincias de Omasuyos, Ingavi, y Los Andes, Annexes 1-28, pp. 50-63.

Laborious comparisons of similar livestock statistics such as wool or meat output per animal will not be made. The Peruvian *hacendados* were previously shown to have cross-breed sheep and cattle and to concentrate on wool production. Consequently the sheep undoubtedly yield a greater average quantity of wool then the animals of either group of *campesinos*. To a lesser extent, the same can be said for the net weight of the sheep and cattle. Again it must be emphasized that this does not reflect a significant degeneration of livestock in the Bolivian sector since the destruction of the *latifundio* land tenure system. The 1946 Bolivian Ministry of Agriculture study of haciendas in the Region provided no data on wool production since the wool of these *criollo* sheep was used almost exclusively for domestic (on the farm) production of rope, clothing, etc.[31]

C. Average Value Productivity Statistics

From an economic point of view, average value productivities, taking into consideration all the outputs and inputs of the firm, are more useful statistics than the partial physical productivity indices computed in the previous section. Such statistics provide an estimate of the average monetary return to each economic resource whether or not it is being fully utilized. In this respect, they are better indicators of economic efficiency. Sufficient data was collected in the field to compute an estimate of these averages for both the Peruvian haciendas and the Bolivian ex-haciendas. In Table 21 are set forth their estimated total gross incomes and products.[32]

[31] *Ibid.*, pp. 22-23.

[32] See Appendices G and H for the total quantities and prices of products sold and consumed based upon the statistical averages obtained in the interviews. In these appendices are also the assumptions and inputations used in the computation of these figures.

TABLE 21

VALUE (IN DOLLARS) OF AGRICULTURAL PRODUCTS SOLD AND CONSUMED
(including products of those campesinos not interviewed)

Type of Product	Peru			Bolivia		
	Campesinos	Hacendados	Total	Cooperatives	Campesinos	Total
Animal						
Sheep	5,159	46,166	51,325	1,117	18,258	19,375
Cattle	4,198	14,397	18,595	215	28,665	28,880
Alpaca & Llama	605	65	670	-	3,660	3,660
Pigs	20	-	20	90	3,185	3,275
Wool	200	64,890	65,090	475	1,475	1,950
Milk	-	9,300	9,300	-	-	-
Cheese	3,300	3,185	6,485	525	19,965	20,490
Hides	2,550	3,450	6,000	720	5,955	6,675
Subtotal	16,032	141,453	157,485	3,142	81,163	84,305
Crop						
Potatoes	675	3,995	4,670	960	26,490	27,450
Quinua	285	535	820	20	1,100	1,120
Cañahua	340	75	415	-	1,100	1,100
Barley	425	1,800	2,225	125	14,265	14,390
Habas	-	-	-	-	4,790	4,790
Oca	-	-	-	-	15,900	15,900
Subtotal	1,725	6,405	8,130	1,105	63,645	64,750
Total	17,757	147,858	165,615	4,247	144,808	149,055
Plus	-	4,630[a]	4,630	-	-	-
Grand Total	17,757	152,488	170,245	4,247	144,808	149,055

[a]This figure is an imputed value for crop production on 40 hectares of Hacienda I based upon the performance of the other haciendas.

With these estimates it is now possible to compute the total average value productivities. It is interesting to note in Table 22 that the greatest difference is in output per man-year. This is of course expected when one recalls the great disparity in population densities on

the ex-haciendas and haciendas. If average value production per man-year is the appropriate measure of efficiency, then the Bolivian ex-haciendas are less efficient. The Peruvian haciendas produced more than four times the output per man-year than the Bolivian ex-haciendas. On the other hand, if gross value production per hectare is the accepted criterion of efficiency, then the reverse is true. The Bolivian ex-haciendas, as seen below, were able to generate almost twice as much output per hectare as the Peruvian haciendas. The other average productivity statistics show no great differentiation.

TABLE 22

AVERAGE VALUE PRODUCTIVITY STATISTICS OF HACIENDAS AND EX-HACIENDAS
(in dollars)

Statistics	Peruvian Haciendas	Bolivian Ex-Haciendas
$\frac{\text{Value Output}}{\text{Hectare}}$	5.47	10.15
$\frac{\text{Value Output}}{\text{Man-years of Labor}}$[a]	304.00	69.62
$\frac{\text{Value Output}}{\text{Livestock Capital}}$[b]	.42	.71
$\frac{\text{Value Animal Products}}{\text{Livestock Capital}}$[b]	.38	.40
$\frac{\text{Value Crops}}{\text{Hectares Cultivated}}$	105.31[c]	88.45

[a]The man-year equivalents of labor figures are the same as the "economically active population" figures computed in Table 11, p. 60 above.

[b]This figure of the total value of livestock was computed by multiplying the average prices in Appendices G and H by the total number of animals in Table 16, p. 72 above.

[c]This average value figure only includes the output of the three haciendas for which data is available.

On the basis of what has been said throughout this chapter, one would expect the other haciendas and ex-haciendas in the Lake Titicaca region to show the same general pattern of performance. Unfortunately, information is not available to make such comparisons. It is also not possible to compare the average value productivities of the ex-haciendas with those of the pre-reform Bolivian haciendas. Indications are, however, that output per man-year has decreased in the Bolivian sector since the 1953 land reform and output per hectare has probably increased. More than this cannot be substantiated by the available evidence.

D. Marginal Analysis of Firm Efficiency

More useful to an economic analysis of firm efficiency is information on production at the margin. What are the costs and returns of an increment of output? Are there economies of scale? Are the firms operating efficiently with optimum size plant? By constructing logarithmic production functions based upon interfirm observations of Bolivian campesino farms and of Peruvian haciendas, additional information was obtained to provide at least qualified answers to these questions.

However, the small size of the sample, the unreliability of the data used, and the nonexistence of resource cost figures combine to limit the statistical validity of the derived production functions. Therefore, only the salient findings will be summarized in this section. The interested reader may consult Appendix J for a more complete discussion of these logarithmic production functions.

Although the derived agricultural production function of the Bolivian campesino farms on the ex-haciendas is not exactly equivalent

to the derived livestock production function of the Peruvian haciendas, a number of comparisons can be made. Both the haciendas and ex-haciendas revealed slightly increasing returns to scale. That is to say that by increasing all inputs by one percent, output would increase by greater than one percent. However, in the case of the Peruvian haciendas, this is somewhat misleading since a marginal increase of only one input, livestock, would increase output by very nearly the same percentage. For both the Peruvian haciendas and the Bolivian ex-haciendas, the production elasticities indicate that a one percent increase in pasture land alone would not give rise to an increase in value output. From these production functions were also computed estimates of marginal value products (MVP), which are estimates of the earning power of inputs at the margin. By comparing these marginal value products to each other and to their respective marginal resource costs, some indications of the allocative efficiency of the firm are revealed. However, the rigor of this type of analysis cannot be extended because the marginal value cost of labor to a Bolivian campesino is an opportunity cost. Also, the small campesino farm is not his sole source of income. Nevertheless, it would appear, on the basis of the derived MVP's, that the Bolivian campesinos would be more efficient if they cultivated a greater portion of their land, seeded their pastures, and increased their livestock herds. However, because of their limited access to capital funds, these campesinos are unable to accomplish this reallocation of resources within a short period of time. On the other hand, the Peruvian haciendas, because of their ability to obtain large amounts of capital, can increase their livestock herds very quickly to take advantage of the high marginal value returns to this resource. But apparently this can only be done by cultivating and irrigating the pastures as well as increasing the number of campesino laborers. For both the Peruvian haciendas and the Bolivian

campesino farms of the ex-haciendas, the marginal value products of pasture land were not significantly different from zero. Inasmuch as an hectare of land in Puno, Peru, costs between $24 and $56, this indicates that most of the large haciendas are inefficiently allocating this resource. They are, however, making efficient use of labor (man-year) since the estimated marginal value product of $87 is nearly equal to the estimated marginal value cost of $105.

Of course, marginal analysis has many limitations. It cannot take into account large input or output changes. It only deals with production, and ignores capital gain and other important factors. But most important, marginal analysis can tell us nothing about the effect of using non-traditional inputs such as improved seed, agricultural equipment, and better-breed livestock.

The tedious task of analyzing the economic efficiency of the campesino farms on the Bolivian ex-haciendas and the Peruvian haciendas in the Lake Titicaca region is now completed. Because of the controversy surrounding this issue, it was deemed necessary to consider this subject from many points of view. With respect to the relative technological efficiencies of the Peruvian haciendas and the Bolivian ex-haciendas, the evidence accumulated in this study indicates a mixed performance and no decisive value-free answer can be given. Accepting one measure of productive efficiency as the criterion, the Peruvian haciendas appear to be relatively more efficient; using another standard of efficiency, the Bolivian ex-haciendas show the better performance. Relative to their potential efficiency, both have been shown to be producing somewhat short of their optimum. Nevertheless, this analysis has been useful in providing numerical estimates of the various efficiency measurements and detailed explanations of their observed differences.

For example, the technically optimum-size enterprises in the Region, under existing institutional and technological conditions, are not the large Peruvian haciendas. The low average value productivity of land and the apparent zero marginal value productivity of land both lend credence to the position taken by proponents of land reform that size economies do not exist on these landed estates.[33] This writer also found no evidence of financial economies of scale, such as quantity discounts resulting from marketing. Less than fifty percent of these estate lands was used by the hacendados. The primary productive purpose of these sections of the haciendas was to provide their campesinos with land in return for their labor services. Since the law requires they pay their laborers a money wage, the rationale for maintaining these large extensions of land has been lessened.[34] It is also evident that the institutional utilization of such indivisible factors of production as agricultural machinery and management prevented the realization of any large scale productivities on the haciendas--if, in fact, they potentially exist. The investigation of the small campesino farms on the Bolivian ex-haciendas exposed this argument of large scale economies to another test. In many ways, these small agricultural units were seen to have been as productive as the large Peruvian estates and in some ways more productive. In addition, the marginal value productivity of pasture land on both the Peruvian haciendas and the Bolivian

[33] Although the derived livestock production function revealed a sum of elasticities greater than unity, it also indicated that the input land had reached a saturation point.

[34] Of course, with increasing population the value of this land has been increasing, and from the strictly private point of view, it is profitable to retain this land. Such activity is not, however, socially productive.

ex-haciendas was not significantly different from zero. These facts seem to indicate that the merits of large size farms in the Region had been exaggerated. In short, the findings of this study are that there exist no overwhelming advantages to any particular size of Altiplano farm, and any potential advantages the large Peruvian haciendas possess could conceivably be made available to the small Bolivian farms by state agriculture extension services.

The pre-reform Bolivian haciendas were, in large measure, merely agglomerations of small campesino farms. It was previously pointed out that two-thirds of the cultivated land of these haciendas was undertaken by the campesinos for their own benefit and three-fourths of all the livestock were owned by these same campesinos. In addition, the Bolivian haciendas were absentee owned, often absentee managed, and possessed predominately criollo livestock and precious little agricultural machinery or other fixed capital.[35] It is not astonishing to discover that the displacement of these hacendados and portions of their economic resources by the new campesinos has resulted in no significant change in either production or productivity. But, did not the increase in campesinos on these ex-haciendas result in lower average and marginal value productivity of labor? Does this not reflect a decrease in efficiency? The answer to the first question is probably yes. The answer to the second question again depends upon one's choice of an efficiency criterion. Unfortunately, the Bolivian agrarian reform law did not specify which "greater productivity" it wished to stimulate. While it is probably true that value output per labor has decreased, it is equally probable

[35] Although most of these comments are based upon the Bolivian Ministry of Agriculture 1946 study of only 39 haciendas, the sample included many of the most progressive and productive estates.

that output per land has increased and output per livestock capital has remained constant since the agrarian reform.

Further analysis of the economic efficiency of the haciendas and ex-haciendas at the level of the firm is restricted by the nature of the campesino farm which is both a source of income and a place of residence from which he ventures to earn off-farm and non-farm income. From the macro-economic point of view, the increased marginal farming in Bolivia due to the land reform may very well be an efficient allocation of the nation's resources in the short-run or until such time that alternative employment is available. The next two chapters of this paper will further examine the relative economic performance of haciendas and ex-haciendas and additional evidence will be presented on the subject of economic efficiency and land reform.

VII. ECONOMIC PROGRESS AND JUSTICE

Two other goals of the Bolivian land reform were to administer economic justice (reduce social and economic inequalities) and to promote economic progress (increase real per capita income). An investigation of these objectives of the reform in the Region is very difficult. There is, first of all, the problem of measurement and standards. For example, how does one weigh the increased production, consumption, and standard of living of the Bolivian campesinos--if any--against their decrease on the part of the hacendados? Where are the Bolivian income and cost-of-living data on the regional level for comparison over time? Secondly, it is questionable whether the twelve or thirteen years which have elapsed since the commencement of the Bolivian agrarian reform is sufficient time to permit an analysis of its developmental effects. Would not such an inquiry at this date be premature and more justly be reserved until at least a few decades have elapsed?

The discussion above should serve as a warning to the reader not to expect a definitive, ultimate, or value-free answer to the question of whether or not the Bolivian land reform has induced economic progress in the region or administered "economic justice" to the parties involved. Nevertheless, these difficulties can be surmounted and an examination of the manner in which the Bolivian land reform affected the economic progress of the region and reduced the inequalities of income, opportunity, and freedom can be undertaken. The definitions of economic development and "justice" used throughout this section are those set forth in the second chapter of this paper.[1] Because the field study was conducted before the developmental changes have fully matured and because of the

[1] See above, pp. 3-6.

nature of the data collected, only a few indicators of economic developmental pre-conditions will be examined. Among these are agricultural surpluses, marketing activity, campesino and hacendado incomes, consumption of manufactured products, and human capital (education). Economic justice will be viewed from the perspective of the welfare of the campesinos, freedom of the labor force, and compensation of the expropriated Bolivian hacendados. It is evident that these two goals of the Bolivian land reform are not mutually exclusive. For example, an increase in the health, welfare, and education of the campesinos simultaneously constitutes a contribution to economic growth and to economic justice.

The same comparative method of analysis will be employed in this section as in the previous one. The Peruvian haciendas and Bolivian ex-haciendas in the Lake Titicaca region will be compared and the salient findings contrasted with the results of pre-reform studies of Bolivian haciendas.

A. Agricultural Surpluses

The contribution of an agricultural surplus to economic development is twofold. First, it provides the domestic economy with food products and raw materials for national industry, which conserves the foreign exchange earnings of the export industries. Secondly, a portion of these surpluses may be exported and the nation's stock of foreign exchange increased. If this international currency is expended on capital goods imports that the nation itself is incapable of producing, then the agricultural surpluses can be said to have contributed to economic development.[2]

[2]This is an oversimplification, and perhaps the words ceteris paribus should have been added. If, for example, this surplus was generated at the cost of an unhealthy, illiterate, and immobile labor force, then its contribution to growth is lessened and even questionable.

This last qualification concerning the use of these foreign exchange funds is a very significant one. In Chapter III of this paper, the pre-reform agrarian sector of the Bolivian economy was observed to be growth retarding. That is to say, it did not generate surpluses for its city populations, national industries, or international markets--at least it did not produce sufficient surpluses to render the nation self-sufficient in food and agricultural raw materials, and its experts were negligible. In sum, the pre-reform Bolivian agriculture, dominated by the latifundio land tenure system, tended "to impede--if not arrest--the ordinary course of economic development."[3]

But is a latifundio land tenure system more capable of generating agricultural surpluses than a tenure system of small campesino farms? What changes in agricultural surpluses have taken place in the Bolivian sector of the Lake Titicaca region since the land reform? What are the implications of these alterations for future economic growth? This investigation begins with a comparison of the agricultural surpluses generated on the Peruvian haciendas and Bolivian ex-haciendas researched in the Region during the agricultural year 1964-1965. Before proceeding to a discussion of the figures in Table 23, a word of caution is warranted. The data for products sold by the campesinos is probably downward biased. Unlike the hacendados, they do not keep business records and must rely upon their memory for recall. In addition, they barter a portion of their output. This downward bias of sales is complicated by the fact that much of the marketing activity of the campesinos is of a social nature, i.e., purchase of an animal and sale of a similar animal at a fair. Nevertheless, the value of products sold does provide a crude approximation of the agricultural surplus.

[3]See above, pp. 14-18.

TABLE 23

VALUE (IN DOLLARS) OF PRODUCTS SOLD BY THE PERUVIAN HACIENDAS AND BOLIVIAN EX-HACIENDAS: 1964-1965[a] (including products of those campesinos not interviewed)

Type of Product	Peru			Bolivia		
	Campesinos	Hacendados	Total	Cooperatives	Campesinos	Total
Animal						
Sheep	1,194	40,539	41,733	978	7,587	8,565
Cattle	4,106	14,349	18,455	217	26,861	27,078
Alpaca & Llama	46	-	46	-	3,226	3,226
Pigs	-	-	-	88	2,457	2,545
Wool	-	64,899[b]	64,899	475	-	475
Milk	-	9,298	9,298	-	-	-
Cheese	1,650	1,097	2,747	145	7,898	8,043
Hides	23	2,604	2,627	-	185	185
Subtotal	7,019	132,786	139,805	1,903	48,214	50,117
Crops						
Potatoes	-	1,250	1,250	120	414	534
Quinua	-	-	-	21	40	61
Cañahua	-	388	388	-	-	-
Barley	-	-	-	125	45	170
Habas	-	-	-	-	266	266
Oca	-	-	-	-	303	303
Subtotal	-	1,638	1,638	266	1,068	1,334
Total	7,019	134,424	141,443	2,169	49,282	51,451
plus	-	1,180[c]	1,180	-	-	-
Grand Total	7,019	135,604	142,623	2,169	49,282	51,451

[a]See Appendices C - H for quantities of products sold and average prices received by the hacendados and campesinos interviewed.

[b]Of this figure $1,104 is value of alpaca wool sold; the remainder is value of sheep's wool.

[c]This figure is an imputed value for crops sold by Hacienda I based upon performance of the other haciendas.

It is evident from the table above that the Peruvian haciendas produce a much greater agricultural surplus than the Bolivian ex-haciendas--nearly three times as much in absolute dollar value. A comparison of this data with that in Table 21 indicates that the 84% of the value output of the Peruvian haciendas is sold and thus only 16% consumed. In contrast, the Bolivian campesinos on the ex-haciendas sell only 35% and consume 65% of the total value output. Therefore, the Peruvian haciendas also sell a greater proportion of total value output. One would expect the Peruvian haciendas with more and better breeds of sheep, twice as much land, and one-fourth the population of the Bolivian ex-haciendas to have greater sales. It is, however, the sale of wool which accounts for the greater part of this difference. All of the products sold by the Bolivian campesinos were destined for national consumption, whereas the Peruvian wool, comprising 46% of all hacienda sales, was sold to international buyers. If one subtracts this amount from total hacienda sales, then the agricultural surpluses generated for domestic consumption on the Peruvian haciendas and Bolivian ex-haciendas are more nearly equal. However, $65,000 of foreign exchange was earned by the Peruvian hacendados. Although this constitutes a potential fund for purchase of foreign capital inputs, this writer has no way of knowing whether or not it was, in fact, used for this purpose.[4] On the other hand, the Bolivian and Peruvian campesinos who possess approximately half as many sheep as the hacendados sell virtually no wool. Admittedly, the wool of these criollo sheep has little international demand. However, there apparently is a market for

[4] In Peru today, as in pre-reform and present-day Bolivia, substantial amounts of foreign exchange are spent for purchases of food imports. In addition, if the Peruvian hacendados used their economic profits in the traditional manner, that portion not conspicuously consumed was probably not invested in a socially productive manner. See above, p. 8.

this type of wool,[5] and the failure to exploit this potential source of wealth is regretable. A report by a number of agricultural experts with the Utah Team of USAID/Bolivia had this to say on the subject:

> A considerable amount of wealth is 'banked' on sheep, llama, and alpaca in Bolivia. It draws no interest, and the annual capital loss through animal deaths and shedding of wool and hair is tremendous. Only a relatively small amount is sheared and sold in the commercial market.[6]

> The minimum wool export value to Bolivia would be about 12 million dollars a year if an adequate marketing system is operative.[7]

On the basis of the evidence set forth in the previous chapter of this paper, one would expect other Peruvian haciendas and Bolivian ex-haciendas in the Lake Titicaca region to show the same differentiated performance in generating agricultural surpluses. But does this difference reflect a change brought about by the Bolivian agrarian reform? When it is recalled that the pre-reform Bolivian haciendas were never exporters of wool, the obvious answer is no.[8] One would also expect the Bolivian campesinos, because of their greater numbers among other reasons, to retain a greater share of the Region's output for their consumption then they did prior to 1953. The extent to which the increased campesino output and commercial activity has been able to offset the decrease in the hacendados agricultural surpluses is difficult to ascertain. However,

[5] Kenneth N. Roberts, et al., Bolivian Wool: A Source of National Wealth (USAID/Bolivia, January, 1966), p. 24. (Mimeographed.)

[6] Ibid., p. 1.

[7] Ibid., General Findings.

[8] See above, pp. 74-75.

most Bolivian agricultural experts agree that after thirteen years, the commercial agriculture output for the nation as a whole has reached pre-reform levels. While relatively new agricultural regions such as Santa Cruz are given most of the credit for this national recovery, the Altiplano, which includes the Lake Titicaca region, has apparently been able to feed its increased campesino population and provide the nation with an agricultural surplus at least equal to that of pre-reform times.[9] The commercial activity of the Bolivian campesinos since the agrarian reform has increased as a result of the greater amount of time now available for such activities as well as increased demand for their output due to the loss of the hacendado supply. This is seen in the numerous local fairs which have come into existence since 1953 as well as the increased coming and going of the Altiplano campesinos. As their output (income) and desire for manufactured products increase, these commercial activities and surpluses can be expected to expand accordingly. For the Bolivian campesino, like his Guatemalan counterpart, is a businessman. As Sol Tax has observed, "the Indian is perhaps above all else an entrepreneur, a business man, always looking for new means of turning a penny."[10] However, unless technology and human capital (education) are forthcoming, these agriculture surpluses, at best, will be augmented at a very slow pace within the framework of this traditional agrarian sector.

