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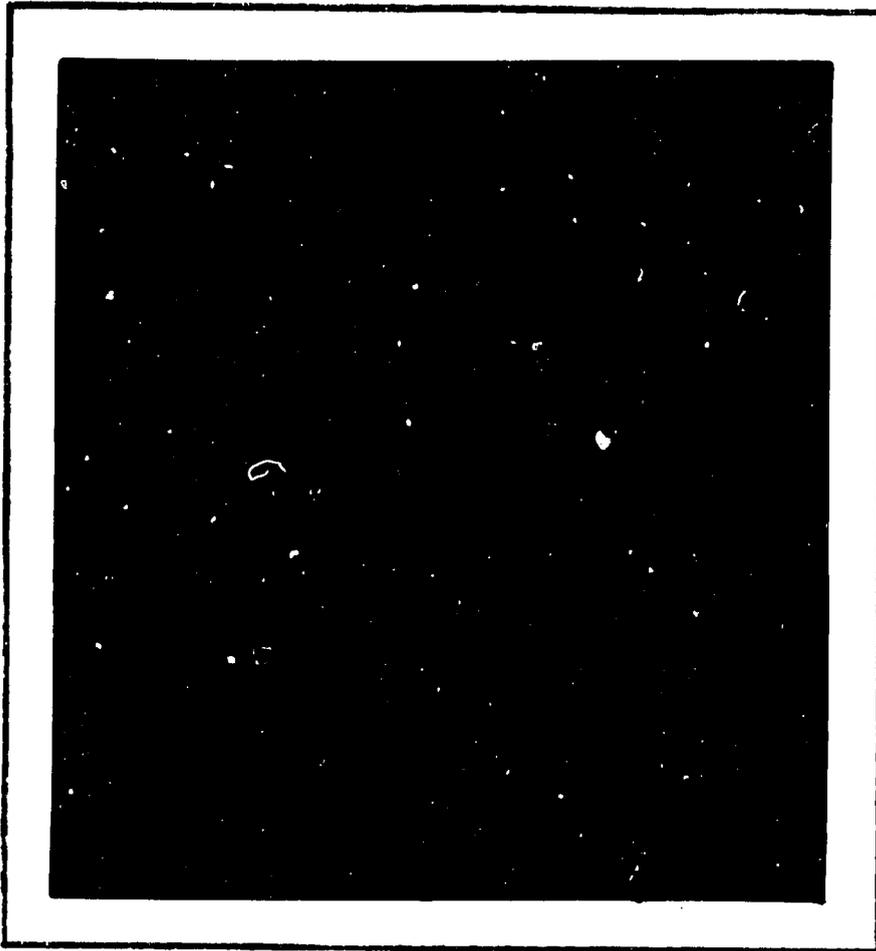
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RURAL INCOME DISTRIBUTION IN BOLIVIA:
A SUMMARY AND EVALUATION OF
QUANTITATIVE AND QUALITATIVE
INFORMATION

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This paper summarizes and evaluates the available quantitative and qualitative information on rural income distribution in Bolivia. Data both at the national level and for specific communities or regions will be presented and discussed. Income distribution policy will be reviewed, and suggestions will be made for future research. ^{*/}

NATIONAL ACCOUNTS DATA IN BOLIVIA

Before examining the data on income distribution, it is useful to comment on the quality of the statistics on national income and output. The national accounts data, as might be expected for one of the poorest countries in the hemisphere, are less reliable than those for most other Latin American countries (Whitehead 1969). Value added in agriculture, for example, is based on a 1958 survey (Bolivia, SAI, 1958-60) which is seriously defective in a number of respects. In the first place, the survey covered only 44 of 85 provinces in the 7 largest Departments (the Beni and Pando were excluded), and only a few cantones were examined in each province. As Whitehead (1969: 207) points out,

this would normally be respectable sampling procedure, but Bolivia lacks reliable information on the population of each department and province, let alone each cantón, and so there is no sound basis for expanding the results from each unit surveyed, to obtain national totals. ^{1/}

^{*/}

I am indebted to Allen LeBaron for his careful reading of an earlier draft of this paper. Factual errors he spotted have been corrected, and many of his other suggestions have been incorporated into this final version. Comments from John Daly, Dwight Heath, and James Rioridan are also appreciated. Any remaining errors of fact or interpretation are my responsibility.