[9] The one bit of empirical evidence to support the statement that the Region's agricultural surplus had not decreased since the land reform is found in a report on Bolivian meat production. On a departmental level, this report shows that La Paz produced and sold 7,770 metric tons of beef in 1950 as compared with 8,300 metric tons in 1958. Similar surpluses were generated in other meat production which is, incidentally, the most important commercial product of the Altiplano campesinos. See La Producción Ganadera y La Rehabilitación de la Industria de Carne Faenada, Annex 10 and elsewhere.

[10] Sol Tax, Penny Capitalism (Chicago: University of Chicago Press, 1963), p. 12.

Theodore Schultz of the University of Chicago had this to say on the subject:

> There is at best little opportunity for growth from traditonal agriculture because farmers have exhausted the profitable production possibilities of the state of the arts at their disposal. Better resource allocation and more savings and investment restricted to the factors of production they are employing will not do much for growth. . . . A similar conclusion follows with respect to the growth to be had from increases in the stock of such factors.[11]

The Bolivian land reform is, therefore, not a panacea for the agricultural problems of the Region or nation, and many of the growth-retarding features of the agrarian sector remain. On the other hand, a number of changes have taken place which portend the elimination of a number of growth obstacles in the future. The most obvious of these can be seen in the effect of the Bolivian land reform upon the lives of the campesinos.

B. Income, Welfare, and Education

Aside from land, labor is the only other abundant resource that most underdeveloped nations possess. Of course this is only an asset to economic progress when the labor force is healthy, skilled, and mobile, in addition to being forthcoming in some indeterminate optimum amount relative to other economic resources. Many developmental economists have demonstrated theoretically the merits of (1) freeing the agricultural labor force so that they may migrate to the industrial sector when conditions warrant, (2) providing these laborers with sufficient income to purchase manufactured products as well as keep body and mind together, (3) educating and informing these individuals so that they may become

[11] Schultz, p. 131.

more productive economic resources and participating citizens.[12] A latifundio land tenure system which restricts labor mobility does not pay--or pays very little--money wages to its Indian laborers and retards their educational and economic motivations would to that extent hinder economic progress. Of course, all of this is compounded by the moral, social, and political undesirability of such a situation. But how do the two groups of campesinos in the Lake Titicaca region fare under the different land tenure systems? Did the Bolivian agrarian reform accomplish those changes in the rural labor force which are desirable from the perspective of welfare and conducive to economic development?

1. Incomes and Consumption

An investigation of the incomes and consumption patterns of the campesinos on the Peruvian haciendas and Bolivian ex-haciendas will initiate this analysis. It was previously demonstrated that the Peruvian campesinos were more than four times as productive as the Bolivians.[13] How have they benefited from this relatively high productivity? One would expect the Peruvian campesino to have a higher income and standard of living than the Bolivian since he possesses more livestock, has at his disposal an equal amount of land, and receives a money wage for his labor

[12] The reader may refer to any of the numerous works by these authors. For example, he may consult those publications by Doreen Warriner, Theodore Schultz, Philip Raup, Harvey Leibenstein, and others previously cited in this paper. In addition, he may consult the excellent studies of Arthur W. Lewis, "Economic Development with Unlimited Supplies of Labour," The Manchester School of Economic and Social Studies, XXXII, #2, May, 1954; Bruce F. Johnson and John W. Mellor, "The Role of Agriculture in Economic Development," American Economic Review, LI, #4, September, 1961; and Gustav Ranis and John C. H. Fei, "A Theory of Economic Development," American Economic Review, LI, #4, September, 1961.

[13] See above, p. 88.

services from the hacendado. However, Table 24 below furnishes evidence to the contrary.

TABLE 24

ESTIMATED BOLIVIAN AND PERUVIAN CAMPESINO INCOMES IN DOLLARS
(including those not interviewed)

	Peruvian Campesinos	Bolivian Campesinos
Money wages, salaries, and off-farm earnings[a]	18,221	
Money earnings from sale of farm products[b]	7,019	51,744
Money Income	25,240	51,744
Income-in-kind from consumption of farm products[c]	10,739	97,311
Total Income	35,979	149,055
Money Income per family[d]	144.22	77.35
Total Income per family[d]	205.59	222.80

[a]See Appendix K for a computation of Peruvian campesino net wages. Bolivian campesinos earned wages outside their farms, although no figure can be given for this income.

[b]From Table 23 above, p. 98.

[c]These figures are obtained by subtracting value of products sold in Table 23, p. 98 above from value of products sold and consumed in Table 21, p. 87 above.

[d]Statistics were computed by dividing incomes by the number of campesino families which in Peru is 175 and in Bolivia is 669.

On the basis of this data, the average campesino family of the Bolivian ex-haciendas has the greater total income. However, part of these higher earnings is due to the better prices they receive in the market for their animals.[14] These same campesinos also earn greater money income from the sale of their agricultural produce, but when money wages are included, the Peruvian campesino families are revealed to earn twice as much money as their Bolivian counterparts. However, this last statement must be qualified. In the process of interviewing the Bolivian campesinos this writer realized that they had a source of money income the Peruvian campesinos did not, namely, off-farm employment. Unfortunately, no estimate of this income was obtained for all the campesinos interviewed. Only those campesinos of Ex-hacienda III were asked to reveal their outside employment and the amount of wages earned. Of the 48 campesinos interviewed, 11 worked as laborers outside of agriculture for a period of from one month to one year. In addition, 3 were employed as agricultural laborers in the Yungas region and another 10 were engaged in commercial activity between the Ex-hacienda and La Paz or Caranavi. Thus, approximately one-half of these campesinos were employed at least part-time outside the Ex-hacienda and earned between $6 and $25 a month for their labor. Kelso L. Wessel found half the campesino families on three Altiplano communities with off-farm incomes averaging $125.[15] This indicates that the Bolivian campesinos may typically earn more money than the Peruvians.

Another indication that the Bolivian campesinos have larger money incomes and therefore substantially larger total incomes is their apparent

[14] See Appendices G and H.

[15] Kelso L. Wessel, Social-economic Comparison of Eight Agricultural Communities in the Oriente and the Altiplano, Department of Agricultural Economics of Cornell University (La Paz: June, 1966), p. 75. (Mimeographed.)

higher standard of living as reflected by a greater consumption of manufactured goods and other products. For example, Figure 6 shows that the Bolivian campesinos own more durable goods of all types than the same number of Peruvian campesinos--with the notable exception of bicycles. Figure 7 indicates that the Bolivian campesinos purchase more store-bought dry goods. They also claimed to wear these clothes more frequently. Figure 8 shows that the Bolivian campesinos consume more "luxury" foods and stimulants than their Peruvian neighbors except for coca.[16] One out of every two Bolivians interviewed said they slept on wood or iron beds as compared to only one out of every ten Peruvians. Finally, nearly 60% of the Bolivian campesinos constructed new homes since 1953 while the Peruvians did not build any new ones. In sum, the Bolivian campesinos interviewed revealed a consumption pattern on a per capita basis which indicated that they might have higher money incomes.

Of course, differences in the cost of living or consumption indebtedness could account for this apparent paradox of the Peruvians having a greater money income but a lower standard of living. In regard to debts, the Bolivian campesinos had a per family debt of only $4 which was less than the average of $7.40 owed by the Peruvians.[17] Campesinos, in general, are not debtors, a situation probably due to their inability to borrow. However, the larger size of the Peruvian campesino animal herds could be an indication of greater savings on their part since

[16] It has been suggested that the Indians chew coca to deaden the pain of the hard labor they are required to perform. This study seems to confirm this proposition inasmuch as the Peruvian campesinos do work harder than the Bolivians and chew more coca. A psychological explanation might also be given consideration.

[17] The Bolivian campesino debt does not include a $15,827 debt of the cooperative of Ex-hacienda I which is owed to the Agricultural Bank for the ex-hacendado property. See Appendix L for a breakdown of the campesino debt obligations.

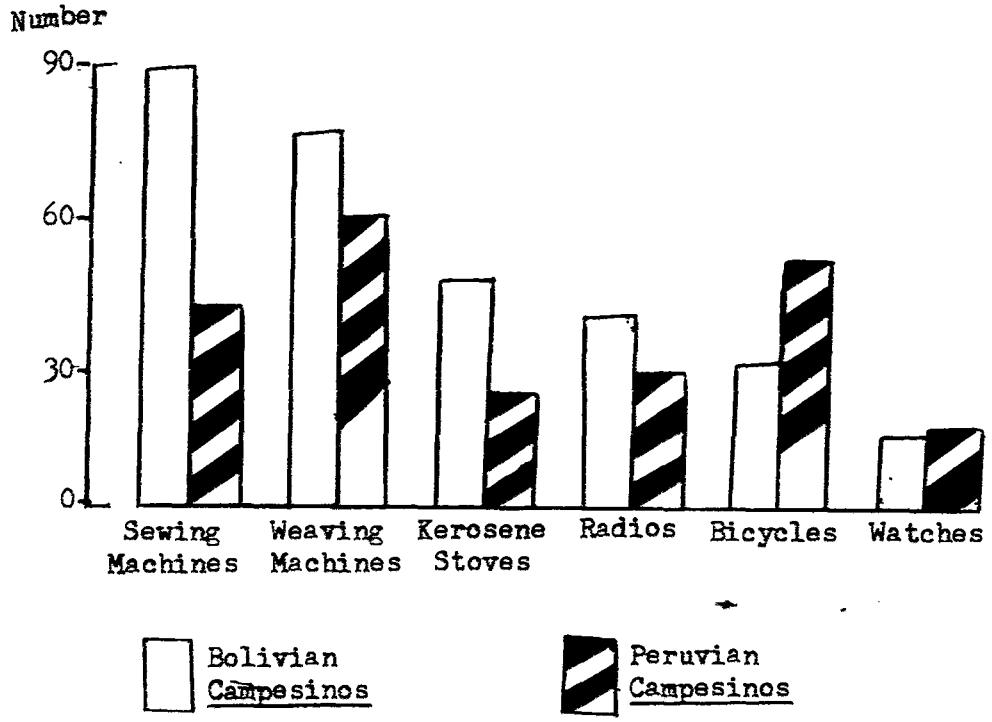


Figure 6.--Number of Durable Goods Owned by Campesinos Interviewed

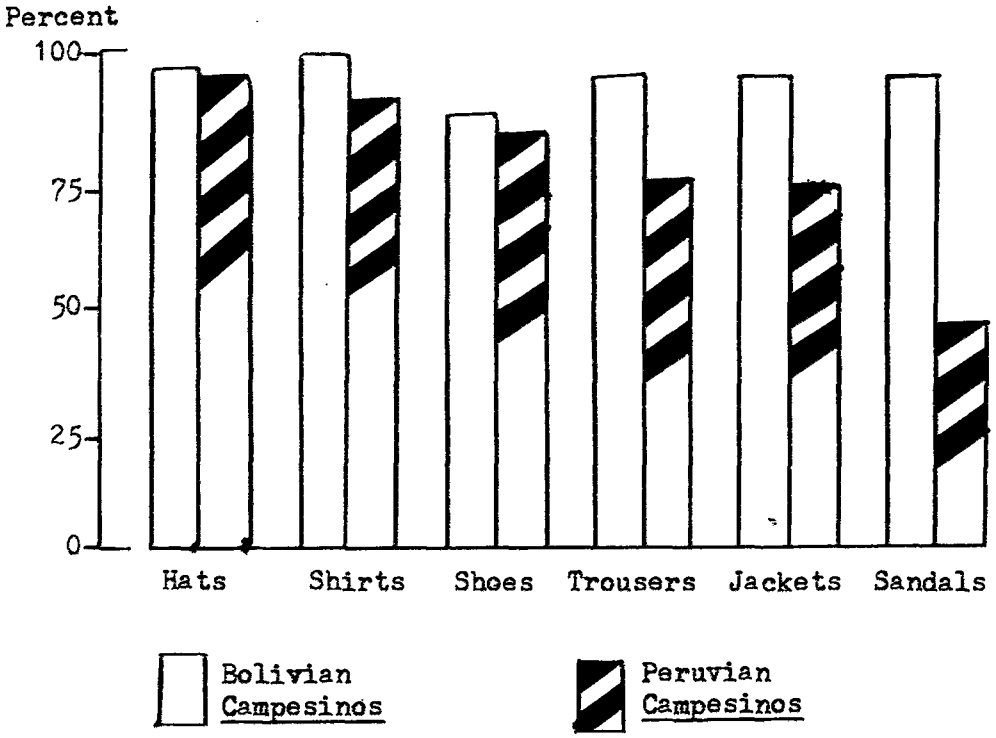


Figure 7.--Store-Bought Dry Goods Owned by Campesinos Interviewed

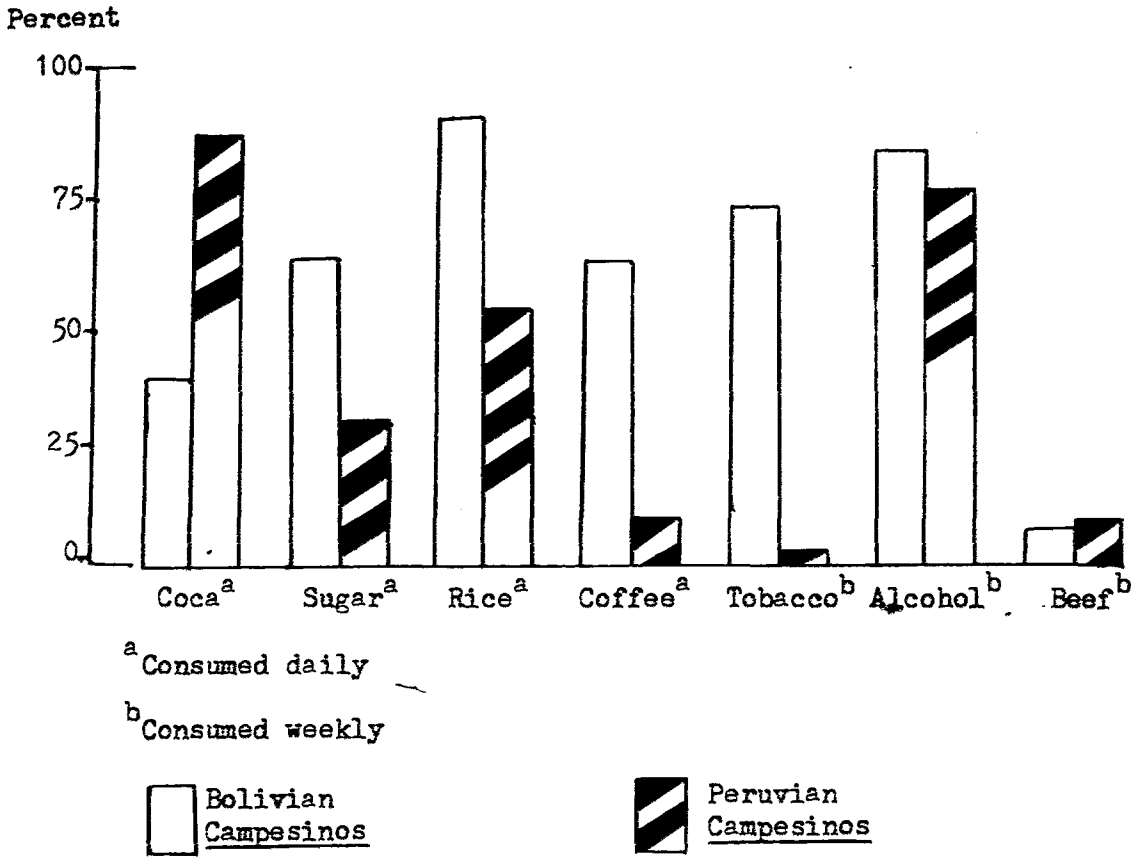


Figure 8.--Consumption of "Luxury" Foods and Stimulants of Campesinos Interviewed

livestock is the traditional campesino bank account. Also, although the evidence is not conclusive, it seems that durable goods and clothing are somewhat less expensive in Bolivia because of higher Peruvian import duties on such items and the greater distance of the Department of Puno from the main distribution centers in Peru. Coffee, tobacco, and similar agricultural produce is also grown in the Yungas region of Bolivia which borders the Altiplano, enabling the Bolivian campesinos to obtain these products at lower prices. Although a portion of this observed differential in campesino incomes and consumption can be explained by the different prices in the two sectors of the Region, the greater market activity, off-farm employment, and on-farm production of the Bolivian campesinos account for the greater part of their higher incomes and

standards of living. When the five hundred campesinos not interviewed are taken into consideration, the Bolivian ex-haciendas with half the land extension of the Peruvian haciendas provide a comparable living for four times as many campesinos. Consequently, the purchases and consumption of manufactured products typically used by campesinos is substantially greater on the Bolivian ex-haciendas than on the Peruvian haciendas.

2. Leisure and Education (Human Capital)

Because of the lesser demand for their labor, the Bolivian campesinos have greater leisure, which itself is a form of income. This leisure has permitted them to seek outside employment, to engage in political and social activity, and, most important of all, to educate themselves and their children. Approximately one out of every five Bolivian campesinos questioned had attended some type of adult education course since the agrarian reform, as compared to approximately one out of every fifteen Peruvian campesinos interviewed. Of all those who have attended or are attending school, 11% of the Bolivians achieved a level of primary (6 years) education while only 6% of the Peruvians did likewise. Of the adult populations--all those over 17 years of age--38% of the Bolivians attended school as compared to only 23% of the Peruvians. However, 60% of both the Bolivian and Peruvian school age children (6 to 17 years of age) are presently enrolled in some type of educational institution.[18] This is interesting inasmuch as two of the four Peruvian haciendas visited had no schools. Every Bolivian ex-hacienda had at

[18] In both sectors, the women are discriminated against and they are not given equal educational opportunities. See Appendix M for a breakdown of campesino education by age, sex, and school year.

least one school, and many of these were newly constructed. Also the teachers on the ex-haciendas were campesinos themselves whereas the Peruvian teachers were "blancos." As a result of this greater educational, marketing, and political activity the Bolivian campesinos were found to be less illiterate than their Peruvian neighbors.

TABLE 25

PERCENT ILLITERATE OVER 17 YEARS OF AGE

	Bolivian Campesinos Interviewed			Peruvian Campesinos Interviewed		
	Male	Female	Combined	Male	Female	Combined
Unable to speak Spanish	40	77	58	53	88	71
Unable to read and write Spanish	43	78	60	55	92	74
Unable to read, write, and speak Spanish	39	77	58	50	87	69

This increased education has led to a desire for even more. Of the campesinos interviewed by this writer, 82% of the Bolivians professed a desire that their children obtain a primary (6 years) or secondary (11 years) level of education as compared to a similar desire of only 69% of the Peruvians. This differential is also reflected in the occupational aspirations they have for their children. Twice as many of the Bolivian campesinos wanted their children to become professional men. On the other hand, three times as many Peruvian campesinos desired their children to become laborers. In their requests for economic aid, the Bolivians wanted more of all types of assistance than the Peruvians. However, whereas the

Peruvian campesinos interviewed wanted more land, the Bolivians expressed a wish for better land. Also significant is the fact that these Bolivian campesinos look to themselves and their families as the most probable future source of this economic assistance. Eighty-five percent of the Bolivian campesinos believed that either their unions, cooperatives, or families will enable them to obtain this aid in the future with 70% indicating the family as being the most likely source.

3. Supporting Evidence

Other studies of Peruvian haciendas and Bolivian ex-haciendas in the Region provide supporting evidence that the Bolivian campesinos receive larger total incomes than the Peruvian campesinos. For example, not all haciendas in the Peruvian sector of the Region are complying with the minimum wage decree of 1964. A sample study of haciendas in the Department of Puno, Peru, reports that fifteen of forty haciendas did not pay their campesinos a money wage. Of the remainder, four paid less than the minimum wage and only twenty-one complied with the law and paid a wage of 12 to 15 soles per day.[19] It is understandable that the first order of business of the newly-formed Peruvian sindicatos was to force these hacendados to comply with the wage law. Were it not for compulsory wage payments, the Peruvian campesinos would clearly earn a great deal less. Since this law has only been in existence a couple of years, the Bolivian campesinos, until very recently, had a much higher income in the Region than their Peruvian neighbors. Possibly, this was instrumental in bringing into existence the minimum wage law in the Department of Puno, Peru.

[19] Sample Study of Haciendas in the Department of Puno, Peru, passim.

The similarity of the Bolivian campesinos interviewed to others in the Lake Titicaca region was elaborated upon in the previous chapter. There is every reason to expect their income to approximate those of the campesinos investigated in the field study. It follows that if the income of the campesinos on other haciendas and ex-haciendas in the Region resemble those of the campesinos interviewed, their consumption would also be similar. In the aggregate, the greater per capita consumption by the Bolivian campesinos of manufactured and other products must be weighted by their greater numbers. It is also reasonable to expect the Bolivian campesinos in the Region to engage in social, political, and educational activity to a greater extent than the Peruvians. There exists some evidence to support this assumption. A sample study of fifty haciendas in the Department of Puno, Peru, found one-half of them have no schools, and half of the remainder are "deficient."[20] For the entire rural population of Puno it has been estimated that for the year 1963, 43% of the children between the ages of 5 and 14 were enrolled in school. This same source gives 71% as the rural illiteracy rate for all individuals over 17 years of age in the Department.[21] In the Bolivian sector, other ex-haciendas also have education and literacy rates similar to those found in the field study. For example, the Viacha study of eleven ex-haciendas found 46% of the adult campesinos unable to speak Spanish and 50% illiterate.[22] Both these studies lend support to the contention that the Bolivian campesinos in the Region are more literate than

[20] By law, the Peruvian haciendas are required to maintain a primary school if the number of school age children exceeds thirty. See Sample Study of Haciendas in the Department of Puno, Peru.

[21] Recursos Naturales del Departamento de Puno, pp. 25-26.

[22] Estudio Económico del Canton Viacha, passim.

the Peruvian campesinos and are more socially integrated into the nation as indicated by the greater percentage which speak Spanish, the official language. Other researchers in the Region have also found education to be permeating the Bolivian ex-haciendas. William Carter writes:

> The new roles of the syndicate leaders, particularly those of the secretary general and recording secretary, require these officials to be men with both a speaking and writing knowledge of Spanish. Since schools are a fairly recent innovation in the rural areas of the Altiplano and just about the only bilingual people are those who have attended formal classes, this requirement practically rules out the older men as candidates for places of authority. Thus, the very basis of qualification for leadership has been altered: youth has replaced age.[23]

The issue of whether or not education is related to the land tenure system will be discussed after an inquiry into the changes which have taken place in the Bolivian sector since the land reform of 1953.

4. The Effects of Land Reform

To what extent do these differences in campesino incomes, consumption, education, etc. reflect changes brought about by the Bolivian agrarian reform? On the Peruvian side of the border, the Bolivian land reform has probably indirectly given rise to higher campesino incomes and consumption inasmuch as it has been instrumental in bringing about the passage of the minimum wage and land reform laws. These decrees have reduced the campesino populations on the haciendas and made wage payments to those remaining compulsory, all of which has resulted in a higher income and standard of living for the remaining Peruvian campesinos. To an extent, this has resulted in a redistribution of income from the Peruvian hacendados to the campesinos. The greatest production cost of the haciendas today are wage payments, and prior to the 1964 minimum wage

[23]Carter, p. 59.

decree this cost was virtually nonexistent. It might be appropriate at this stage to comment upon the disposition of the incomes of the Peruvian hacendados and administrators. A very rough estimate of the economic profit of the four haciendas would be about $80,000. In addition, the administrators drew salaries totaling approximately $5,000. To the extent that these incomes and profits were spent or reinvested in the Region, they have contributed to its economy and progress. The administrators probably spent the greater part of their salaries in Puno, and this income and consumption of manufactured products should be added to that of the Peruvian campesinos. On the other hand, a portion of the recent investment in the haciendas was debt-financed as evidenced by the $25,000 they owe to local banks.[24] Apparently most of the hacendado economic profit was consumed or invested outside the Lake Titicaca region and possibly outside the nation. Large landowners everywhere in the world--and the Peruvians are no exception--are noted for their conspicuous consumption and socially questionable investment both in their native lands and abroad.[25]

Returning to an inquiry into the effects of the Bolivian land reform, to what extent has it been responsible for the higher campesino income, consumption of manufactured products, off-farm employment, and education observed in the Bolivian sector? The Bolivian campesino, who was previously shown to possess the same amount of land and livestock today as he did before the land reform, probably did not greatly increase the income earned from the output of his farm--except inasmuch as greater

[24] See Appendix L.

[25] And of course a substantial proportion of the $65,000 of foreign exchange obtained from the sale of wool was undoubtedly spent outside the country or inside the country on consumption-goods imports.

marketing activity and production of sub-products such as cheese, chuño, etc. have resulted in increased value received. However, because the Bolivian campesino is no longer required to herd the hacendado animals, work the owner's lands, or provide him with the obligatory personal services, he is now free to engage in off-farm economic activities which enables him to earn money income. Before 1953, the Bolivian hacendados, with very few exceptions, did not pay their campesinos a money wage. This newly acquired money income from increased marketing activity and outside employment has made it possible for the typical campesino family on an ex-hacienda to purchase manufactured products which were previously unattainable. Also, much of the income which previously accrued to the hacendados has been redistributed to the new influx of campesinos.[26] Whereas the hacendados before 1953 earned little foreign exchange because they exported very few of the hacienda products, they probably spent a portion of the foreign exchange earned by the mining industry since their propensity to consume imported products was undoubtedly higher than that of the campesinos. The campesinos spend a larger percentage of their incomes on products produced in Bolivia, such as clothing, food, and so forth. While it cannot be denied that the higher standard of living enjoyed by the campesinos is largely at the expense of the expropriated hacendados, neither can it be denied that the pre-reform higher standard of living enjoyed by the hacendados was largely at the expense of these

[26] As nearly as can be determined, the Bolivian hacendados were never officially compensated for their expropriated properties either in land elsewhere in the nation, in agrarian bonds, or in money. The only compensation given was in the form of land retained or non-official payments made by the campesinos themselves. Thirty-eight ex-hacendados questioned by mail claimed to have received no compensation from the government except of the type mentioned above.

same campesinos. It should also be remembered that most of these Bolivian haciendas were absentee owned and the landlords, for the most part, had principal occupations other than farming which presently provide them with a middle-class living.

But, it might be asked, does not the large number of Bolivian campesinos on these ex-haciendas constitute an immobilization of the labor force, thus constituting a growth retardant? The answer is negative inasmuch as the campesinos, who are now free agents, combine their leisure, on-farm labor, and off-farm labor in that combination which enables them to obtain the greatest satisfaction. Whenever off-farm employment opportunities are such that the campesinos can obtain a higher income and standard of living than the present combination, they are able, and will undoubtedly be willing, to leave the land to take advantage of these opportunities. As the situation now stands, the campesinos, as well as the nation, benefit by the greater employment provided by the more intensive use of the land in the Region today than existed before the agrarian reform.

Increased education and the literacy and skills which invariably result from such human investment have great potential as an economic growth stimulant. The human element has recently been emphasized by a few economists, notably Theodore W. Schultz of the University of Chicago. For example, he writes:

> But the key variable in explaining the differences in agriculture production is the human agent, i.e., the differences in the level of the acquired capabilities of farm people.[27]

To what extent do land tenure systems influence this type of human investment? The answer is obvious when it is remembered that the Peruvian

[27]Schultz, p. 17.

hacendados, like the Bolivian *hacendados* of yesteryear, are required by law to provide their *campesinos* with schools. Under a *latifundio* land tenure system, this is an expense which is not willingly undertaken. The cost of providing *campesinos* with these educational services are very real and current, but the benefits to the *hacendados*--if any--are intangible and remote. William H. Nicholls recognizes this problem when he writes:

> Increasingly the principle source for financing social overhead, the sociopolitically dominant landlord class will rarely be willing to tax itself in order to support such public services as education and agricultural extension.[28]

On the other hand, the Bolivian *campesino* on his small farm must allocate his and his family's labor and leisure time so as to maximize the present and future satisfaction of the family unit. Because of the low marginal productivity of labor resulting from the limited amount and traditional nature of the economic resources at his command, the *campesino* and especially his children experience enforced leisure. Being aware of the benefits to the individual of education, such as becoming a *sindicato* leader, it is rational behavior on their part to educate themselves and their children--especially if the State underwrites a large portion of the cost.[29] In contrast to the *hacendados*, the cost of education is nominal in both money and foregone opportunity, and the potential benefit great. In this respect, the land tenure system directly influences the investment in human beings.

[28] William H. Nicholls, "An Agricultural Surplus as a Factor in Economic Development," *Journal of Political Economy*, LXXI (February, 1963), 17.

[29] In Bolivia, the government pays the salaries of many of the rural school teachers and provides technical assistance for the construction of schools. In addition, Bolivia has no income or land tax.

> The growing emphasis on capital investments in human beings is one encouraging trend in current discussions of the mainsprings of economic growth. This emphasis is of primary importance to agricultural development. Improving the quality of the labor input through new knowledge and new skills offers one rewarding opportunity for agricultural capital investment. For this reason a major test of the performance of land tenure structures is to be found in the role they play in advancing capital investment in education.[30]

In the Bolivian sector of the Lake Titicaca region, education has greatly increased since the land reform of 1953. While many of the Bolivian haciendas had schools before the agrarian reform, this was largely due to the Supreme Decree of the 19th of August, 1936, which required latifundios with more than 25 campesino families to provide them with some minimum amount of education. However, as in Puno, Peru, today, many of the Bolivian hacendados did not comply with this law before 1953. For example, one-fourth of the thirty-five hacendados living in La Paz questioned by this writer admitted to having no schools on their properties prior to 1953. Also, the Bolivian Ministry of Agriculture Study of 1946 reported approximately one-fifth of the haciendas surveyed to be without schooling of any type. Those which had facilities for educating the campesino children were "deficient" inasmuch as only 11% of the school-age children were attending, the school buildings were inadequate, the teachers underpaid, and the quality of teaching "sub-standard."[31] This same report also pointed out that the campesinos were often required to pay the salaries of the teachers. The end product of this latifundio education system was an illiteracy rate which reached

[30] Raup, p. 13.

[31] Estudio Socio-Económico en las Provincias de Omasuyos, Ingavi y Los Andes, pp. 27-28. In all fairness, it should be mentioned that the campesino schools in Bolivia today are also "deficient" inasmuch as the buildings are still "inadequate" and much of the teaching is "sub-standard."

97% on some of these estates.[32] The Bolivian land reform may not be the sole factor responsible for the post-revolutionary surge in campesino education and literacy, but apparently the new land tenure system is more conducive to educating the campesinos than was the former.

In sum, the existing technology and traditional methods of production in the Lake Titicaca region have largely remained unchanged over the past thirteen years. Because the pre-reform Bolivian haciendas were largely agglomerations of small campesino farms, it is not surprising to discover that the new land tenure system is able to provide the nation with approximately the same agricultural output and surplus as the old latifundio system. In addition, the Bolivian campesinos not only have a higher per capita income today, but the same amount of land now supports between 25% and 50% more people than it did before the land reform. Insofar as the goal of the Bolivian land reform was to redistribute income, the attainment of this goal can be considered an increase in economic welfare, i.e., an increase in the psychic (satisfaction) income for the entire nation.

In Bolivia, where alternative employment is limited, this increase in marginal subsistence farming can be considered a net advantage in the short run. On the supply side of the labor market, the campesinos are not idle. Many are using their enforced leisure to seek off-farm employment and engage in social, political, and educational activities. Consequently, they are gradually becoming more mobile, literate, and integrated into the social, political, and economic life of the nation.

[32] Ibid.

The full impact of these changes will not be realized, however, until at least a few decades and perhaps generations have elapsed. One would expect these trends toward increased income, off-farm employment, consumption of manufactured products, education, literacy, etc. to continue. While all of this does not guarantee economic progress, it augars well for the future of the Lake Titicaca region and the Bolivian nation.

VIII. BOLIVIA'S OTHER AGRICULTURAL REGIONS AND POST-REVOLUTIONARY ECONOMY

The research on which this study is primarily based was carried on in the province of La Paz, Bolivia, and in the comparable province of Puno on the Peruvian side of Lake Titicaca. But the Bolivian land reform applied, at least nominally, to all the diverse agricultural regions of Bolivia. It is therefore necessary to turn to secondary materials to attempt to appraise the effects of the land reform in the other regions of the country, to examine the performance of Bolivian agriculture as a whole, and also to examine in still more cursory fashion the other aspects of the Bolivian economy with which the progress of its agriculture is necessarily linked. The purpose of this investigation is to give this analysis of the Bolivian land reform a national perspective.

A. Bolivia's Agricultural Regions

Bolivia is naturally divided into three broad physiographic areas: the Altiplano, comprising the high plateau and surrounding mountain ranges which constitute 16% of the superficial area of the country and which support approximately 50% of the nation's population; the Yungas-Valleys area of the eastern slopes of the Cordillera Real, comprising 14% of the nation's land and containing 30% of the national population; the Llanos (lowlands), great plains of the East which make up 70% of the national domain and wherein dwell the remaining 20% of the population. Figure 9 shows these three physiographic divisions further subdivided into a number of agricultural regions which differ in altitude, climate, soil, and therefore crop specialization. Each warrants separate consideration because of their uniqueness. The Lake Titicaca region,

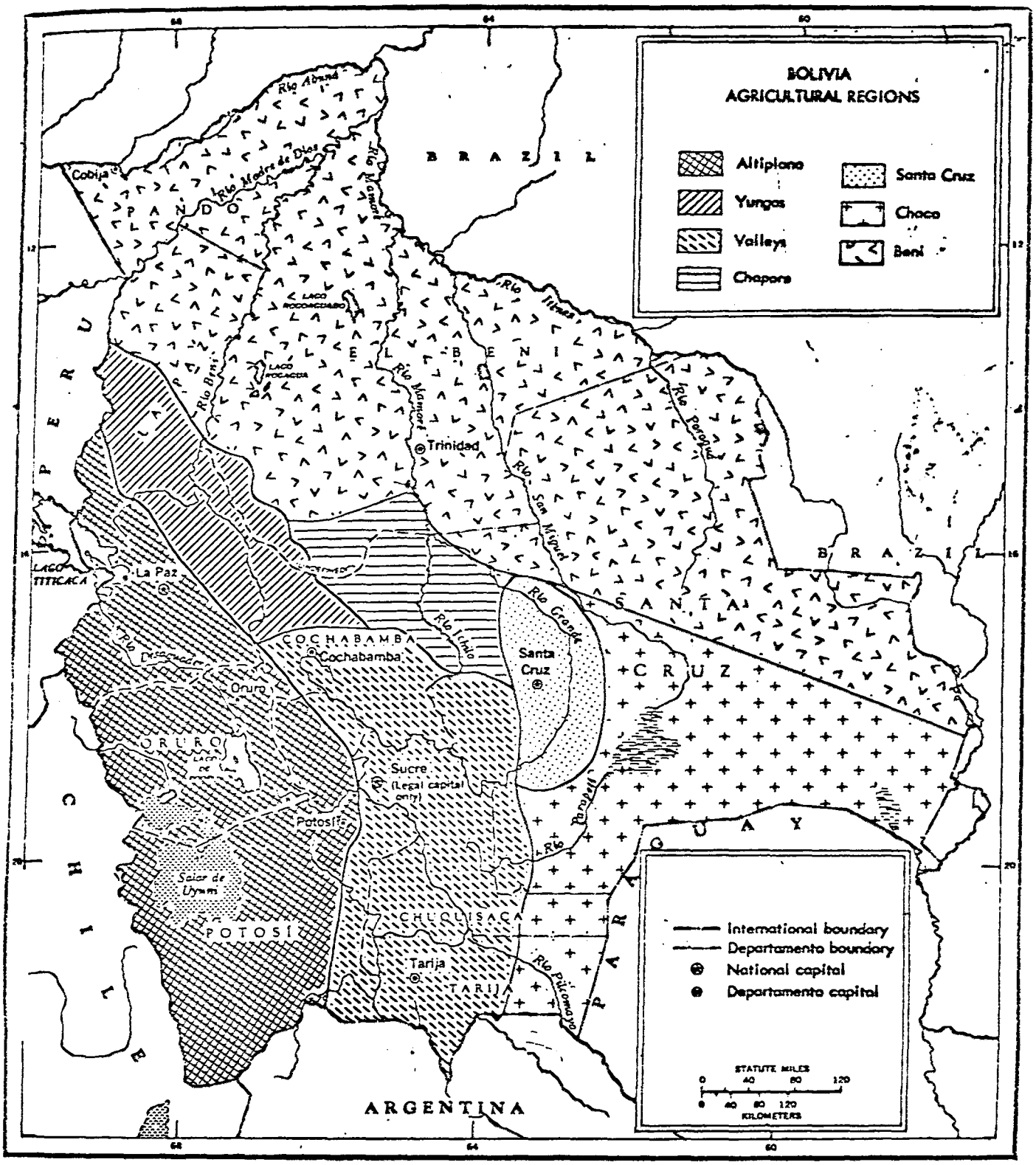


Figure 9.--Bolivia's Agricultural Regions

which lies within the Altiplano area, was examined in depth throughout this paper. The present task is to briefly investigate other agricultural regions in an attempt to discover the impact of the Bolivian land reform outside the Altiplano area of study.[1]

1. Yungas-Valleys

a. Yungas. The Yungas comprises the semi-tropical mountain-valley area north and northeast of La Paz. The elevation varies from 3,000 to 6,500 feet above sea level. The average annual temperature range is between 60° F. and 65° F., and the annual precipitation is approximately 55 to 75 inches.[2] The major agricultural crops are coca, fruit, coffee, vegetables, sugar-cane, and tobacco. However, coca is by far the most important cash crop and accounts for approximately 80% of the revenue derived from the sale of agricultural produce. The cultivation of coca on the steep slopes of these deep and narrow valleys has always necessitated a very intensive type of agricultural production. There has never been population pressure upon the land in this region. Labor, prior to the agrarian reform, was always somewhat scarce in the Yungas and thus often able to command a money wage.[3] Like the Altiplano, the Yungas prior

[1] Two very good studies of Bolivian ex-haciendas are, Estudios de Comunidades Bolivianas, Proyecto 208 del Programa de Cooperación Técnica, Union Panamericana y La Universidad Nacional Mayor de San Marcos (Lima, Peru, 1963) (Provisional), and Dwight B. Heath, et al., Land Reform and Social Revolution in Bolivia, The Land Tenure Center, University of Wisconsin (Madison, Wisconsin, 1965). (Unpublished.)

[2] Report of U. N. Mission of Technical Assistance to Bolivia, p. 51.

[3] This section on the Yungas relies heavily upon the research done by Madeline Barbara Leons of the University of Pittsburgh based upon a paper she presented in a Faculty Seminar entitled "The Role of Government in the Economic Development of Latin America," (Pittsburgh, 1966). (Unpublished.)

to 1953 was characterized by the latifundio land tenure system. However, the type of crops, topography, and land-population ratio had given rise to haciendas substantially smaller than those on the Altiplano. Also, the colonos on these landed estates produced a cash crop on their own lands in addition to their traditional subsistence crops. Because most of their labor time was obligated to the landowner, these campesinos typically utilized migratory labor from the overpopulated Altiplano on both their usufruct lands and those of the hacendado.

As on the Altiplano, the land was redistributed after the passage of the Decreto de la Reforma Agraria with only one notable difference. Because the population pressure was not acute in the Yungas, an attempt was made to preserve substantial portions of the "agricultural enterprises" and "medium properties." However, as on the Altiplano, the land was not redistributed in accordance with the provisions of the land reform law or the expedientes. A very unequal redistribution of the land has taken place and many campesinos are left with amounts of land corresponding to their pre-reform sayañas. Here, also, the land titles have not yet been fully distributed. Much of the land retained by the hacendados is lying idle due to their failure to return and work the land. One explanation for their inability to exploit these portions of their old estates is the reluctance of the campesinos to work for their former patrones. However, the greater number of these campesinos, augmented by an influx of laborers from the Altiplano, are intensively cultivating their small plots of land to such an extent that the output of coca, the major crop, has increased to its pre-reform level. Again, because of the labor and land intensive method of agricultural production of coca, it follows that agricultural efficiency has probably not decreased except that output per labor might have lessened. Agricultural surpluses have been at least

maintained and the income and consumption of the campesinos have probably increased. The campesinos, who before the land reform were active in the money economy, have undoubtedly increased their marketing activity in accordance with their increased output. One would expect they are more mobile since freed from the obligatory labor services on the hacienda, and the observed migration toward the Beni in the Lowlands is one manifestation of their greater mobility. Dwight B. Heath, an anthropologist of Brown University, attests to the increased political activity of the campesinos and their social integration into the nation.[4] There has, however, been no noticeable change in technology or capital accumulation with the exception of human capital (education). Since the agrarian reform, the number of schools in the Yungas has increased and a higher percentage of school-age children are attending school. Relative to before the agrarian reform, campesinos speak Spanish more often, and one can assume more of them are literate.

In many respects, therefore, the impact of the Bolivian land reform in the Yungas was similar to that on the Altiplano. Two other analogous situations are the failure of many of the campesino cooperatives and the virtually nonexistence of agricultural aid in the form of credit, extension services, etc. The one exception is the improvement of the road from La Paz to the Yungas and its extension into the Beni. All of this helps to explain why output has not greatly exceeded pre-reform levels inasmuch as the traditional methods of production have not been altered. The issue of agricultural assistance will be discussed in more depth after the section on Santa Cruz.

[4]Dwight B. Heath, "The Aymara Indians and Bolivia's Revolutions," preliminary draft of a paper read at the 64th annual meeting of American Anthropological Association (Denver, November 18, 1965). (Unpublished.)

b. Valleys. The sub-region of the Yungas, generally referred to as the Valleys, are located in the vicinity of Cochabamba, Sucre, and Tarija. The elevation of these semi-arid Mediterranean-type valleys is between 6,000 to 8,000 feet above sea level. The average annual temperature range is 60° F. to 65° F., and the mean annual rainfall varies from 18 to 24 inches. The major agricultural crops are corn, wheat, potatoes, barley, fruit, and vegetables. Corn is the most important cash and subsistence crop of the valleys, and it is used in the manufacture of chicha, the local alcoholic beverage. The major markets for these valleys are the cities of Cochabamba, Oruro, and La Paz. The valley of Cochabamba has long been known as the "granary of Bolivia." The Quechua Indians have inhabited these valleys since the time of the Incas, and, like the Lake Titicaca region, this area has a high population density. The pre-reform land tenure system of this agricultural region is best described as latifundio-minifundio. Apparently the relatively high fertility of the land and the population pressure upon the land combined to drive up the price of the land to the point where it was profitable for the hacendados to sell the marginal land of their estates to the campesinos.[5] Also, a few of these haciendas were apparently granjas (model farms) which were mechanized and used technologically sophisticated equipment. However, there were many latifundios which, because of the heavy density of population, were able to take advantage of the low cost of labor and operate in the traditional manner. Unlike the situation on the Altiplano or in the Yungas, the campesinos in the Valleys--especially Cochabamba--organized sindicatos prior to the Bolivian land reform. According to

[5]Olen E. Leonard claims that 50% of the families in the Cochabamba Valley were landowners in 1946. See Leonard, p. 120.

Richard W. Patch, an anthropologist and early observer of the Bolivian land reform, these campesinos redistributed the land of many of the haciendas prior to the Decree and in the process forced some of the provisions of the law upon the M. N. R. Government.[6] Only after much of the land had been redistributed by the campesinos themselves and the Decreto de la Reforma Agraria put into effect did the agrarian reform teams enter the region and attempt to put order into the redistribution and legalize the de facto land reform.[7] Consequently, the land was not redistributed in accordance with the provisions of the law and very likely the reverse had taken place; namely, the expedientes were drawn up in accordance with the actual extra-legal redistribution. Here, as elsewhere in the country, the land was unequally redistributed among the campesinos with many receiving only that land of their pre-reform sayañas. Also, titles have not yet been received for all the redistributed land.

The landowners retained portions of their estates if they were not legally declared latifundios, and this was the only form of compensation other than the private and not legally obligatory payments made by the campesinos to their former patróns. Although this writer has little knowledge of the economic situation of these ex-hacendado lands, there are indications that it is not lying idle. There are, for example, a number of medium-size dairy and grain farms operating in the Valleys. However, like all such farms in the country, they are experiencing difficulty in obtaining labor due to reluctance of the campesinos

[6]Patch, pp. 119-124.

[7]Apparently this is the agricultural region where much of the reported violence and destruction had taken place during 1952-1953.

to work others' lands since they now have their own land, off-farm employment opportunities, and colonization possibilities. Since the Bolivian land reform, the population density has increased and the smaller land-population ratio has necessitated more intensified methods of production. As a result, agricultural output of corn, vegetables, fruit, and potatoes has increased since the land reform, while the output of wheat and beef has lagged behind. At least this is the impression gained from conversation with Bolivian agronomists and American agricultural experts in the region. In the aggregate, however, the total agricultural output and surplus of the Valleys has exceeded pre-reform levels. Indeed, there are indications that the increased supply of corn has exceeded the increased demand. Prices have fallen and surpluses are being used for fodder. One must always keep in mind the competitive nature of Bolivia's agriculture, her small population, and the interrelationship of supply and demand when investigating the effect of land reform upon agricultural output. Thus, once again it appears that the decrease in average productivity per laborer has been more than offset by the increase in average productivity per hectare because now, with no appreciable change in technology or quantity of capital, more labor is combined with each unit of land input.

It follows from the above that the campesinos have increased their incomes and standards of living since 1953 for the same reasons elaborated upon elsewhere in this paper. There seems to be little doubt that the increased social, political,[8] and economic activity of the campesinos have greatly benefited them. An example of occupational and

[8]Anyone who has seen the armed sindicato militia in the Cochabamba Valley will attest to the revolutionary political awakening of these campesinos.

geographical mobility is the increased migration which has recently taken place to the eastern lowlands for both permanent colonization and seasonal employment in the sugar harvests and mills of both Bolivia and Argentina. This has, of course, been made possible by the completion of the hard-surface Cochabamba-Santa Cruz highway with economic assistance from the United States in the form of a loan to the Bolivian Development Corporation. Another major project of the Corporation was the milk-producing plant constructed near the city of Cochabamba. However, because most of the milk producers own medium-sized farms and are experiencing labor supply difficulties, this plant has been operating at substantially less than capacity since completion. Finally, the same revolution in education and literacy has occurred in this region. Also notable is the failure of numerous cooperatives set up immediately after the land reform.

While the Bolivian agricultural regions thus far considered are distinct, in many respects the impact of the land reform has been the same. This is the apparent pattern which is emerging from this brief investigation. However, as will soon become evident, the Lowlands agricultural region is the exception.

2. Lowlands (Santa Cruz and the Beni)

The remainder of the Bolivian nation is typically referred to as the Llanos (Lowlands) which are composed of the Gran Chaco, Santa Cruz, and Beni agricultural regions. The two most important are the Beni and Santa Cruz.

a. Beni. The northern tropical plains, commonly called the Beni, comprise approximately 50% of Bolivia and lie at an elevation between

500 and 1,500 feet above sea level. The climate is hot and humid with a mean annual temperature of about 90° F. The amount of land cultivated is very small, but the natural pastures support nearly a million semi-wild cattle.[9] Beef, then, is the major product which is sold in the city of La Paz and contraband markets in Brazil. The fact that the beef must be shipped to La Paz by air freight dramatically points out the single most pressing economic problem of this region; namely, isolation from the major consumption markets and lack of surface communication with these cities. Very little has been written about the land reform in the Beni because, for all practical purposes, there has been no land reform in this region. The size of many of the estates before 1953 were so large that their owners had no reliable knowledge of their landed extension or the number of cattle upon them. However, because there were no "land hungry" campesinos pressuring the government for redistribution and because the cities and mining camps needed the supply of beef, the application of the land reform to the Beni has been virtually nonexistent.[10] Since 1952, no roads have been constructed within the Beni or connecting her with the consumption centers on the Altiplano, although the Yungas-La Paz road is being slowly extended in that direction. Aside from the importation of a few breeding bulls and limited agricultural extension service, agricultural assistance has not been extensively applied to the region. Consequently, the economic stagnation, so characteristic of

[9]For an excellent summary of the history of the Beni, see Harold Osborne, Bolivia: A Land Divided, 3rd edition, revised (London, 1964), pp. 82-94.

[10]According to the Decree, much of the land of these latifundios must be redistributed. However, the land reform was apparently not intended for, relevant to, or even politically capable of application to the Lowlands since they never had any large population of sedentary Aymara or Quechua Indians on these vast plains.

this agricultural region prior to 1953, has not been altered. This is confirmed by a study of the Bolivian livestock industry. In 1950, the Department of Beni produced 20,385 metric tons of beef and exported 8,300 tons primarily to the city of La Paz. In 1958, the output was 20,798 metric tons, of which 10,138 were sold outside the Department.[11] The economic stagnation which existed prior to 1953 has not changed since that time, and the future economic prospects for the Beni are bleak. While it is true that the agricultural output of the Altiplano and Yungas has not greatly exceeded pre-reform levels, the increased campesino freedom, mobility, economic security, etc. portend well for the future of these regions. Contrasted with this prospect, a combination of natural disasters, economic stagnation, and the land tenure system in the Beni during the decade 1952-1962 has given rise to depletion of the population in the countryside, unemployment in the towns, and lower wages and rising prices.[12] These forces may give rise to an out-migration rather than the desired in-migration. The Bolivian land reform is certainly not responsible for the economic problems in the Beni and should possibly be given consideration, along with improved communications and agricultural assistance, as plausible solutions.

b. Santa Cruz. Santa Cruz, the other Lowland agricultural region, is the heavily timbered subtropical plain which lies in the eastern part of the country at an elevation between 1,000 to 1,500 feet above sea level. The climate is similar to that of the Beni and other Lowland areas with the added advantage of a rich top-soil. Although much of this region is

[11] La Producción Ganadera, Table 11, Nos. 1 and 2.

[12] Osborne, Bolivia: A Land Divided, p. 92.

suited to the grazing of livestock, cultivation of sugar-cane, rice, fruit, and oil plants dominates the agricultural industry.[13] The traditional slash-and-burn type of cultivation is practiced in this region. Under a system of land rotation, the newly cleared land is cultivated for four to eight years and then allowed to rest for eight to ten years to allow the soil to recover its fertility. In at least two ways, the Santa Cruz region resembled the Beni prior to 1952. Neither was connected with its major domestic markets and the effect of this upon their regional economies was identical.[14] Economic stagnation, low population-land ratio, and low agricultural output relative to potential were characteristic of the Santa Cruz region. Thus, like the situation in the Beni, land reform was not an issue in Santa Cruz nor--to the knowledge of this writer--did any substantial redistribution of land take place after 1953.

But unlike the Beni, or any other of the nation's agricultural regions, Santa Cruz has been the recipient of substantial technical and economic assistance from the Bolivian and United States governments, as well as numerous international organizations. Long recognized as a potentially productive agricultural region, Santa Cruz was, nevertheless, largely neglected until the National Revolution of 1952. One of the major aims of the M. N. R. Government's Economic Diversification Plan was to reduce imports of cotton, sugar, rice, and other food products. Because the Santa Cruz region was capable of supplying the domestic

[13] Corn, yucca, and vegetables are also grown for subsistence. In addition, some cattle and other livestock are raised.

[14] See Osborne, Bolivia: A Land Divided, pp. 94-101 for an historical note on the isolation of the Santa Cruz region as a result of the construction of railroads linking La Paz to the outside world.

market with these foods, the main efforts of the Bolivian Development Corporation and the Interamerican Agricultural Service, a division of the United States Operations Mission in Bolivia, have been concentrated in this agricultural region. Hard-surface highways have been constructed from Cochabamba to Santa Cruz and from Santa Cruz to Monetro and elsewhere. Sugar mills, irrigation projects, and agricultural extension stations have been completed. Seed, fertilizer, agricultural equipment, and credit have also been made available at or below cost.[15] As a result of this stimulation, reinforced by sponsored and spontaneous colonization, production of sugar, rice, cotton, corn, yucca, etc. has increased tremendously since 1952.[16] It should be pointed out that the policy of developing Santa Cruz and constructing the Cochabamba-Santa Cruz highway had been accepted in principle by a series of Bolivian governments since the early 1940's. It was only a coincidence that the road, begun much earlier, was completed under the M. N. R. Government.

While the Bolivian land reform did not cause any large scale land redistribution in the Santa Cruz region, the Decree combined with U. S. economic aid did alter the land tenure system. Prior to 1953, most of the large landowners in the region did not have legal titles to their lands, were not mechanized, and cultivated only a small fraction of their holdings with the use of tenant laborers. Because they feared losing their lands and because it was profitable, these hacendados made use of the subsidized credit and agricultural equipment to clear their land of both trees and tenant laborers and engage in commercial farming of rice, sugar-cane, and other crops. In so doing they qualified as

[15] Ibid., pp. 100-101.

[16] See pages 142-45 of this paper for increased output and decreased imports of these crops since the 1952 revolution.

"agricultural enterprises" under Article 17 of the Decreto de la Reforma Agraria and were able to obtain title to a legal maximum of 2,000 hectares. The displaced tenant laborers colonized virgin land made available by the construction of roads in the area. In this manner the latifundios of Santa Cruz were converted to commercial enterprises, and the tenant laborers changed to small landowners. However, small scale subsistence farming is undoubtedly still a basic feature of the economy of the Santa Cruz region.

Thus, while it is true that the one region in the country probably least directly affected by the Bolivian land reform has experienced the greatest increase in agricultural production, it is also the region which has been the beneficiary of the bulk of economic assistance. The future of Santa Cruz, in the words of C. H. Zondag, is "great hopes surrounded by uncertainty."[17] The element of uncertainty arises from the existing and potential problems of soil management, high cost of labor, and marketing. The tropical soil of Santa Cruz will probably not be able to maintain or increase its present productivity without irrigation, fertilizer, and general soil management. Eventually the slash-and-burn agriculture must be supplanted or else the weak tropical soils will lose their fertility, turn sour, and erode. Immigration in the area must increase to lower the cost of production and prices to a level commensurate with world market prices. Lowering production costs is especially imperative since the present subsidization of agriculture in Santa Cruz cannot be maintained indefinitely. Finally, the great distances between Santa Cruz and the main consumption markets on the Altiplano require not

[17] C. H. Zondag, International Cooperation Administration, Problems in the Economic Development of Bolivia (La Paz, 1956). (Mimeographed.)

only lower production costs but lower transportation costs if a truly free market demand is to be established for the agricultural surplus of Santa Cruz. Zondag had this to say about Santa Cruz in 1956, much of which holds true today:

> Thus for the time being, Santa Cruz is forced to resort to a rather high cost mechanized agriculture which contrasts even more with the low purchasing power of the people to whom this production should go, i.e., the masses on the high plains.[18]

B. Foreign Economic Assistance to Bolivia

It is evident from the above that any discussion of Bolivia's land reform, agrarian sector, or national economy would be incomplete if it ignored the impact of the foreign technical and economic assistance disbursed to Bolivia between 1952 and 1965. Bolivia has received this aid from international organizations such as the International Monetary Fund and the United Nations, as well as from individual nations such as Germany and the United States. However, the United States aid program is by far the largest and most important. For this reason, most of this discussion will center on the U. S. aid program. Much of what is said about this bilateral aid program also applies to the others.

Immediately following the national revolution, Bolivia began experiencing a number of economic difficulties. Aggregate output decreased, inflation increased, and the national budget and balance-of-payments deficits increased accordingly. Many of these economic problems had their origins in pre-revolutionary Bolivia, some resulted from foreign influences, while still others were caused by economic policies

[18] Ibid., p. 90.

of the M. N. R. Government of Bolivia. It is impossible to neatly separate the effect of these three contributors to the economic crisis of Bolivia during the 1950's. For example, inflation, unbalanced budgets, multiple exchange rates, high-cost tin mining, and inefficient and stagnant agriculture were inherited by the Revolutionary Government. However, the nationalization of the mines, subsidization of the miners and manufacturers, and the redistribution of the land played a significant part in bringing about the post-revolutionary economic crisis. Finally, the drop in world tin prices, combined with the above, made it imperative that Bolivia seek and receive outside help to prevent an economic, social and political collapse which threatened the existence of the nation. The United States Government, for the usual political, economic, and humanitarian reasons, disbursed to Bolivia millions of dollars in grants and loans from 1952 to 1965. Economic aid grants and direct gifts of food, fibers, machinery, and cash are the largest and most important. The wheat, flour, dried milk, cotton, etc. provided under the economic aid program are sold in Bolivia, and the Government uses this domestic money to finance development projects, such as the construction of roads, irrigation works, sugar refineries, colonization projects, schools, etc. Technical assistance dollar grants are roughly matched by national currency grants by the Bolivian Government and used to provide the nation with various agricultural, educational, health, and transportation services.[19] In addition, Bolivia has received a number of developmental and stabilization loans.

[19] The United States International Cooperative Administration manages the aid programs in Bolivia. Most of the health, education, and transportation programs are--at least theoretically carried out jointly with the Bolivian government. Some programs, such as the Servicio Agrícola Interamericano (agricultural extension), have been turned over to the responsible ministries in the government.

TABLE 26

UNITED STATES ECONOMIC AND TECHNICAL ASSISTANCE DISBURSED TO BOLIVIA, 1952-1965 (in millions of dollars)

Fiscal Year	GRANTS: Technical Assistance	GRANTS: Economic Aid	GRANTS: Total	CREDITS	TOTAL
1952	0.7	-	0.7	5.3	6.0
1953	1.3	0.2	1.5	3.4	4.9
1954	2.9	7.9	10.8	1.7	12.5
1955	1.8	14.1	15.9	1.1	17.0
1956	2.0	16.1	18.1	3.9	22.0
1957	2.9	20.3	23.2	1.0	24.2
1958	3.4	28.7	32.1	-	32.1
1959	3.0	19.7	22.7	0.8	23.5
1960	2.8	13.4	16.2	1.6	17.8
1961	1.8	14.8	16.6	0.3	16.9
1962	2.0	23.6	25.6	2.4	28.0
1963	7.0	25.0	32.0	4.2	36.2
1964	6.8	39.3[a]	46.1	11.5	57.6
1965	5.2	11.6	16.8	6.0	22.8

[a]Includes fiscal year 1964 and all prior years of aid moneys disbursed under Title III of Public Law 480. Total = $8.7 million.

Sources: Data for fiscal years 1952-1959 from Foreign Grants and Credits by the United States Government and the International Cooperation Administration as cited by Richard W. Patch in "Bolivia: U. S. Assistance in a Revolutionary Setting," in Richard N. Adams, et. al., Social Change in Latin America Today (New York: Vintage Books, 1961), Table 1, p. 152. Data for fiscal years 1960-1965 from Economic and Program Statistics, United States Agency for International Development, Bolivia (La Paz, 1965), Table 1, pp. 31-32.

A substantial amount of this economic aid was--and is being--used to provide Bolivia with food supplies as well as develop her agriculture to reduce future imports of food and fiber, which she is capable of producing domestically. The aid program has been severely criticized by both Bolivians and Americans inside and outside their respective governments. Nearly everyone who has written on post-revolutionary Bolivia has seen

fit to criticize the U. S. aid program.[20] It is difficult to imagine how Bolivia could have managed during those trying days without the financial, technical, and other economic assistance from the United Nations, the United States, and others. The purpose of the following brief examination of U. S. económic aid to Bolivia, as it relates to agriculture, is not to praise or criticize the program, however, but rather to make clear the influence these projects have had upon the nation's campesinos.

The aid grants of wheat, flour, edible oils, dehydrated milk, and other foods have almost exclusively been sold to the city and mining camp populations. Bread is still considered a luxury to the Altiplano campesino. It is impossible to determine the effect of these food gifts upon the production of quinua, wheat, maize, yucca, and other potential substitutes for imported wheat and flour. More significant is the orientation of the agricultural development projects, extension services, credit, and other similar forms of aid. Most of this benefits the large agricultural farms of the Valleys and the Lowlands which are, for the most part, owned by Spanish-speaking Bolivians. It is these large farms producing the sugar, cotton, rice, and milk which are the beneficiaries of the seed, fertilizer, agricultural equipment, credit, irrigation and land clearing projects, sugar mills, and milk processing plants financed by U. S. aid grants and loans. Of course, one recognizes that priorities must be established and there are valid economic arguments for directing the aid to these peoples, regions, and projects. Nevertheless, this does not detract from the fact that the mass of the nation's campesinos receive very little, if any, benefit from U. S. aid as a consequence of this

[20] For example, see the articles by Richard W. Patch and Antonio García previously referred to in this paper.

particular orientation.[21] In light of these facts, it is not surprising that agricultural efficiency and output have made the greatest gains in those regions and crops which have received the most economic aid and technical assistance. From the point of view of the nation's campesinos and the land reform program this is unfortunate inasmuch as these are precisely the regions where land reform has had only a moderate impact and where small numbers of campesinos reside. The aid projects are also directed toward increasing the output of those crops which the campesinos do not now produce nor will produce in the foreseeable future. Throughout the present chapter and the two previous ones, the Bolivian campesinos in the Altiplano and Yungas agricultural regions were seen to be capable of increasing the output of beef, potatoes, corn, etc. to pre-reform levels with virtually no technical assistance or economic aid. It might be that these levels of output are some type of traditional optima which cannot be exceeded except by altering the traditional inputs of land, labor, capital, and method of production. This can only be accomplished by infusing these traditional agricultural regions with extensive technical assistance and other forms of economic aid. It might be well for the administrators of U. S. aid to bear in mind that the campesinos, who account for nearly three-fourths of the nation's population, are least capable of self-help, would benefit most from economic assistance, and would probably be most appreciative of any help received. They are also the group which holds the greatest promise for the creation of a truly mass consumption economy. For, most observers of the Bolivian scene

[21] Two exceptions are the United Nations' Misión Andina and the United States' Bolivian Desarrollo de la Comunidad programs which are directed toward the campesinos. However, relative to the overall aid program, they are insignificant.

recognize that these campesinos are the future of Bolivia. As Patch has said,

> Finally, and urgently, the United States must dramatize its friendly purposes to the campesinos who, having emerged from four hundred years of serfdom, now hold Bolivia's future in their hands.[22]

C. Bolivia's Post-Revolutionary Economy

Bolivia, today, is still an underdeveloped nation in every sense of the word. As in the pre-reform era, the Bolivian dual economy today exports minerals and imports food which is not yet being produced in sufficient quantity by her agrarian sector. The great institutional changes such as land reform and the nationalization of the mines have thus far failed to radically modify the Bolivian economy. This does not imply that no progress has been made in integrating the agricultural and non-agricultural sectors, decreasing food imports, or altering the traditional agriculture of Bolivia. Rather, these remarks on the post-revolutionary Bolivian economy simply indicate the relatively modest progress which has been made since 1952 to overcome the enormous and complex economic problems responsible for the stagnation and backwardness of Bolivia's economy during the previous several decades. This section will briefly examine the performance of the post-revolutionary Bolivian economy and an attempt will be made to explain the progress, as well as the lack of progress, which has been made in various sectors of the economy.

1. Agriculture

As one would expect, a number of profound changes have taken place in the agrarian sector of Bolivia since the last agriculture census of

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[22] Patch, p. 176.

1950. The Bolivian land reform has given rise to a different land-use pattern. The redistribution of the latifundios into small campesino farms has given rise to a more intensive use of the arable land. This difference is revealed in a comparison of 86,377 sampled agricultural units in 1950 with 451,950 units in 1963.

TABLE 27

USE OF THE LAND IN AGRICULTURAL UNITS SAMPLED IN 1950 AND 1963

Land Use	1950 Hectares	Percent of Total	1963 Hectares	Percent of Total
Total Land Area	32,749,850	100.0	7,842,044	100.0
Cultivated Land	654,259	2.0	1,093,685	14.0
Land in Rest	2,437,166	7.5	348,340	4.4
Other Land	29,658,425	90.5	6,400,019	81.6

Source: Bolivia: División de Estudios Económicos y Estadística, Ministerio de Agricultura Aprovechamiento de la Tierra en las Unidades Censales Años 1950, 1963. (La Paz, April, 1966).

It is interesting to note that of the 32,749,850 hectares surveyed in 1950, only 6,278,803 or 19% of this amount had been legally redistributed to individual campesinos by 1966. Of course, many expedientes are still being processed and a number of haciendas were illegally expropriated by the campesinos. Nevertheless, these figures reaffirm the fact that the agrarian reform was not universally applied throughout Bolivia, nor were all hacienda lands redistributed. Because the most populated agricultural areas of the nation, such as the Cochabamba Valley and the Lake Titicaca region, were greatly modified by the land redistribution, most of Bolivia's agricultural population was directly affected. The impact of the Bolivian land reform on the production and productivity

of the subsistence crops grown by the nation's campesinos is only just beginning to be felt. In this brief investigation of Bolivian agriculture, it will soon become evident that at the national level land redistribution only partially explains the changes which have taken place since 1952. The U. S. aid program, lowland haciendas and colonies, and a history of agricultural lethargy share responsibility for the post-revolution economic performance of Bolivia's agrarian sector.

Since 1950, Bolivian agricultural output and land productivity in general have increased. However, the progress has been moderate and in many subsistence crops the rate of increase has probably not exceeded that of the previous several decades.

TABLE 28

AGRICULTURAL PRODUCTION AND PRODUCTIVITY INDICES FOR MAJOR CROPS, 1958 AND 1964 (1950 = 100)[a]

	Area Under Cultivation		Output		Output Per Hectare	
	1958	1964	1958	1964	1958	1964
Potatoes	99	127	297	381	299	299
Corn (grain)	186	175	219	204	117	117
Wheat	109	148	136	174	125	118
Barley (grain)	195	298	148	295	76	98
Quinua	86	120	154	178	180	148
Rice	124	183	89	154	72	85
Sugar	173	300	180	350	105	117
Coffee	141	443	-	280	-	61

[a]See Table 3, page 19 of this paper for absolute figures on production and productivity during 1950.

Sources: Bolivia: Oficina Nacional de Estadística y Censos, Censo Nacional Agropecuario de 1950, Ministerio de Agricultura, Estadísticas Agropecurios Año Agrícola 1957-58 (La Paz, 1961). Data for years 1963 and 1964 were obtained from La División de Estudios Económicos y Estadística, Ministerio de Agricultura in La Paz, Bolivia, on May 12, 1966.

Table 28 above provides a comparison of production and productivity data from the Bolivian agricultural census of 1950, the sample study of 1958, and the official governmental estimates for 1964. Indices are used with 1950 as the base year to facilitate comparison. This growth in Bolivian agricultural output since 1950 can be largely accounted for by the increased traditional inputs of land and labor. Tables 27 and 28 both indicate that the land area under cultivation has nearly doubled since the 1950 agriculture census. It has also been estimated that the rural population has increased by approximately 20% during this same period.[23] It is questionable, however, whether output per unit of labor has decreased. The campesino farm is both a source of income and place of residence from which he ventures to earn off-farm income. More statistical evidence is needed to ascertain whether in fact output per man-hour input has decreased.

According to the sources above, the number of livestock in Bolivia has also increased during the time period 1950 to 1963. The Department of Agriculture estimates that there were 20% more cattle, 28% more pigs, and 42% more fowl in Bolivia in 1963 than there were in 1950. Only the stock of sheep has decreased to 84% of that which existed at the time of the 1950 agricultural census. To an extent, this is verified by a study of the Bolivian meat industry. According to this study, national output of beef in 1950 was 62,300 metric tons, which increased to 74,466 metric tons by 1963. Pork production increased during this time period from 12,200 to 14,536 metric tons.[24]

[23] Economic and Program Statistics, Table IV, p. 7.

[24] La Producción Ganadera, Table 7.

There has been a reduction of food imports as a percentage of total imports since 1950. By 1964, it is estimated that less than one-fifth of the value of all imports were foodstuffs as compared to nearly one-half before the revolution. However, the U. S. aid program deserves more credit for this than the Bolivian land reform or any other factor. The subsidized development of the Santa Cruz region had, by 1964, reduced Bolivia's dependency on foreign food supplies. Indices for the major agricultural imports from 1950 to 1964 are set forth in Table 29.

TABLE 29

INDICES OF PRINCIPAL AGRICULTURAL IMPORTS FROM 1950 TO 1964
(1950 = 100)

	Wheat	Wheat Flour	Lard	Sugar (white)	Rice	Live Cattle
1950[a]	100	100	100	100	100	100
1951	81	189	159	118	119	102
1952	199	94	138	90	130	131
1953	214	64	154	140	104	140
1954	171	111	151	136	161	48
1955	122	126	139	116	131	241
1956	52	85	91	112	68	327
1957	173	362	280	181	139	167
1958	12	373	358	91	137	45
1959	38	413	258	125	104	5
1960	-	446	298	70	28	2
1961	14	583	429	53	52	18
1962	58	543	405	55	100	-[b]
1963	49	592	479	22	3	-[b]
1964	12	552	449	0	0	6

[a]In absolute figures, Bolivia imported 33,881 metric tons of wheat (grain), 17,399 metric tons of wheat flour, 1,882 metric tons of lard, 36,824 metric tons of sugar (white), 8,211 metric tons of rice, and 8,328 cattle.

[b]Data not available.

Sources: Bolivia, Dirección General de Estadística y Censos, Ministerio de Hacienda, Boletín Estadístico, Annual Issues 1950-1964.

Since imports of wheat and wheat flour still account for approximately a third of the value of agricultural imports, perhaps a comparable aid program is needed to increase Bolivia's grain production. Wheat and wheat substitutes, such as rye, barley, and quinua, are grown in various regions of the country, including the Altiplano.

In general, and aside from the limitations of the data, these national agricultural output and productivity figures confirm much of what has previously been said in this paper. The impact of the U. S. aid on Bolivian agriculture is clearly seen in the decreased imports of rice and sugar, which were two subsidized commercial crops of the Santa Cruz region. With respect to livestock, the pig and fowl population increases have exceeded that of cattle, while the sheep herd has diminished. This is consistant with the changes which have taken place on the Altiplano and in the Beni. In addition, the production and productivity statistics of the typical subsistence crops reveal the increased land and labor in agriculture made possible in part by the land redistribution. Finally, as before the land reform, lack of capital and modern technology have limited the growth of Bolivia's agricultural supply during the previous decade. In addition, it will be seen below that the non-agricultural sector of the economy has not been growing fast enough to absorb the surplus labor made available by the Bolivian land reform, to increase the demand for many of the nation's food products, or to provide the agrarian sector with investment or consumption goods.

2. Mining

It is still the mining sector which earns the foreign exchange which makes it possible for the nation to import food, raw materials, and manufactured goods. Metal exports during the previous thirteen years

accounted for between 90% and 95% of the total value of Bolivia's exports, while tin exports made up 60% to 75% of all metal exports. In this respect Bolivia's resemblance to a mining camp has been unaltered. Today, it is a quasi-public mining camp since the three largest mining companies of Patiño, Hochschild, and Aramayo were nationalized immediately after the M. N. R. revolution. The government mining corporation, Corporación Minera de Bolivia, or COMIBOL for short, has experienced a number of difficulties since 1952 in operating these large mines. The numerous problems associated with the nationalization process, such as compensation to the former owners, early labor difficulties, and the corporation's inability to obtain working and replacement capital, will only be briefly commented upon.

Just as the land reform did not redistribute all the hacienda lands, the nationalization of the three largest mining companies left a substantial part of the industry in private hands. However, unlike the landowners of the expropriated haciendas, the former owners of the nationalized mines are being compensated. Within a few years after the nationalization, Bolivian engineers and technicians were found to replace the large numbers of foreigners who left the country. The early favoritism shown to the miners, who were the soldiers of the revolution, was terminated and it is generally conceded that "labor discipline" has in recent years been restored. However, the influence of world demand and thus the price of metals upon the Bolivian mining industry has probably been as great as the nationalization program. For example, it has been estimated by the then-President of Bolivia, Paz Estenssoro, that each 1¢ drop in the price of tin represents a $600,000 to $700,000 drop in the foreign exchange earnings of Boliva. The price of tin dropped by 29¢ from 1952

to 1954 and the unfavorable multiple effect of this decrease in metal earnings must have been enormous.[25] As Table 30 reveals, the price of tin has recovered somewhat since 1954, but it was only until 1964 that the world price of tin exceeded its 1952 level.

TABLE 30

INDICES OF TIN AND OTHER METAL EXPORTS FROM 1952 TO 1964
(1950 = 100)

	Tin Exports			Total Metal Exports	
Year	Quantity	Value	Price	Quantity	Value
1952[a]	100	100	100	100	100
1953	109	85	80	82	80
1954	86	65	75	67	69
1955	87	68	77	71	71
1956	84	70	84	68	73
1957	87	68	79	73	64
1958	56	43	85	54	41
1959	75	62	87	49	50
1960	61	51	86	46	44
1961	64	59	96	51	50
1962	67	64	97	52	51
1963	71	68	98	58	59
1964	75	96	131	66	78

[a]In absolute figures, Bolivia exported 121,206 fine metric tons of all metals valued at $137,754,000. Of this amount, 32,471 fine metric tons was tin valued at $84,783,000. The price of a fine pound of tin in 1952 was $1.17.

Source: Bolivia, Banco Central de Bolivia, Sección Estudios Económicos y Estadística, Boletín Estadística, #173, December, 1965, pp. 44-46.

[25]Other metal prices also decreased during this period. The average price of wolfram from 1953 to 1964 was only 43% of the 1952 price. The prices of zinc and lead, two other principal metals, also decreased by 20% to 25% during this time.

Because Bolivia is a high-cost producer of tin and other metals, and because she must import the capital equipment used in mining, decreases in the world demand for metals results in decreased national output. Perhaps this dependency upon foreign demand helps explain why the foreign mine owners were compensated and the Bolivian landowners were not. It also partially explains Bolivia's drive toward economic diversification. However, both these changes in international demand for and domestic supply of metals since 1952 help to explain the inability of the Bolivian mining sector to increase output and foreign exchange earnings. Consequently, Bolivia's capacity to import capital goods and to provide alternative employment opportunities for the nation's campesinos have not been augmented by the growth performance of her other major economic sector.[26]

3. Manufacturing

Although the manufacturing sector of the Bolivian economy never was a major employer of labor or a generator of national income, it warrants consideration because of its potential role in the future. The Bolivian land reform provided the manufacturing industry with a unique opportunity to expand. On the supply side, it freed the campesinos from the restrictions of the latifundio land tenure system and made available an abundant and cheap supply of labor. On the demand side, the land reform has created an agrarian mass consumption demand for manufactured products capable of domestic production. Unfortunately the manufacturing sector has thus far not taken advantage of this new situation. For example, in Table 31 it is clearly seen that manufacturing has not yet

[26]See Appendix N for a very brief discussion of Bolivia's petroleum industry whose remarkable growth during the previous decade has slowed up in recent years.

attained its pre-revolutionary level of output in a number of principal products. In addition, this industry has shown no intention of producing or even assembling the new products demanded by the campesinos, such as bicycles, transistor radios, and even inexpensive woolen clothing.

TABLE 31

PRODUCTION INDICES OF BOLIVIA'S PRINCIPAL MANUFACTURERS: 1950-1964
(1950 = 100)

	Cotton Cloth	Wool Cloth	Wheat Flour	Beer	Cigarettes	Soap	Cement
1950[a]	100	100	100	100	100	100	100
1951	118	81	107	112	98	90	103
1952	126	78	116	109	91	49	98
1953	82	78	150	106	80	60	89
1954	91	89	135	104	81	76	87
1955	131	97	143	80	85	89	98
1956	143	85	145	81	74	81	87
1957	127	76	87	71	46	46	62
1958	114	57	48	72	54	29	76
1959	117	53	35	61	57	41	77
1960	125	57	15	64	59	46	105
1961	132	42	13	73	62	59	119
1962	124	52	17	79	60	83	130
1963	132	57	25	86	65	82	153
1964	134	54	36	97	145	29	171

[a]In absolute figures, Bolivia produced 7,239,122 meters of cotton cloth, 1,611,967 meters of wool cloth, 39,230 metric tons of wheat flour, 27,327,427 liters of beer, 3,790,644 packages of cigarettes, 1,986,004 kilos of soap, and 38,126 metric tons of cement in 1950.

Source: Bolivia: Ministerio de Hacienda, Dirección General de Estadística y Censos Boletín Estadístico, No. 89, pp. 64-65, and No. 90, pp. 82-83.

This poor performance can be partially explained by the effect of the disruptive 1950's upon this infant industry. During this time the import-export business was stimulated by the functioning of the multiple exchange rate system then in effect. Manufacturers engaged in

international trade since it became very profitable to import raw materials at artificially low exchange rates and export them at the much higher free market rate. The government's currency stabilization program of 1957 was even more disastrous for the manufacturing industry. During this attempt to curb inflation, wages and employment were fixed and the exchange rate was permitted to seek its true market level for imports. This had the effect of destroying the lucrative import-export activity of the manufacturers and subjecting them to foreign competition. Thus, neither the last decade nor the previous ones were conducive to progress in the Bolivian manufacturing industry.

Presently, a large part of the campesino consumption demand is being supplied by imports. Perhaps it will be necessary to subsidize the infant Bolivian manufacturing industry with temporary protective tariffs, credit, and foreign technical assistance.

4. Gross National Product

The overall performance of the Bolivian post-revolutionary economy can be seen in the gross national product statistics of Table 32. They show a modest growth in real national income, but when population changes are considered per capita real income slightly decreased during the period 1952 to 1964. However, "it should be noted that the estimating procedure is crude. This is particularly true of agriculture where the range of error is considerable."[27] Unfortunately, it is precisely the subsistence agricultural sector which is of interest to this study of the Bolivian land reform. In addition, these national income accounts reveal

[27] Economic and Program Statistics, p. 38.

nothing about the land, labor, or income redistribution effects of the Bolivian land reform.[28]

TABLE 32

GROSS DOMESTIC PRODUCT: 1950-1964
(in millions of 1958 dollars)

	1950	1952	1954	1956	1958	1960	1961	1962	1963	1964
Agriculture	118.1	113.1	101.7	104.2	112.2	114.1	119.7	118.5	125.1	127.7
Mining	52.1	58.3	48.3	46.1	33.2	31.0	31.8	33.6	35.6	40.3
Petroleum	2.5	2.1	6.9	13.1	14.1	14.5	13.8	14.8	16.1	17.1
Mfg.Industry	48.0	49.0	54.9	51.4	45.0	48.2	48.2	53.0	56.8	62.4
Commerce and Finance	40.5	48.5	42.5	45.8	45.3	47.8	48.0	50.6	54.2	57.2
Construction	1.8	3.6	2.5	2.6	12.8	14.9	12.1	15.5	18.1	18.6
Transport	19.7	23.9	26.4	29.7	30.0	31.1	31.3	33.1	35.4	37.7
Government	41.0	55.0	28.6	26.0	27.1	28.9	31.9	36.5	37.8	39.1
Other Service	32.2	34.3	34.4	35.9	34.0	37.2	38.7	40.9	42.8	45.0
Total	355.9	387.8	346.2	354.8	353.7	367.7	375.5	396.5	421.9	445.1

Source: Secretaría Nacional de Planificación y Coordinación, Plan Nacional de Desarrollo Económico y Social 1962-1971 (La Paz, July, 1961), p. 30A, and same source single table, July, 1965, as cited in USAID-Bolivia, Economic and Program Statistics (La Paz, December, 1965), p. 4.

However, these national income statistics do indicate that the non-agricultural sector of the Bolivian economy has not been expanding rapidly enough to need or employ the surplus labor that might have been drawn from the ex-haciendas. Also, the capacity of this sector to absorb national food surpluses did not substantially increase over the last

[28] For example, from 1951 to 1965, Bolivia's student enrollment increased from 246,880 to 647,894--an increase of over 260%. A large part of this increased enrollment is made up of campesinos and their children. See, Bolivia, Ministerio de Hacienda, Dirección General de Estadística y Censos, Boletín Estadística, 1964, No. 90, p. 78.

decade. The manufacturing industry did not or could not take advantage of the newly created agricultural demand for manufactured consumption and investment goods. Finally, the mining industry is apparently incapable of earning foreign exchange in sufficient quantity to feed Bolivia's increasing urban population and provide the economy with imported capital equipment needed for development. To an extent, therefore, it has been the non-agricultural sector which has tended to impede the course of agricultural development since the Bolivian agrarian reform. Although the growth performance of Bolivian agriculture during the previous decade has not been spectacular, it has apparently exceeded that of a number of other major industries. It would be difficult today to single out the land tenure system or the agrarian sector as constituting the Bolivian economy's single most important growth retarding feature or sector. Prior to the Bolivian agrarian reform, the latifundio land tenure system and the agricultural sector were commonly cited as reasons for Bolivia's stagnation.[29]

[29] See above, pp. 18-21.

IX. SUMMARY AND CONCLUSION

The primary purpose of this paper was to analyze the socio-economic effects of the Bolivian land reform of 1953 by means of a comparative study of Peruvian haciendas and Bolivian ex-haciendas in the Lake Titicaca region. However, the comparison of Peruvian haciendas and Bolivian ex-haciendas was interesting in itself. Therefore this concluding chapter will begin with a summary of the salient results of this comparative analysis.

A. A Comparison of Peruvian Haciendas and Bolivian Ex-haciendas

The Peruvian latifundio land tenure system of Puno, Peru, served as an imperfect proxy for the now extinct latifundio land tenure system in the department of La Paz, Bolivia. The haciendas of Puno, Peru, are absentee owned, large, landed extensions operating under modified, traditional, land-tenure rules with backward methods of production. In this respect they resemble the now extinct Bolivian haciendas. However, it was observed that they are not perfect proxies. These Peruvian haciendas specialize in wool, mutton, and beef to a much gréater extent than did the now-extinct Bolivian haciendas in the Region. They also use more capital equipment and smaller quantities of labor than did the Bolivian haciendas prior to 1953. Many of these differences can be attributed to the effect upon the haciendas of the minimum wage and land reform decrees of 1964 and the location of Puno's major consumption markets. To the extent that the Bolivian land reform made it imperative that the Peruvian authorities pass such legislation, it is indirectly responsible for these changes. However, this writer has no way of knowing how influential the

Bolivian sindicatos, land reform, and other institutions were in bringing about their counterparts in the Peruvian sector of the Lake Titicaca region.

The different amounts and institutional utilization of traditional resources are the major cause of the observed differentials in production and productivity on the Peruvian haciendas and Bolivian ex-haciendas. Whereas the Bolivian land reform has increased the number of campesinos on the ex-haciendas, the Peruvian land reform and minimum wage decrees occasioned migration from the haciendas. The result was an observed population density per square mile of 67.9 on the sampled ex-haciendas in the Bolivian sector as compared to 8.3 on the four haciendas in the Peruvian sector of the Region. Consequently, a greater percentage of the land is more intensively cultivated on the Bolivian ex-haciendas. However, the Peruvian haciendas possess more agricultural machinery, especially of the type used in wool production. The recent increase in investment on these Peruvian estates can largely be attributed to an attempt on the part of the hacendados to retain greater portions of their lands under the rules of the Peruvian land reform. It was pointed out, however, that much of this agricultural machinery was underutilized; consequently, in many respects the organization and methods of production are quite similar on both the haciendas and ex-haciendas. In addition, both the Peruvian haciendas and the Bolivian ex-haciendas have nearly identical livestock densities of about three U.A.O.'s (sheep equivalents) per hectare. Because of their small numbers relative to the land and livestock, the Peruvian campesinos have in their charge more livestock, 526.5 U.A.O.'s per family, than do the Bolivian campesinos who shepherd only 67.6 on the average. The predominately

mixed breed sheep and cattle of the Peruvian haciendas are better quality stock than the criollo breeds of the Bolivian ex-haciendas. This is largely the result of the historic specialization in wool production, orientation to international markets, and livestock investment on the Peruvian haciendas, none of which were characteristic of the expropriated Bolivian ex-haciendas.

Because of the much greater quantities and slightly better quality of resources relative to each unit of labor, the Peruvian haciendas were able to achieve a much higher value productivity per unit of labor. Also due to the small percentage of land cultivated, the output per hectare cultivated slightly exceeded that on the Bolivian ex-haciendas. However, when all land is taken into account, the Bolivian campesinos on the ex-haciendas produced a value output per hectare nearly double that of the Peruvian haciendas. The average percentage return on livestock capital was the same on both the haciendas and ex-haciendas. There are indications that an expansion in the cultivation of crops and pastures, a greater investment in better-breed livestock, and an improvement in the technological methods of production would increase the production and productivity of both the haciendas and ex-haciendas. Thus, both the Peruvian haciendas and Bolivian ex-haciendas in the Region were observed to be producing at somewhat less than their optima. However, it is not at all certain which group is more efficient because of the nature of these traditional firms and the limitations of the data.

Because of the large amounts of labor on the Bolivian ex-haciendas, they are able to produce nearly the same total value output as the Peruvian haciendas on only half the amount of land. Both groups provide their

respective domestic economies with nearly the same agricultural surpluses. However, the Peruvian haciendas do generate large amounts of foreign exchange from their wool sales in the international markets, while the Bolivian campesinos sell virtually none of their criollo wool.

The disposition of the Peruvian hacendado profits is unknown. It is assumed, however, that they are largely expended in the traditional manner on consumption and real estate investments. It is known that the Peruvian campesinos, in the aggregate, receive approximately one-fifth of the total gross income of the haciendas in the form of money wages. In spite of this, accumulated evidence indicates that the Bolivian campesino family earns half the money income and a slightly higher total income than the average Peruvian campesino family. Thus, although the Peruvian campesino is approximately four times as productive as his Bolivian counterpart, he receives a lower total income on the Peruvian haciendas. This does not take into account the off-farm and non-farm earnings of the Bolivian campesinos who, unlike their Peruvian counterparts, now have the free time to earn this type of outside income. Excluding small price differentials, it was shown in this paper that the Bolivian campesinos have a higher per capita standard of living. Since the Peruvian minimum wage decree has only been in effect for two years, prior to 1964 the Peruvian campesinos apparently had a much lower money income, total income, and standard of living than their Bolivian neighbors during the previous decade. In addition, it appears that the Bolivian campesinos are typically more educated, literate, integrated into the market economy and society than the Peruvians.

The Peruvian haciendas would presumably have been better proxies for the expropriated Bolivian haciendas in the Region prior to the 1964

minimum wage and land reform decrees. The haciendas in the Department of Puno before 1964 generally used large numbers of campesinos who were not paid a money wage or paid a very small one. In addition, they did not possess the amount of capital equipment they do today. These Peruvian haciendas would have been even better proxies prior to the 1953 Bolivian land reform inasmuch as they have been able to improve their livestock since that time. In an attempt to approximate the pre-reform Bolivian sector of the Lake Titicaca region, one might quite realistically ignore virtually all of the cash income of the Peruvian campesinos, most of the newly acquired farm equipment, and even much of the international wool sales of these Peruvian haciendas. In sum, this comparative analysis was useful in many respects, one of which was to differentiate the Peruvian haciendas of 1965 from the Bolivian haciendas of 1950. As it turned out, this proved invaluable in analyzing the effects of the Bolivian land reform.

B. An Evaluation of the Bolivian Land Reform

Implicit throughout this critical investigation was an evaluation of the Bolivian land reform. Therefore, an appropriate conclusion to this inquiry would be to summarize the findings of this comparative study and in so doing attempt an explicit evaluation of the Bolivian land reform. Such is the task of this final section.

At the outset, a great deal of semantic confusion will be avoided by defining once again a number of important terms. The true Bolivian land reform which will be evaluated is the actual land redistribution, both legal and extra-legal, of the large landed estates referred to as latifundios or haciendas. However, in the process of this appraisal, the

difference between the legal and the true Bolivian land reform will be clarified. All other programs to increase agricultural production and productivity, such as road construction, technical and financial aid to farmers, and agrarian cooperative and colonization projects, will not be considered an integral part of the Bolivian land reform, but appendages to it. Because many individuals, especially North Americans, consider these supplemental agrarian programs part of the Bolivian land reform, they also will be briefly commented upon, but separately from the effects of the true Bolivian land reform.

The three inclusive goals of the Bolivian land reform were to administer economic justice (reduce the gross inequalities of income, opportunity, and freedom), promote economic efficiency in agriculture, and ultimately to induce agricultural and thus economic development. These general goals are written in the preamble to the Decreto de la Reforma Agraria and in the published statements of the M. N. R. party leaders and framers of the Bolivian land reform law. This does not imply that there existed unanimity among all parties concerned with respect to either definitions, relative importance, or even feasibility of the generalized land reform goals to be achieved by land redistribution. This is understandable inasmuch as there is not complete accord among economists, sociologists, anthropologists, and other students of land reform on these same issues. Nevertheless, at one time or another, various individuals from among these groups of policy makers and scholars have claimed that the goals of the Bolivian land redistribution are to administer "economic justice," promote agricultural efficiency, and induce agricultural progress. This alone would appear to be sufficient justification to warrant an evaluation of the Bolivian land reform with respect to these objectives.

Before proceeding with this appraisal, one additional point needs clarification. What constitutes a successful attainment of each of these Bolivian land reform goals? It will soon become obvious that there is no definitive, ultimate, or value-neutral answer to this question. Therefore, a number of fundamental principles adhered to in the present investigation must be born in mind throughout by the reader if this evaluation of the Bolivian land reform is to be intelligible. First of all, the definitions of economic justice, efficiency, and progress used in this appraisal are those set forth in the second chapter of this paper, which for convenience, will be reiterated in this section. Secondly, the authorative ethic accepted is that of the Bolivian government and its laws, which are assumed to exhibit the political consensus. In addition, the degree of success of each of the land reform goals will not be presumed to exceed limits realistically obtainable within the short time period which has elapsed since the inauguration of the Bolivian land reform.

1. Economic Justice

A reduction of inequities in the social organization of economic activity is the definition of economic justice used in this paper. The manner in which this objective of the Bolivian land reform was to be achieved is seen in the preamble and elsewhere in the decree. An immediate program was to be undertaken to free agricultural laborers from gratuitous personal services and obligations, redistribute land to the peasants who work it, and to restore land to the indigenous communities. This was to be accomplished by destroying the latifundios while respecting the small farms, medium farms, and "agricultural enterprises."

In the words of Victor Paz Estenssoro, the act of redistributing the lands of the latifundios among the campesinos in and of itself constitutes "justification" for the Bolivian land reform. It is obvious that administering economic justice was the immediate objective of the land reform as well as the one generally considered most likely to succeed. Indeed, the emphasis placed upon obtaining this goal of economic justice by the Bolivian policy makers is clearly seen in the accomplishments of the legal land redistribution program. As of January 1, 1966, 263,139 land titles for a total of 6,278,803 hectares had been awarded to campesinos by the Bolivian Agrarian Reform Office. However, the amount of land legally redistributed, which is equal to about 20% of the total land area of Bolivia in agricultural units at the time of the 1950 agricultural census, is only a part of the land actually redistributed since the 1952 revolution. It was pointed out earlier in this paper that in the early days of the Bolivian revolution the impatient campesinos seized many of the large haciendas, divided the land among themselves, and presented the government with de facto redistribution. This happened in the Cochabamba Valley before the formal declaration of the law and in many other regions of the country shortly thereafter. One can only venture a guess as to the amount of land actually redistributed but without legal titles either because of the lagging legal process or because such redistributed land never will be sanctioned by the law. However, when it is recalled that most of the land redistribution took place in the most populated agricultural regions of the country such as the Altiplano and the Valleys, it becomes evident that nearly all of the nation's campesinos were affected.

From the strictly legal point of view, the land redistribution program is something less than a success. The land was not redistributed

in strict accordance with the provisions of the statue. Many campesinos received more land than they were legally entitled to, while others received substantially less. Some latifundios still exist, while a few "agricultural enterprises" have been redistributed. Titles to all the legally redistributed land have not yet been issued and the legality of a substantial amount of land actually redistributed is ambiguous. Above all, the expropriated landlords were not compensated for their lands as stipulated by the Decree. In short, the legal Bolivian land reform is a failure from the lawyer's point of view.

However, from the point of view of many of the Bolivians responsible for the reform, as well as a number of land reform scholars, the true Bolivian land reform was successful in achieving its immediate objective of administering economic justice to the parties concerned. It destroyed most of the latifundios and redistributed their lands to the peasants who work them, it freed the agricultural laborers from gratuitous personal services, and it restored some lands to the indigenous communities. In so doing, the true Bolivian land reform redistributed income. This was clearly shown to be the case in the Lake Titicaca study region. A similar income redistribution took place in the remainder of the Altiplano, Yungus, and Valleys agricultural regions. For example, data was presented in this paper which indicates that the average campesino in the Lake Titicaca region possesses about the same amount of land and livestock today as he did before 1953. However, his freedom from obligatory labor services to the hacendado has permitted him to intensify his agricultural production, construct more commodious living quarters, increase his marketing activity, and to obtain off-farm as well as non-farm employment. Where previously he had only one type of income, subsistence

income, he now has two additional incomes--money and leisure. Consequently, he consumes greater quantities of manufactured and other products more often than he did prior to the Bolivian land reform. In addition, since 1953, many landless campesinos, indigenous communities, and sons of colonos have been able to obtain land. However, for the majority of campesinos the most significant social and economic benefit received from the Bolivian land reform was freedom from the 150 to 600 days of labor per year that each family was obliged to render to the hacendados under the old latifundio land tenure system. Some campesinos acquired more land, most increased their income, and virtually all gained their freedom. For this reason, the term economic justice and not income or wealth redistribution was used to designate this goal of the Bolivian land reform.

But, it might be asked, how can this be termed just? The Bolivian ex-hacendados consider this land redistribution an unjust confiscation. On the other hand, the campesinos claim that the land was originally confiscated from them and the latifundio land tenure system reduced them over the years to a position of serfs or sub-humans. Both past inequities were only partially corrected by the land reform. However, present injustice is not generally conceded to be an equitable solution to past injustices. The only way out of this dilemma for a social scientist is to accept some authoritative ethic other than his own, which in this case is the government and laws of Bolivia. There seems to be little doubt that one goal of the Bolivian land reform was to destroy the latifundios and redistribute land, labor services, and income to the campesinos. Since this goal has been realized, the economic welfare of the nation can be said to have increased and economic

justice achieved. Any other conclusion must accept some value judgment other than that of the Bolivian government as reflected in her Decreto de la Reforma Agraria and present acceptance of the true Bolivian land reform. The President of the Bolivian government, René Barrientos Ortuño--also former President of the 1964-1966 Junta Militar de Govierno--has repeatedly pledged his support of the Bolivian agrarian reform. Among the major political supporters of President Barrientos and his government are the campesino sindicatos.

2. Agricultural Efficiency and Economic Development

The framers of the law and the party leaders also expected this institutional change to set in motion forces which would increase the efficiency of agricultural production and ultimately induce agricultural and general economic development. For example, the preamble maintains that two other aims of the law are to stimulate greater agricultural productivity and to promote internal migration to the under-populated Lowlands of the nation. However, there was undoubtedly a great deal of confusion and doubt in the minds of those responsible for the land reform over the probable effects of land redistribution on agricultural efficiency and progress. In large measure, this was due to the widely-held belief of most economists that large farms are more conducive to efficiency and growth than are small farms. However, the Bolivian decision-makers made only vague reference to the effect land redistribution would have upon agricultural efficiency and economic development. They apparently felt that these two goals of the Bolivian land reform incapable of quick achievement.

In an apparent attempt to resolve this conflict of breaking up the large estates on the one hand and inducing agricultural efficiency

and progress on the other, the framers of the law exempted many medium-size farms and "agricultural enterprises," especially in the Lowlands, from the land redistribution program. The government also planned to supplement legal land redistribution with a number of other programs such as road construction, technical and financial aid to farmers, and the establishment of agrarian cooperatives and colonies. These programs will not be considered an integral part of the Bolivian land reform, but appendages to it. Therefore, in the following discussion, the effects of the true Bolivian land reform, which is defined as the actual land redistribution, upon the efficiency and progress of Bolivia's agriculture and economy will be evaluated separately from the effects of these supplemental agrarian programs.

a. Agricultural and Economic Efficiency. In this paper, a great deal of discussion was devoted to the issue of land redistribution and economic efficiency. Although there is widespread usage of the term economic efficiency, the concept is elusive and there is no general consensus upon criteria of efficiency outside the static full-employment equilibrium models of the economist. Nevertheless, the controversy surrounding this issue made it imperative to attempt an investigation of the actual land redistribution in Bolivia and its effect upon economic efficiency.

At the firm level, evidence was presented which indicated that no significant change had taken place in the economic efficiency of production as a result of land redistribution. It was pointed out that in the Lake Titicaca region approximately two-thirds of the Bolivian hacienda lands was exclusively utilized by the campesinos and three-fourths of the livestock on these estates were owned by the campesinos before

the land reform. To a large extent, the Bolivian haciendas were agglomerations of small campesino farms before 1953. They did not possess great amounts of productive physical capital, nor did they employ production methods other than those traditionally used by the campesinos. Consequently, when the lands exclusively used by the hacendados and portions of their criollo livestock were parcelled among the campesinos, no verifiable economies of production were lost. Because they were not operative at the time of the reform or because they did not even potentially exist, no size economies such as managerial, financial, or mechanical were lost as a result of the land redistribution. This does not imply that the small campesino farms are either efficient or of optimum size. However, it does indicate that the large landed estates in the Altiplano and elsewhere were and are not necessarily more efficient than the small campesino farms by virtue of size alone. What took place in the time span between the land reform and the field study was an increase in the number of campesinos on these ex-haciendas due to both an influx of outsiders and the natural increase of the population. This has apparently necessitated the cultivation of more land, much of which is marginal and therefore relatively unproductive.[1] Therefore, since the reform, it is probable that physical output per hectare cultivated has decreased. However, when the entire extension of land is taken into the calculation, physical and value productivity per hectare of land has undoubtedly increased, since the greater numbers of campesinos are more

[1] This is partly due to the inability or unwillingness of the campesinos to cultivate the lands of the ex-hacendados which are more fertile, but whose legality is still in doubt.

intensively using land which prior to the land reform was underutilized or lying idle.[2]

On the other hand, this increase in the number of campesinos and their freedom from obligatory labor services has possibly resulted in a decrease in agricultural output per man-year equivalent of labor on these ex-haciendas since the reform.[3] Thus, while total output has increased on these ex-haciendas, it would appear, on the basis of the evidence presented in this paper, that the increase in population has exceeded that of the increase in agricultural output. This is probably due to the increased use of marginal land, inability to use the idle fertile land of the ex-hacendados, and the small decrease in mechanized equipment and better-breed livestock. Also, in part, this reflects the increase in non-agricultural activities and off-farm employment of these ex-hacienda campesinos.

Finally, there has been very little, if any, decrease in output per unit of livestock capital which was virtually the only type of capital in abundance before the agrarian reform. The decreased criollo herds of the hacendados have been almost completely compensated for by the increased herds of the campesinos. These campesinos have been able to maintain the apparent traditional optimum number of livestock which, both before and after the land reform, was three U.A.O.'s (sheep equivalents) per hectare. This is not surprising when it is recalled that approximately three-fourths

[2]A logarithmic production function of the Bolivian campesino farms revealed that cultivated land provided the greatest marginal value product of any traditional resources available to the campesinos. See Appendix J.

[3]However, it is not at all certain that output per man hour of input has decreased during this period. The data available for comparison over time was not sufficiently refined to compute this more meaningful productivity statistic.

of the livestock on these haciendas prior to 1953 was the property of the campesinos.

It was also pointed out in the previous chapter of this paper that the effects of the true Bolivian land reform upon agricultural efficiency in the remainder of the Altiplano, the Yungas, and the Valleys agricultural regions were not unlike those found in the Lake Titicaca study region.

An increase in the number of people engaged in marginal agriculture and a decrease in agricultural productivity per unit of labor are generally considered among economists to be prima-facie evidence of an economically inefficient allocation of a nation's resources. However, Bolivia is not a full employment economy and the decrease in labor productivity in the agrarian sector must be considered in conjunction with the increased employment in agriculture and the higher land productivity which resulted from the Bolivian land reform. In addition, the land reform created a free and mobile campesino labor force which is, of course, a necessary condition for economic efficiency from the social point of view. However, efficiency from the macro-economic point of view can perhaps best be considered in conjunction with economic progress.

b. Agricultural and Economic Development. It is probably too soon to evaluate the effects of the Bolivian land reform upon either agricultural or economic development. Nevertheless, evidence presented in this paper seems to indicate that the Bolivian agriculture is not today and may not be in the future the economic growth impediment it has been in the past. For example, on the supply side it was seen that the Bolivian campesino farms with little or no outside assistance were able to exceed pre-reform levels of agricultural output for most products. By combining greater quantities of traditional inputs of land and labor, they were able to obtain for themselves a higher standard of subsistence living and provide

the cities and towns with agricultural surpluses in excess of pre-reform levels. The campesino has shown himself capable of adapting to a money market economy. He is today more integrated into both the economy and society of Bolivia. Largely because of the land reform, he is more socially, geographically, and occupationally mobile. He is engaging in marketing, educational, and political activities, which before 1953 were denied him. Because campesinos comprise a majority of the nation's population, the effect of these changes upon Bolivia's economic future will undoubtedly be enormous. On the demand side, the increased money incomes of the campesinos have, for the first time in Bolivian history, given rise to a mass consumption demand for manufactured products. Admittedly, this demand is only in its embryonic state, but it will grow as the campesino incomes grow.

Aside from these beneficial and even more potentially beneficial economic developmental consequences of the Bolivian land reform, there still remain two very potent growth arresters in the Bolivian agrarian sector. They are the lack of capital and modern technology. While the Bolivian campesinos were shown to have attained pre-reform levels of production and productivity, they have not been able to exceed these traditional optima. Apparently, as Theodore W. Schultz of the University of Chicago has said, these traditional optima can only be exceeded by the infusion into the agrarian sector of non-traditional inputs such as better seed, improved breeds of livestock, and agricultural equipment. In short, credit, agricultural extension services, and similar outside assistance is needed. This new technology is capable of application in small quantities and, in this respect, the small size of the campesino farm is no deterrent to increased agricultural output and productivity.

What the Bolivian campesinos need is a new patrón like the one farmers have in the United States. "Perhaps the Department of Agriculture, and not the family farm, is the real backbone of the American farm system."[4] It would be interesting to see the effects of an agricultural assistance program such as the one in the Santa Cruz region applied to the Cochabamba Valley or the Altiplano. For example, H. G. Dion saw no reason why the Altiplano should not supply all of Bolivia's beef requirements and produce enough wheat or substitute grains to eliminate the need for these imports. However, Dion does caution against the imposition of culturally-bound agricultural equipment, extension service programs, or credit institutions like those of the United States upon the campesinos in the Altiplano.[5]

Funds for these needed credit and extension service programs could be partially met by a small property tax on agricultural land. Such a tax would simultaneously prevent any future accumulation of large tracts of idle land for speculative or prestige purposes. A supplemental program utilizing the abundant leisure of the campesinos to construct and maintain such social overhead capital as schools, roads, and irrigation works might also be given consideration. While it is true that most of the rural cooperatives established immediately after the land reform were dismal failures, the sindicatos have been able to exploit the social labor tradition of the campesinos to a limited extent. Perhaps in the future when the land reform has been consolidated the sindicatos will shift their emphasis from political and social to economic activities.

[4] Doreen Warriner, p. 40.

[5] H. G. Dion, Agriculture in the Altiplano of Bolivia, Food and Agriculture Organization of the United Nations Development Paper No. 4 (Washington: May, 1950), passim.

However, like the savings of the hacendados, these are only potential sources of physical productive capital.

In the long-run it is almost universally conceded that "the future of Bolivia's agriculture rests mainly in the untapped agricultural resources in the lowlands and remote valley areas."[6] It was pointed out in this paper how development of the Santa Cruz region, construction of hard-surface roads to the Lowlands, and similar programs have resulted in greater agricultural output and productivity, as well as decreased food imports since 1953. However, these were not the direct results of the Bolivian land reform, but a consequence of the Economic Diversification Program made possible by United States technical assistance and economic aid. Nevertheless, a mass migration from the overpopulated Altiplano and Valleys to the Lowlands would probably result in a more rational distribution of the nation's population and agricultural resources. That is to say, it is reasonable to expect a migration of great magnitude to the Lowlands to substantially increase Bolivia's agricultural output, productivity, and employment. One of the land reform objectives listed in the preamble to the law is to promote domestic migration of the rural population to these eastern areas. Actually, under existing conditions the "push" factor of overpopulation and the "pull" factor of economic attraction have not been sufficient to induce the desired mass migration.[7]

[6] John V. Lynch and Paul J. Ferree, The Agricultural Economy of Bolivia, Economic Research Service of the United States Department of Agriculture (Washington: U.S. Government Printing Office, May, 1961), p. 18.

[7] A social-economic comparison of eight communities in the Altiplano and the Lowlands indicates that the "pull" effect is more important than the "push", and that conditions in the Lowlands have not yet become so relatively attractive as to cause any rush of campesinos to these regions. Although the campesinos on the highlands have less land and therefore a lower labor productivity than those sampled in the Lowland communities, their land is more valuable, their livestock herds larger, and their off-farm earnings greater. See Kelso L. Wessel, passim.

Of course, agricultural efficiency and development cannot realistically be considered in isolation. Sector analysis is only an intellectual abstraction. Although the demand for agricultural products in Bolivia is a great deal more income and price elastic than it is in developed nations, the stagnant and even regressive growth performance of a number of Bolivia's other major industries since 1953 indicates that insufficient demand may soon become a serious deterrent to the agricultural and general economic progress of the country. There are already some indications of this situation arising in the markets for corn, sugar, and rice. For unlike the United States and some other developed nations, Bolivia has no support program for agricultural products which guarantees an infinite demand at some fixed "parity" price. Exportation of food and other agricultural products may be a possible long-run solution once production and transportation costs have been lowered to enable these products to compete in the world markets. However, it is difficult to imagine how these economies will be realized unless the non-agricultural sector is able to overcome its present inability to employ the surplus labor on the ex-haciendas or provide the agricultural sector with the manufactured consumption and investment goods they desire and need. In short, the interdependence of the various industries of the country must be taken into consideration when evaluating the Bolivian land reform.

3. Summary of Evaluation

The Bolivian land reform was a means to achieve various goals and not an end in itself. On the one hand, and contrary to the expectations of some land reform proponents, this analysis furnished evidence

which indicates that the Bolivian land reform was not a panacea for the nation's agricultural and economic problems. On the other hand, and contrary to the dire predictions of land reform opponents, no evidence was found to indicate that Bolivia's agricultural and general economic efficiency and progress have grievously suffered as a consequence of land reform. On balance, therefore, the true Bolivian land reform, after the short time span of thirteen years, might be considered a net gain since it was shown to have been successful in achieving economic justice.

It was emphasized throughout this investigation that the greatest accomplishment of the Bolivian land reform was its transformation of the nation's rural masses from Indians or colonos to campesinos and all that this change implies. "Land reform is not only a reform of the way land is held, but just as much reform of the man who tills the land."[8] The Bolivian land reform was not only a redistribution of land, wealth, or even income. It was simultaneously a redistribution of opportunity, power, and freedom. Although the majority of campesinos did not fight to obtain these rights and benefits, no one should doubt their willingness or ability to defend them. Where previously the campesino paid a labor tax for the land he used, he now pays no tax and is the owner of private productive property. If the latter is truly the institution which "turns sand into gold," then these new property owners have as their task that which the absentee landowners failed to accomplish. If the existence of a free and socially, occupationally and geographically mobile labor force is conducive to economic efficiency and development, then the creation of

[8]Erich H. Jacoby et al., Inter-Relationship Between Agrarian Reform and Agricultural Development, Food and Agricultural Organization of the United Nations (Rome, Italy, September, 1953), p. 63.

this institution by the Bolivian land reform augurs well for the attainment of these national goals. The Bolivian society is no longer divided into Indians and Bolivians as before the M. N. R. revolution and land reform, and the uncertain future of Bolivia will undoubtedly be greatly influenced by the campesino majority who are now free to either succeed or fail.

It is the hope of this writer that scholars of land reform and decision-makers responsible for land reform will find this in-depth study of the socio-economic effects of the Bolivian land reform useful. Although land reform is a dynamic cross-disciplinary subject, this study appears to indicate that intensive research of land reform using the comparative method of analysis is possible and much valuable data and other information can be obtained. In general, the findings of this study caution against equating size and efficiency and viewing land reform as an economic panacea. The results of this study also indicate that under similar circumstances, a revolutionary land redistribution patterned after the Bolivian model could be expected to have its greatest impact upon the lives of the peasants in the short-run, and not upon agricultural and general economic efficiency or development.

Appendix A: Bolivian and Peruvian Campesino Questionnaire (translated from Spanish)[1]

Family Composition:

Persons	Sex	Age	Birth Place	Years of Formal Schooling: Finished	Years of Formal Schooling: Attending	Spanish: Speak	Spanish: Read and Write
Head of Household							
Wife							
Father							
Mother							
Children							
Other							

1. Have you lived for more than 10 years on this hacienda (ex-hacienda)?

   1. yes
   2. no

(If the answer is NO)

What have been your last three residences and occupations?

Place	From	To	Occupation

[1] This questionnaire was written in Spanish while the interviewing was conducted in Spanish, Aymara, or Quechua. The same questions were asked of both the Bolivian and Peruvian campesinos except where indicated. The time reference was "ten years ago" for the Peruvians and "before the agrarian reform" for the Bolivians.

2. Do you plan to change your place of residence within the next five years?

1. yes
2. no

(If the answer is YES)

A. Where do you plan to move?_____

B. When do you plan to move?_____

C. What type of work do you plan to obtain in this new location?___

_____

3. Are you a:

1. shepherd
2. foreman
3. colono
4. farm laborer
5. small farm owner
6. other_____

4. Your father was:

1. shepherd
2. foreman
3. colono
4. farm laborer
5. small farm owner
6. other_____

5. Ten years ago (before the agrarian reform), were you a:

1. shepherd
2. foreman
3. colono
4. farm laborer
5. small farm owner
6. other_____

6. What occupation do you desire for your children?

1. shepherd
2. foreman
3. colono
4. farm laborer
5. small farmer
6. miner
7. laborer
8. salaried employee
9. small businessman
10. professional

7. What type of schooling have you had within the last ten years?_____

_____

8. What education do you desire your children have?

1. none
2. primary
3. secondary
4. trade school
5. agricultural school
6. other_____

9. Are (were) you a member of a campesino union?

1. yes
2. no

(If the answer is YES)

What office do (did) you hold while a member?_____

10. What other organizations do (did) you belong?_____

_____

11. Have you served in the army?

1. yes_____ (where)
2. no

12. Is your house:

1. of the hacienda
2. privately owned
3. rented
4. other_____

13. Does your house have:

1. table and chairs
2. tableware
3. windows
4. other_____

14. On what does your family sleep?

1. on the floor
2. on mud beds
3. on wooden beds
4. on iron beds
5. other_____

15. Do (did) you own a house and/or land outside the hacienda?

1. yes
2. no

16. Which of the following "bought-goods" do you use and how frequently?

Type	Daily	Sundays and Other Holidays	Once in a While
Jackets or Overcoats			
Trousers			
Shirts			
Shoes (leather)			
Hats			
Sandals (rubber)			
Other			

17. Which items below do you have in good working condition and when did you buy them?

Type	Number	Date of Purchase
Sewing Machine		
Bicycle		
Kerosene Burner		
Radio		
Weaving Machine		
Watch		
Other		

18. Which of the products listed below does your family consume and how frequently?

Type	Daily	Sundays and Other Holidays	Once in a While
Coca			
Rice			
Coffee			
Sugar			
Beef			
Mutton			
Llama Meat			
Alcohol			
Tobacco			

NEXT QUESTION ASKED OF BOLIVIAN CAMPESINOS ONLY

19. Since the agrarian reform, your diet:

1. has improved
2. is the same as before
3. is worse than before

20. How many of your children have died?

Name	Cause of Death	Age at Time of Death

21. Which are the most frequent major illnesses you and your family have experienced within the last ten years?_____

_____

22. Whom do you consult whenever a member of your family is ill?

1. no one
2. a friend
3. a native witch doctor
4. administrator of the hacienda
5. medical doctor
6. other_____

23. Aside from shepherding the haciendas livestock, how many days per week do (did) you work for the hacendado?_____

24. How much does (did) the hacendado pay per day of work (in money and/or products)?_____

25. What other obligatory services do (did) you render to the hacendado for use of his land?_____

26. Do (did) you receive a vacation with pay? If so, how much?_____

_____

NEXT QUESTION ASKED OF THE PERUVIAN CAMPESINOS ONLY

27. What were the conditions of work and pay ten years ago?_____

_____

QUESTIONS 28 THROUGH 33 BELOW ASKED OF THE BOLIVIAN CAMPESINOS ONLY

28. How many hectares of land did you cultivate before the agrarian reform and what type of land--level or hilly-broken?_____

_____

29. Did your father receive land with the agrarian reform?_____

30. Did any of your children receive land with the agrarian reform?____

_____

31. Did you receive land with the agrarian reform?_____

(If the answer is YES)

A. Number of hectares received:

Level_____

Hill-broken_____

B. What is the situation of your title?

1. none
2. in hand
3. in legal process

32. Are your lands:

1. joined
2. fragmented

(If the answer is FRAGMENTED)

A. How many lots do you have?_____

B. What is the distance from one lot to the other?_____

33. Did you rent any of your land last year (1964-1965)?

1. yes
2. no

(If the answer is YES)

A. From (or to) whom?_____

B. How many hectares?_____

C. Rent per hectare?_____

34. What is the amount and type of land you have use of for the subsistence of your family?

Use	Level	Hill	Broken
Cultivated			
In Rest			
Pasture			

35. The land you cultivate, is it:

1. joined
2. fragmented

36. Do you presently have more land for your own use today than you did ten years ago (before the agrarian reform)?

1. yes
2. no

37. Production and Disposition of Staple Crops During the Agricultural Year 1964-1965:

	Potatoes	Cañahua	Quinua	Habas	Barley	Oca	Other
Number of hectares cultivated							
Amount of seed used (lbs.)							
Amount Harvested (lbs.)							
Amount consumed in household (lbs.)							
Amount sold in the market (lbs.)							
Price per pound sold							
Amount retained for seed (lbs.)							

38. Number, Production, and Disposition of Animals:

	TOTAL NUMBER							
	Cattle			Sheep				
	Bulls	Cows	Calves	Rams	Ewes	Lambs	Llama	Alpaca
Presently Own								
Consumed Last Year								
Sold Last Year								
Price Per Animal Sold								
Born Last Year								
Died Last Year								
(BELOW ASKED OF BOLIVIAN CAMPESINOS ONLY)								
Owned Last Year								
Purchased Last Year								
Price Per Animal Purchased								

	TOTAL NUMBER					
	Horses	Burros and Mules	Fowl	Pigs	Rabbits and Guinea Pigs	Other
Presently Own						
Consumed Last Year						
Sold Last Year						
Price Per Animal Sold						
Born Last Year						
Died Last Year						
(BELOW ASKED OF BOLIVIAN CAMPESINOS ONLY)						
Owned Last Year						
Purchased Last Year						
Price Per Animal Purchased						

NEXT QUESTION ASKED OF BOLIVIAN CAMPESINOS ONLY

39. Before the agrarian reform, what was the total number of animals you owned?

Cattle_____ Horses_____

Sheep_____ Burros and Mules_____

Llama and Alpaca_____ Pigs_____

Fowl_____

40. The total number of animals you presently own relative to ten years ago (before the agrarian reform) is:

1. equal
2. little more
3. little less
4. twice as many
5. half as many
6. other_____

41. Production and Disposition of Animal Products:

	Wool						
	Sheep	Llama	Alpaca	Milk	Cheese	Hides	Other
Produced Last Year							
Consumed Last Year							
Sold Last Year							
Price Per Sale							

42. To whom do you sell your products?_____

43. Where do you sell your products?_____

44. Do you barter your products?

1. yes
2. no

45. How do you transport your products to the market?_____

46. Types, Number, and Other Information on the Agricultural Equipment Used:

Type	Number Owned	Year Bought or Made
Native Plows		
Spades (hoes)		
Native Spades		
Axes		
Picks		
Shovels		
Wheelbarrows		
Native Mattock		
Rakes		
Steel Pole (for breaking ground)		

47. Did you borrow any equipment last year?

Type	Number	Borrowed for How Many Days	Rent Per Day

48. Is the amount of equipment you have today as compared with ten years ago (before the agrarian reform):

1. equal
2. more
3. less
4. other (explain)_____

49. What type and how much fertilizer do you use?

Type	Number of Pounds	Price Per Pound
Animal		
Mineral		
Synthetic		

50. The amount of fertilizer you use now as compared with ten years ago (before the agrarian reform) is:

1. equal
2. more
3. less
4. other (explain)_____

51. With whom do you colaborate in the cultivation of:

Your Land	Others Land
1. Members of your family that do not live in your house	1. Members of your family that do not live in your house
2. Neighbors or friends	2. Neighbors or friends
3. Hired hands	3. Hired hands
4. Others (explain)_____	4. Others (explain)_____

52. Type of payment:

Paid to Others	Received From Others
1. Money	1. Money
2. Percentage of the crop	2. Percentage of the crop
3. Reciprocity	3. Reciprocity
4. Other (explain)_____	4. Other (explain)_____

53. During what times of the year did you work with others?

On Your Land	On Others Land
1. Year round	1. Year round
2. Plowing	2. Plowing
3. Sowing	3. Sowing
4. Weeding, hoeing, etc.	4. Weeding, hoeing, etc.
5. Harvesting	5. Harvesting
6. Other (explain)_____	6. Other (explain)_____

54. Have you constructed any of the following within the last ten years (since the agrarian reform)?

House_____ Dam (water)_____

Fence_____ Other (explain)_____

Well (water)_____ _____

55. Domestic Production By Type and Amount for the Previous Year:

Products	Amount Produced	Amount Sold	Price Per Sale
Wool Yarn (thread) (lbs.)			
Wool Flannel Cloth (meters)			
Wool Rope (meters)			
Grass Rope (meters)			
Hats			
Ponchos			
Blankets			
Sweaters			
Others			

56. The amount of domestic production last year as compared with ten years ago (before the agrarian reform) is:

1. equal
2. a little more
3. a little less
4. twice as much
5. half as much
6. other_____

57. What is the total amount of your debts?_____

To whom are you indebted?

1. government
2. bank
3. businessman
4. money lender
5. hacienda
6. friend or neighbor
7. other_____

58. What was the total amount of your debts ten years ago (before the agrarian reform)?_____

59. Which of the following do you need most in order to have a happier life for you and your family?

1. nothing
2. credit
3. more land
4. better land
5. farm equipment
6. fertilizer
7. seed
8. better wage
9. other_____

60. Who, in your opinion, would be able to provide you with the above?

1. nobody
2. government
3. union
4. hacienda
5. friends and neighbors
6. family
7. other_____

61. What person do you respect most within the community?

Name_____ Occupation_____

62. What other person do you respect within the community?

Name_____ Occupation_____

63. In what country do you live?

1. Bolivia
2. Peru
3. Chile
4. other_____

64. What is the capital of your country?

1. knows
2. does not know

65. Who is the president of the country?

1. knows
2. does not know

66. Why is July 28 (August 6) celebrated?

1. knows
2. does not know

67. Do you know these agricultural extension institutions, and in what way have they helped you?

Institution	Number of Years Known	Type of Aid Received
Minister of Agriculture		
Agricultural Bank		
Agrarian Reform Office (PERU ONLY)		
Cooperacion Popular (PERU ONLY)		
S. I. P. A. (BOLIVIA ONLY)		
Desarrollo para la Communidad (BOLIVIA ONLY)		
COMBOFLA		
(other)		

NEXT QUESTION ASKED OF PERUVIAN CAMPESINOS ONLY

68. What is the Peruvian Agrarian Reform?

1. knows
2. does not know

69. Do you know anything about the Bolivian (Peruvian) agrarian reform?

1. yes
2. no

(If the answer is YES)

A. For how many years have you known of this agrarian reform?____

B. From what source did you first learn of this agrarian reform?

1. friends or neighbors
2. union
3. government agent
4. hacienda administrator
5. radio
6. other_____

70. Please give the information asked on all members of your family who have left (immigrated from) the community:

Name	New Residence	Date of Departure	Reason Immigrated

FILLED IN BY THE INTERVIEWER:

1. Date_____
2. Location_____
3. Language Used_____
4. Comments on appearance, response, etc._____

Appendix B: Peruvian Hacienda Administrator Questionnaire (translated from Spanish)[1]

1. Who are the owners of the hacienda and what are their addresses?

Name	Address

2. Is the hacienda:

   1. rented
   2. leased

3. Do the owners of this hacienda own other haciendas?

   1. yes
   2. no

   (If the answer is YES)

Name of Hacienda	Location

4. What time of the year do the owners (renters) typically live on the hacienda? _____

5. How many years have you been administrator of this hacienda? _____

6. What is the total number of years you have been employed as an administrator of this and other haciendas? _____

[1] This questionnaire in modified form was also used to obtain information from a number of Bolivian ex-hacendados in La Paz by mail.

7. Have you ever attended an agricultural school?

1. yes
2. no

(If the answer is YES)

A. What agricultural school?_____

B. Where is the school located?_____

C. How many years did you attend?_____

8. What have been your last two residences and occupations?

Residence	From	To	Occupation	Alone or with Your Family

9. Do you plan to change your residence and occupation within the next five years?

1. yes
2. no

(If the answer is YES)

A. Where do you plan to move?_____

B. When do you plan to move?_____

C. What work do you expect to obtain?_____

10. Do you have a house or property outside of the hacienda?

1. yes_____ (explain)
2. no

11. Does the hacienda have a store for the campesino laborers?

1. yes
2. no

(If the answer is YES)

A. What products does the hacienda sell?

1. seed
2. insecticide
3. food
4. clothing
5. coca and alcohol
6. other_____

B. Relative to the prices of the stores in town, are the prices of the hacienda store:

1. equal
2. lower
3. higher

12. Does the hacienda have a church?

1. yes
2. no

13. Does the hacienda have a school?

1. yes
2. no

(If the answer is YES)

A. Who constructed it?_____

B. Who pays for its teachers, books, etc.?_____

C. Who is the teacher?_____

1. How much education does he have?_____
2. How long has he taught at this school?_____
3. What is the total number of years of teaching experience that he has?_____

D. How many grades are there in this school?_____

E. How many school days are there in one year?_____

F. How long has this school been in existence?_____

14. Does the hacienda have medical supplies for the use of the campesinos?

1. yes
2. no

(If the answer is YES)

A. Who pays for these services and supplies?_____

B. How many years has this service been available?_____

15. Do the campesino laborers have a union?

1. yes
2. no

(If the answer is YES)

A. How long has this union been in existence?_____

B. Does the hacienda have a contract (written or verbal) with the union?

1. yes
2. no

(If the answer is YES)

What are the working and wage agreements of this contract?

	LAST YEAR			
employees	Number of Work Days a Year	Wage or Salary Paid Daily or Monthly	Vacation Conditions	Other Types of Payment
Campesinos				
Foreman				
Laborers				
Other Employees				
	TEN YEARS AGO			
Campesinos				
Foreman				
Laborers				
Other Employees				

16. What takes place whenever livestock which is in the care of a campesino dies?_____

17. What is the amount and type of land of the hacienda?

Use	Level	Hill	Broken
Cultivated			
In Rest			
Pasture			

18. As compared with ten years ago, does the hacienda today have more land?

1. yes
2. no

19. Is any of the hacienda land irrigated?

1. yes
2. no

(If the answer is YES)

What type of land?

1. Pasture_____ (Hectares)
2. Cultivated_____ (Hectares)

20. What amount and type of land did the hacienda irrigate ten years ago?_____

21. What type and amount of fertilizer did the hacienda use last year?

Type	Number of Pounds	Price per Pound
Animal		
Mineral		
Synthetic		

22. The amount of fertilizer used today as compared with ten years ago is?

1. equal
2. more
3. less

23. Production and Disposition of Staple Crops During the Agricultural Year 1964-1965:

	Potatoes	Cañahua	Quinua	Habas	Barley	Oca	Other
Number of Hectares Cultivated							
Amount of Seed Used (lbs.)							
Amount Consumed in Household (lbs.)							
Amount Sold in the Market (lbs.)							
Price Per Pound Sold							
Amount Retained For Seed (lbs.)							

24. The land cultivated for the hacienda, is it:

1. joined
2. fragmented

25. Does the hacienda cultivate more land today than it did ten years ago?

1. yes_____ (explain)
2. no

26. Number, Production, and Disposition of Animals:

	TOTAL NUMBER							
	Cattle			Sheep				
	Bulls	Cows	Calves	Rams	Ewes	Lambs	Llama	Alpaca
Presently Own								
Consumed Last Year								
Sold Last Year								
Price Per Animal Sold								
Purchased Last Year								
Price Per Animal Purchased								
Born Last Year								
Died Last Year								

	TOTAL NUMBER					
		Burros			Rabbits and	
	Horses	and Mules	Fowl	Pigs	Guinea Pigs	Other
Presently Own						
Consumed Last Year						
Sold Last Year						
Price Per Animal Sold						
Purchased Last Year						
Price Per Animal Purchased						
Born Last Year						
Died Last Year						

27. Breed of Animals:

	Percentages	
Type	Cattle	Sheep
Pure Race		
Mixed-Breed		
Criollo (native)		

28. As compared with ten years ago, the total number of animals is:

1. equal
2. little more
3. little less
4. twice as many
5. half as many
6. other_____

29. Production and Disposition of Animal Products:

	Wool						
	Sheep	Llama	Alpaca	Milk	Cheese	Hides	Other
Produced Last Year							
Consumed Last Year							
Sold Last Year							
Price Per Sale							

30. To whom does the hacienda sell its products?_____

31. Where does the hacienda sell its products?_____

32. What is the means of transportation used to convey these products to market?_____

33. Types, Number, and Other Information on the Agricultural Equipment Used:

Type	Number Owned	Year Bought or Made
Native Plow		
Spades (hoes)		
Native Spades		
Axes		
Picks		
Shovels		
Wheelbarrows		
Native Mattock		
Rakes		
Steel Poles (for breaking ground)		
Tractors		
Disc Plows		
Cultivators		
Harrowers		
Trucks		
Trailers		
Sheep Shearers		
Wool Presses		
Water Pumps		
Mechanical Mules		
Motors for Electric Light		
Veterinary Instruments		
Other		

34. Did you borrow any equipment last year?

Type	Number	Number of Days Borrowed	Rent Per Day

35. The amount of equipment you have today as compared with ten years ago is:

1. equal
2. more
3. less
4. other _____
(explain)

36. Total New Construction on the Hacienda Within the Last Ten Years:

	New or Replacement Construction	Number of Laborers Used	Machinery Used	Time Needed for Construction	Money Invested
Houses					
Other Buildings					
Fences					
Water Wells					
Water Dams					
Irrigation Ditches					
Other					

37. What is the total indebtedness of the hacienda? _____

38. To whom is the debt owed?_____

39. How much did the hacienda owe ten years ago?_____

40. Did the hacienda rent any of its land last year?

1. yes_____ (explain)

2. no

41. What agricultural extension institutions aided the hacienda within the last ten years, and what type of aid was extended?

Institution	Type of Assistance

Appendix C: Distribution of Livestock on the Four Peruvian Haciendas, Number in Existence at Time of Interview, Also Number Consumed, Sold, Born, and Died during Previous Livestock Year

Sheep

	Campesinos[a]			Hacendados			Total		
	Rams	Ewes	Lambs	Rams	Ewes	Lambs	Rams	Ewes	Lambs
Existing	91	7,891	1,153	11,950	32,105	8,900	12,041	39,996	10,053
Consumed	4	1,338	10	280	728	-	284	2,066	10
Sold	4	401	-	3,183	3,816	250	3,187	4,217	250
Born	-	-	2,027	-	-	12,295	-	-	14,322
Died	-	708	1,221	878	2,401	4,848	878	3,109	6,069

[a]The campesinos interviewed represent 95% of the total number on the haciendas.

Cattle

	Campesinos			Hacendados			Total		
	Bulls	Cows	Calves	Bulls	Cows	Calves	Bulls	Cows	Calves
Existing	129	868	273	37	856	619	166	1,724	892
Consumed	-	3	-	1	-	-	1	3	-
Sold	56	44	-	137	116	15	193	160	15
Born	-	-	205	-	-	293	-	-	498
Died	9	120	67	12	43	39	21	163	106

Alpaca and Llama

	Campesinos		Hacendados		Total	
	Alpaca	Llama	Alpaca	Llama	Alpaca	Llama
Existing	578	306	236	-	814	306
Consumed	60	44	13	-	73	44
Sold	-	9	-	-	-	9
Born	119	82	30	-	149	82
Died	65	35	14	-	79	35

Horses and Burros

	Campesinos		Hacendados		Total	
	Horses	Burros	Horses	Burros	Horses	Burros
Existing	367	218	115	?	482	225
Sold	17	11	-	-	17	11
Born	37	19	8	-	45	19
Died	70	43	14	-	84	43

Miscellaneous Animals

	Campesinos			Hacendados			Total		
	Fowl	Pigs	Guinea Pigs	Fowl	Pigs	Guinea Pigs	Fowl	Pigs	Guinea Pigs
Existing	242	58	17	41	7	40	283	65	57
Consumed	4	3	-	-	-	-	4	3	-
Born	-	5	3	-	-	-	-	5	3
Died	8	1	3	-	5	-	8	6	3

Appendix D: Crop Production of the Four Peruvian Haciendas for the Agricultural Year 1964-1965, Hectares Sown, Seed Used, Amount Consumed, Sold, and Retained for Seed

Potatoes

	Campesinos[a]	Hacendados[b]	Total
Hectares Sown	9.0	24.5	33.5
Seed Used (lbs.)	26,104	71,819	97,923
Harvested (lbs.)	42,822	246,790	289,612
Consumed (lbs.)	25,775	109,846	135,621
Sold (lbs.)	-	50,000	50,000
Retained for Seed (lbs.)	17,047	86,944	103,991

[a]The campesinos interviewed represent 95% of the total number on the haciendas.

[b]Production data for one hacendado not included in all these figures on crop production.

Cañahua

	Campesinos	Hacendados	Total
Hectares Sown	5.2	3.5	8.7
Seed Used (lbs.)	971	271	1,242
Harvested (lbs.)	11,580	2,710	14,290
Consumed (lbs.)	10,843	2,439	13,282
Retained for Seed (lbs.)	737	271	1,008

Quinua

	Campesinos	Hacendados	Total
Hectares Sown	5.3	9.0	14.3
Seed Used (lbs.)	1,008	1,175	2,183
Harvested (lbs.)	9,620	19,130	28,750
Consumed (lbs.)	9,051	4,920	13,971
Sold (lbs.)	-	12,930	12,930
Retained for Seed (lbs.)	569	1,280	1,849

Barley

	Campesinos	Hacendados	Total
Hectares Sown	3.5	15.0	18.5
Seed Used (lbs.)	2,086	9,790	11,875
Harvested (lbs.)		72,440	73,990
Consumed (lbs.)		72,110	73,348
Retained for Seed (lbs.)		330	642

Oca and Alfalfa

	Campesinos Only Oca	Hacendados Only Alfalfa
Hectares Sown	.2	2.0
Seed Used (lbs.)	225	75
Harvested (lbs.)	200	10,000
Consumed (lbs.)	125	10,000
Retained for Seed (lbs.)	75	-

Appendix E: Distribution of Livestock on the Four Bolivian Ex-haciendas, Number in Existence at Time of Interview, Also Number Consumed, Sold, Born, and Died during Previous Livestock Year

Sheep

	Campesinos[b]			Cooperative[a]			Total		
	Rams	Ewes	Lambs	Rams	Ewes	Lambs	Rams	Ewes	Lambs
Existing	1,235	2,352	952	78	140	103	1,313	2,492	1,055
Consumed	300	289	14	3	7	-	303	296	14
Sold	284	134	-	11	64	-	295	198	-
Born	-	-	1,082	-	-	154	-	-	1,236
Died	136	374	441	4	14	27	140	388	468

[a]Ex-Hacienda I only

[b]The campesinos interviewed represent 25% of all campesinos on the ex-haciendas.

Cattle

	Campesinos			Cooperative[a]			Total		
	Bulls	Cows	Calves	Bulls	Cows	Calves	Bulls	Cows	Calves
Existing	192	250	145	7	7	3	199	257	148
Consumed	1	8	1	-	-	-	1	8	1
Sold	93	11	4	1	1	-	94	12	4
Born	-	-	133	-	-	2	-	-	135
Died	8	11	18	-	-	-	8	11	18

[a]Ex-Hacienda I only

Alpaca, Llama, Horses, and Burros

	Campesinos Only			
	Alpaca	Llama	Horses	Burros
Existing	-	363	4	95
Consumed	-	13	-	-
Sold	-	96	1	4
Born	-	32	-	3
Died	-	37	-	-

Miscellaneous Animals

	Campesinos			Cooperatives[a]			Total		
	Fowl	Pigs	Guinea Pigs	Fowl	Pigs	Guinea Pigs	Fowl	Pigs	Guinea Pigs
Existing	376	434	405	-	13	-	376	447	405
Consumed	15	22	220	-	-	-	15	22	220
Sold	28	91	32	-	5	-	28	96	32
Born	91	220	268	-	4	-	91	224	268
Died	43	48	70	-	3	-	43	51	70

[a] Ex-Hacienda I only

Appendix F: Crop Production of the Four Bolivian Ex-Haciendas for the Agricultural Year 1964-1965, Hectares Sown, Seed Used, Amount Consumed, Sold, and Retained for Seed

Potatoes

	Campesinos[a]	Campesino Cooperatives	Total
Hectares Sown	68.38	1.75	70.13
Seed Used (lbs.)	82,055	2,740	84,795
Harvested (lbs.)	303,750	11,420	315,170
Consumed (lbs.)	217,300	4,800	222,100
Sold (lbs.)	3,450	1,600	5,050
Retained for Seed (lbs.)	83,000	5,020	88,020

[a]The campesinos interviewed represent 25% of all campesinos on the ex-haciendas.

Barley

	Campesinos	Campesino Cooperatives	Total
Hectares Sown	54.34	1.16	55.50
Seed Used (lbs.)	14,139	690	14,829
Harvested (lbs.)	183,850	3,406	187,256
Consumed (lbs.)	177,855	-	177,855
Sold (lbs.)	450	2,000	2,450
Retained for Seed (lbs.)	5,545	1,406	6,951

Oca and Habas

	Campesinos		Campesino Cooperative[a]		Total	
	Habas	Oca	Habas	Oca	Habas	Oca
Hectares Sown	15.35	19.24	.95	.50	16.30	19.74
Seed Used (lbs.)	6,700	31,680	760	570	7,460	32,250
Harvested (lbs.)	40,950	165,700	3,800	1,900	44,750	167,600
Consumed (lbs.)	32,295	130,095	-	-	32,295	130,095
Sold (lbs.)	1,900	2,525	-	-	1,900	2,525
Retained for Seed (lbs.)	6,755	33,080	3,800	1,900	10,555	34,980

[a]Ex-Hacienda I only

Quinua

	Campesinos	Campesino Cooperative[a]	Total
Hectares Sown	7.15	.38	7.53
Seed Used (lbs.)	523	19	542
Harvested (lbs.)	11,280	304	11,584
Consumed (lbs.)	10,590	-	10,590
Sold (lbs.)	400	266	666
Retained for Seed (lbs.)	290	38	328

[a]Ex-Hacienda III only

Miscellaneous Production

	Campesinos Only		
	Onions	Oats	Cañahua
Hectares Sown	.79	4.50	11.70
Seed Used (lbs.)	6	429	949
Harvested (lbs.)	4,100	9,000	11,207
Consumed (lbs.)	-	9,000	11,105
Sold (lbs.)	4,096	-	-
Retained for Seed (lbs.)	4	-	102

Appendix G: Amount and Average Prices (in Dollars) of Products Sold and Consumed on Four Peruvian Haciendas (including estimates for output of those campesinos not interviewed)

	Campesinos		Hacendados	
Products	Amounts[a]	(Average Unit Price)[b]	Amounts	(Average Unit Price)[b]
Sheep				
Rams	9	(3.75)	3,463	(6.05)
Ewes	1,825	(2.80)	4,544	(5.40)
Lambs	11	(1.40)[c]	250	(2.70)
Cattle				
Bulls	59	(45.65)	138	(50.60)
Cows	49	(30.70)	116	(58.15)
Calves	-	-	15	(44.75)
Llamas and Alpacas	119	(5.10)	13	(5.10)[d]
Pigs	3	(6.75)	-	-
Alpaca Wool	300 lbs.[f]	(0.26)	2,300 lbs.	(0.48)
Sheep Wool	800 lbs.[f]	(0.15)	155,590 lbs.[e]	(0.41)
Milk	-	-	116,221 qts.	(0.08)
Cheese	6,000 lbs.[f]	(0.55)[d]	5,795 lbs.	(0.55)
Hides	1,700[f]	(1.50)[d]	2,300	(1.50)
Potatoes	27,063 lbs.	(0.025)[d]	159,846 lbs.[g]	(0.025)
Quinua	9,504 lbs.	(0.03)[d]	17,850 lbs.[g]	(0.03)
Cañahua	11,385 lbs.	(0.03)[d]	2,439 lbs.[g]	(0.03)
Barley	17,000 lbs.[f]	(0.025)[d]	72,110 lbs.[g]	(0.025)

[a] Total amounts sold and consumed are based upon the statistical averages of those campesinos interviewed. See Appendices C and D.

[b] All prices are those received in the market for products sold except where indicated.

[c] Estimated price based upon the assumption that a lamb, on the average, is worth half the value of an ewe.

[d] Imputed value based upon the market prices received by the campesinos or hacendados.

[e] An estimated 95,000 of this figure is an imputed amount for Hacienda I based upon the number of sheep and average yield.

[f] These figures are estimates based upon the number of animals, hectares cultivated, and average yields.

[g] Crop production information for one hacendado not included in these figures.

Appendix H: Amounts and Average Prices (in Dollars) of Products Sold and Consumed on Four Bolivian Ex-haciendas (including estimates for output of those campesinos not interviewed)

Products	Campesino Cooperatives Amounts	(Average Unit Price)[b]	Campesinos Amounts[a]	(Average Unit Price[b]
Sheep				
Rams	36	(7.25)	2,336	(4.65)
Ewes	186	(4.60)	1,692	(4.30)
Lambs	-	-	56	(2.15)[c]
Cattle				
Bulls	1	(66.65)	376	(65.40)
Cows	2	(75.00)	76	(43.25)
Calves	-	-	20	(39.35)
Llamas	-	-	436	(8.40)
Pigs	13	(6.75)[d]	472	(6.75)
Sheep Wool	1,900 lbs.	(0.25)	5,896 lbs.	(0.25)[d]
Cheese	1,050 lbs.	(0.50)	49,912 lbs.	(0.40)
Hides	379	(1.90)	3,220	(1.85)
Potatoes	16,000 lbs.	(0.03)	883,000 lbs.	(0.03)
Quinua	700 lbs.	(0.03)	43,960 lbs.	(0.025)
Cañahua	-	-	44,420 lbs.	(0.025)
Barley	5,000 lbs.	(0.025)	713,220 lbs.	(0.02)
Habas	-	-	136,780 lbs.	(0.035)
Oca	-	-	530,048 lbs.	(0.03)

[a]Total amounts sold and consumed are based upon the statistical averages of those campesinos interviewed. See Appendices E and F.

[b]All prices are those received in the market for products sold except where indicated.

[c]Estimated price based upon the assumption that a lamb, on the average, is worth half the value of a ewe.

[d]Imputed prices based upon the market prices received by the campesinos or cooperatives.

Appendix J: Logarithmic Production Functions of Peruvian Haciendas and Bolivian Campesino Farms

A. Production Function of Bolivian Campesino Farms

A sample of the campesinos interviewed on the four Bolivian ex-haciendas were chosen for analysis.[1] The equation selected to study the relationship between gross value output (income) and inputs was:

$$Y = a X_1^{b1} + X_2^{b2} + X_3^{b3} + X_4^{b4}$$

Y = gross value (pesos) of products sold and consumed
X_1 = hectares cultivated
X_2 = hectares in pasture
X_3 = man-year equivalents of labor
X_4 = value (pesos) of livestock capital
b's = elasticities of production

TABLE 1

COEFFICIENTS OF CORRELATION OF THE FACTORS OF PRODUCTION FOR FOUR BOLIVIAN EX-HACIENDAS (percentage response of value output to a one percent increase of the factors of production)

Ex-Haciendas	Elasticities of Production: Area Cultivated	Livestock Capital	Labor (man-years)	Area Pasture	Statistical "F" Test on "R^2"
I	.393[b]	.489[a]	.358[b]	.098[c]	35[a]
II	.400[c]	.395[c]	.413	.647[b]	7[a]
III	.017	.515[b]	.178	.030	6[a]
IV	-.370	.180	.236	-7.857	1[c]
Sum of four Ex-Haciendas	.442[a]	.463[a]	.296[b]	-.019	41[a]

[a]Statistically significant at the 1% level.

[b]Statistically significant at the 5% level.

[c]Statistically significant at the 10% level.

[1]Of the total number, 98 campesino farms were selected on the basis of the reliability and completeness of their production information:

Ex-hacienda I = 38
Ex-hacienda II = 15
Ex-hacienda III = 30
Ex-hacienda IV = 15

The derived production function for these campesino farms of the four Bolivian ex-haciendas is:

$$Y = 3.918\ X_1^{0.442}\ X_2^{-0.019}\ X_3^{0.296}\ X_4^{0.463}$$

Standard Errors .09 .03 .10 .08

$R^2 = .64$

The production function is useful in determining returns to scale and provides an indication of the long-run size which enables the lowest cost per unit of output.[2] The logarithmic function expresses directly the production elasticities. Each exponent (b_1) shows the percent by which production (Y) increases for each 1% increase in the use of a particular resource; the sum of these exponents indicates the percentage increase in output when all resources are increased by 1%. The sum of the elacticities (b's) is 1.18 which indicates slightly increasing returns to scale. Increasing all inputs by 1% will increase output by 1.18%. Although the results obtained for the input "area in pasture" (X_2) are not statistically significant, the indications are that an increase of this one factor by 1% will not increase value output.

Another use of this production function is the computation of marginal value products with the aid of the geometric mean values of the variables. The marginal value product is the increase in the total value product gained by adding another unit of a particular input. Thus, it is an estimate of the earning power of inputs. If capital is limited, profit

[2]For a discussion of these type production functions, see Cobb, Charles W., and Douglas, Paul H., "Theory of Production," American Economic Review, 18: 139-165, March, 1928. Bronfenbrenner, M., "Production Functions: Cobb-Douglas, interfirm, intrafirm." Econometrica, 12: 35-44, January, 1944. Heady, Earl O., Johnson, Glenn L., Hardin, Lowell S. Resource Productivity, Returns to Scale and Farm Size, Iowa State College Press (Ames, Iowa: 1956).

is maximized where the marginal value products are equal. If capital is unlimited, it will pay the producer to add inputs until the increase in value product for the last unit added equals its increased cost. The estimated marginal value products of the different inputs are given in Table 2.

TABLE 2

MARGINAL VALUE PRODUCTS OF THE FACTORS OF PRODUCTION ON THE FOUR BOLIVIAN EX-HACIENDAS (additional value output for each one unit addition to the "average quantity" of input)

Inputs	Average Amounts[a]	Marginal Value Products[b]
Livestock capital	$314.60	33 percent
Hectares cultivated	1.1 hectares	$88.71 per hectare
Labor (man-years)	2.9 man-years	$22.65 per year
Hectares in pasture	3.0 hectares	-[c]

[a]The "average amounts" are the geometric averages of inputs on the campesino farms.

[b]The marginal value products are computed by multiplying the regression coefficients (elasticities) for each input by a ratio of the geometric mean of gross output to the geometric mean of the specified input. The geometric mean value of gross sales is $220.80.

[c]The computed negative $1 figure is not economically or significantly different from zero.

The costs of these inputs for the typical campesino are not market prices, but opportunity costs. Consequently, the rigor of this analysis cannot be easily extended. However, a few general comments can be made. The indications are that it would pay the Bolivian campesinos to cultivate a greater proportion of their sayañas since the marginal

value product of pasture land is zero while that of the cultivated land is $88.71. Although this last figure was not computed from the same sample as the average value production figure of $88.45 in Table 22 on page 88 of this paper, the implication is that an additional marginal increment of land under cultivation would not decrease the average return. Of course, increased cultivation would require additional labor. But labor is not being fully utilized on these small farms.

The high percentage return on investment in livestock seems to indicate that investment in livestock would be profitable. The problem of obtaining credit is, unfortunately, insoluble from the point of view of the individual campesino. Apparently this is a situation which merits the consideration of the credit extension agencies. The additional problem of overgrazing will be discussed later. It need only be said that cultivated pastures are excellent substitutes for natural pastures.

The important conclusion to be drawn from this marginal analysis is that increased cultivation of land, including forage crops, combined with investment in livestock could result in a fuller utilization of labor. This, in turn, would give rise to a greater marginal value product of labor. With existing technological methods and size of farm, this reallocation of resources and investment would result in a greater value output (income). This would be more economical than increasing all factors of production at the margin because of the low marginal returns to pasture land and labor relative to cultivated land and livestock.[3] Of course, marginal analysis can tell us nothing about the

[3]Dr. Dean F. Schreiner, an economist with the USAID Mission to Peru, did a similar analysis of small farms in the Department of Puno. Many of his findings are remarkably close to those above. See Recursos Naturales del Departamento de Puno, pp. 58-98.

effect of using advanced techniques of production or of doubling or tripling inputs.

B. Livestock Production Function of Peruvian Haciendas

Unfortunately, only four haciendas were studied in the field, which is an insufficient number with which to compute a production function. Combining these four Peruvian haciendas with 18 others in the Department of Puno and 22 from the Departments of Pasco and Junín in Central Peru enabled this writer to derive a livestock production function for 44 Peruvian haciendas.[4] This is the dictate of the available data. The equation used was of the form:

$$Y = a X_1^{b_1} + X_2^{b_2} + X_3^{b_3}$$

Y = gross value (in thousands of soles) of the animal products meat and wool sold and consumed
X_1 = area of land in hectares
X_2 = man-year equivalents of labor
X_3 = value (in thousands of soles) of livestock capital
b's = elasticities of production

[4] The exclusion of all cultivated products and animal products such as cheese and hides restricts the usefulness of this function, but as seen in Table 21 on page 87 of this paper, these products only account for between 10% and 20% of all production on these estates. In addition, the inputs and output are exclusively those of the hacendados.

TABLE 3

COEFFICIENTS OF CORRELATION OF THE FACTORS OF PRODUCTION FOR 44 PERUVIAN HACIENDAS (percentage response of value output of animal products to a one percent increase in the factors of production)

Departmental Location of Haciendas	Elasticities of Production			Statistical "F" Test on "R^2"
	Livestock Capital	Labor (man-years)	Total Land Area	
Puno[d]	1.057[a]	.064	-.002	71[a]
Pasco and Junín[e]	.712[b]	.498[c]	.176	14[a]
Sum of Haciendas	.927[a]	.249[c]	.052	98[a]

[a]Statistically significant at the 1% level.

[b]Statistically significant at the 5% level.

[c]Statistically significant at the 10% level.

[d]Source: Sample Study of Haciendas in the Department of Puno, Peru, including the four haciendas interviewed.

[e]Source: Peru: Informe para el Instituto de Reforma Agraria y Colonización, Dr. Abel Caldarón Vera (Lima: April, 1962). (Unpublished.)

The derived production function for these 44 Peruvian haciendas is:

$$Y = -1.850 \quad X_1^{0.052} \quad X_2^{0.249} \quad X_3^{0.927}$$

Standard errors .11 .14 .13

$R^2 = .88$

The limitations of such a production function are many. Nevertheless, a number of interesting relationships are exposed. For example, the sum of the production elasticities is 1.23, which indicates increasing returns to scale. However, more discussion must await the computations of the marginal value products of the inputs. The estimates of which are given in Table 4.

TABLE 4

MARGINAL VALUE PRODUCTS OF THE FACTORS OF PRODUCTION OF THE PERUVIAN HACIENDAS (additional value output for each one unit addition to the "average quantity" of input)

Inputs	Average Amounts[a]	Marginal Value Products[b]
Livestock capital	$73,065	42 percent
Labor (man-years)	94 man-years	$86.91
Total land area	9,808 hectares	-[c]

[a]The "average amounts" are the geometric averages of inputs on the haciendas.

[b]The "marginal value products" are computed by multiplying the regression coefficients (elasticities) for each input by a ratio of the geometric mean of gross output to the geometric mean of the specified input. The geometric mean value of gross output is $32,790.

[c]The computed $.17 figure is not economically or significantly different from zero.

It would seem that rational economic behavior dictates a greater investment in livestock because of its high return. These estates are not greatly limited in their access to capital. For example, the four haciendas studied in the field had a total indebtedness of only $25,000. The annual interest rate at the Bolivian Agriculture Bank is 9%, which is substantially lower than the 42% return on investment in livestock. But is it possible to increase the number of livestock without increasing the labor and land inputs? According to the Peruvian agronomists, the natural pasture capacity maximum U.A.O. per hectare in the Department of Puno is 2.1 and is as low as .06 on non-irrigated, high grazing land. Since the U.A.O. density is nearly 3.0 on these haciendas, these lands are presently being overgrazed which, in the long-run, will result in the

destruction of the natural pastures. Thus, the hacendados can increase their herds of sheep and cattle only if they simultaneously increase their land area or improve the existing pastures. The cost of additional units of land in the Department of Puno varies between $24 and $56 per hectare for land capable of supporting 3 U.A.O.'s.[5] Consequently it would not pay to add hectares of pasture land alone, and increasing both livestock and land would have the effect of greatly reducing the 42% return to livestock investment. This figure is further reduced due to the need of adding labor to each increment of land and livestock. Because the Peruvian campesino already has in his care an average of 500 U.A.O.'s, it would be extremely difficult to increase the number of livestock without also increasing the number of laborers. Presently, the haciendas are efficiently utilizing the labor (man-year) input since the estimated marginal value product of $87 is nearly equal to the estimated marginal value cost of $105.[6] A plausible solution to this apparent dilemma would be for the hacendados to improve their pasture lands by irrigation and/or cultivation. Here again, marginal analysis can provide no clues as to the expected return from non-traditional inputs such as fences, quality livestock, and similar type capital. In addition, this analysis does not provide any clues to what action the haciendas should take in respect to cultivation of such crops as potatoes, quinua, etc. The relatively high average value productivity of such cultivated land combined with the small number of hectares cultivated does seem to indicate that an increase in this production activity should be given consideration, however.

[5]These prices are estimates of the value of the land made by the Oficina Nacional de la Reforma Agraria in Puno, and the Cuerpo Técnico de Tasaciones de Perú in Lima.

[6]The estimated marginal value cost is the average money wage per worker, see Appendix K.

Appendix K: Peruvian Campesino Wages in Dollars (including those campesinos not interviewed)

	HACIENDAS				
	I	II	III	IV	Total
Gross Wages of Interviewed Campesinos	3,015	557	3,897	12,801	20,270
Plus: Gross Wages of Campesinos not Interviewed	82	-	163	873	1,118
	3,097	557	4,060	13,674	21,388
Less 4% Taxes	124	22	162	547	855
	2,973	535	3,898	13,127	20,533
Less Fees for Use of Pasture and Cultivatable Land of Haciendas	1,592	-	720	-	2,312
Net Campesino Wages	1,381	535	3,178	13,127	18,221

Appendix L: Distribution of Indebtedness of Those Campesinos Interviewed in Dollars

PERU

To Whom Indebted	Campesinos Number in Debt	Campesinos Amount of Debts	Haciendas Number in Debt	Haciendas Amount of Debts	Total Number in Debt	Total Amount of Debts
Administrator	5	150	-	-	5	150
Friends and Neighbors	20	480	-	-	20	480
Families	8	280	-	-	8	280
Businessmen	5	105	-	-	5	105
Agricultural Banks	1	225	2	25,000	3	25,225
Total	39	1,240	2	25,000	41	26,240

BOLIVIA

To Whom Indebted	Campesinos Number in debt	Campesinos Amount of debts	Campesino Cooperative (Ex-hacienda I only) Number in debt	Campesino Cooperative (Ex-hacienda I only) Amount of debts	Total Number in debt	Total Amount of debts
Friends and Neighbors	25	257	-	-	25	257
Families	6	43	-	-	6	43
Businessmen	2	24	-	-	2	24
Agricultural Banks	1	333	1	15,825	2	16,158
Total	34	657	1	15,825	35	16,482

Appendix M: Distribution of School Attendance in the Bolivian Ex-Haciendas and Peruvian Haciendas Sampled

	Peru			Bolivia		
	Male	Female	Combined	Male	Female	Combined
Number of persons who are attending or had attended school	220	91	311	253	116	369
Number of children presently attending school	135	67	202	125	57	182
Number of school-age children (between 6-17 inclusive)	179	156	335	165	144	309

Highest Education Achieved of those Who Are Attending School and Those Who Had Attended School of Bolivian and Peruvian Campesinos Interviewed

Number of Persons	Number of School Years Completed											
	1	2	3	4	5	6	7	8	9	10	11	12
Peru												
Male	94	48	26	16	20	5	4	1	3	2	1	-
Female	61	19	3	6	-	-	1	-	-	1	-	-
Combined	155	67	29	22	20	5	5	1	3	3	1	-
Bolivia												
Male	58	44	47	35	30	36	2	-	-	-	1	-
Female	53	31	22	6	3	1	-	-	-	-	-	-
Combined	111	75	69	41	33	37	2	-	-	-	1	-

Appendix N: Bolivia's Post-Revolutionary Petroleum Industry

The Petroleum Code of 1956 made it possible for a number of international oil companies, such as Standard, Shell, and Gulf, to engage in the exploitation of Bolivia's largely-untapped oil reserves. Developmental loans also made possible the construction of refineries and pipelines, as well as a general expansion of the Y.P.F.B., Bolivia's national oil company. The result was an increase in the national output sufficient to meet the increased needs of the nation and even to export a small surplus. However, the tremendous increase of the last decade has slowed up in recent years.

PRODUCTION AND EXPORT INDICES OF PETROLEUM 1952 TO 1964

	Crude Output	Refined Output	Exports
1952[a]	100	100	100
1953	114	102	91
1954	322	349	116
1955	512	475	773
1956	608	627	957
1957	680	571	1,552
1958	654	527	1,720
1959	603	493	1,195
1960	680	505	1,420
1961	569	501	874
1962	435	606	598
1963	625	598	847
1964	609	657	350

[a]In absolute figures, Bolivia produced 83,586 cubic meters of crude oil and refined 71,243 cubic meters of this amount in 1952. Exports totaled 12,736,000 liters.

Source: Bolivia, Banco Central de Bolivia, Sección Estudios Económicas y Estadística, Boletín Estadístico, #173, December, 1965, pp. 50-51.

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