^{1/}

Cantonal boundaries are rather fuzzy, and according to Whitehead the government does not even have a complete register of cantones.

Production totals are obtained by multiplying rough estimates of yields per hectare by rough estimates of hectares in production. Prices paid to producers (for which data also are poor) are then applied to physical output data, and 14.47 percent is deducted to obtain value added. Whitehead was unable to determine how this deduction for inputs was computed, but in any event it seems too low. ^{2/} If so, this means that value added in agriculture, other things equal, is overestimated. In addition, it has been argued that the volume of production estimated by the 1958 survey was too high (Deere 1970: 1), though this judgment is not shared by all qualified observers.

Until 1970, the 1958 agricultural survey was used as the basis for estimating or extrapolating agricultural production in future years, since agricultural extension agents were not collecting annual production data as they were supposed to be doing. ^{3/} The 14.47 percent deduction for inputs continued to be used, thus ignoring possible changes over time in the internal terms of trade and the productivity of inputs. To make matters worse the constant-price data, obtained by applying 1958 producer-

^{2/}

In Ecuador, where the level of agricultural technology is not much higher than in Bolivia, the value of agricultural inputs is estimated (again mysteriously) to be 35 percent of market value, which means an even higher percentage with respect to producers' prices (Zuvekas, "Determining Agricultural Sector Growth Rates in Less Developed Countries: The Case of Ecuador," Inter-American Economic Affairs 27, No. 2 [Autumn 1973]: 69). Given the much greater importance of export agriculture in Ecuador than in Bolivia (especially before 1970), one might expect the percentage deducted for inputs to be higher. But it is doubtful that the gap is as great as these figures imply.

^{3/}

The Ministry of Agriculture and the Secretaría de Planificación each had its own series, based either on guesswork or extrapolations (Whitehead 1969: 208-210). A third series was used by the Ministry of Economy (Deere 1970: 1-2).

price weights to production volumes, was converted to current prices by using the consumer price index for La Paz, which Whitehead (1969) demonstrates to be "hopelessly inadequate."

In 1963 another agricultural survey was conducted, though again the lack of data made it difficult to prepare an adequate sample frame. The U.N. advisor associated with this effort has defended the results as being more reliable than the previous data (Muñoz 1965); but other observers generally have come to the opposite conclusion, and the results of the 1963 survey were officially rejected.

In 1970 a joint study (Deere 1970) was undertaken by the Ministry of Agriculture's Budget and Planning Office and the Rural Development Division of USAID/Bolivia to review all available data on agricultural production and to seek agreement among various Bolivian government agencies on a single series for agricultural production. As a result, the Ministries of Agriculture, Planning, and Economy settled on a common series for 1961-68, based either on individual crop surveys conducted during 1967-69 or on figures from one of the three competing series used by the different ministries.

The new production data, which generally are no longer based on the 1958 survey, still are quite deficient. For many commodities, production estimates are essentially adjusted extrapolations, as the Ministry of Agriculture has yet to begin systematic surveying on an annual basis. One knowledgeable observer regards the estimates for wheat, yucca, and livestock as being especially poor. Data for sugar, rice, and cotton, however, are probably reasonably accurate, since the government is involved in marketing or the relevant producers' association collects fairly comprehensive data.

One check on the Ministry of Agriculture's production data is provided by a sample survey carried out in 1972 by the Ministry of Agriculture with the assistance of USAID and 2 advisors attached to the Utah State University team in Bolivia (LeBaron, Nogales, and collaborators 1975-). ^{4/} Approximately 2800 families were sampled in this survey, and some 2550 produced significant amounts of agricultural products. Data are available for each of 10 ecological zones and by farm size within each zone. ^{5/} Unfortunately, this survey was plagued by a number of enumeration errors, which necessitated a great deal of editing by hand and machine and affected the reliability of the data. Much of the information has only recently been published or is still unpublished, and it was not possible for this writer to make a detailed comparison of the results with the Ministry of Agriculture's current series. It is sufficient to note that some major discrepancies exist, and that problems with the 1972 survey itself have led the Ministry and its advisors to look for cross-checks to test the accuracy of the survey results.

The foregoing review of agricultural production estimates should suffice to convince the reader of the low level of reliability of output and income data for Bolivian agriculture. Similar problems exist with other components of the GDP (Whitehead 1969). This makes it difficult to place much confidence in any estimate of income distribution. Hopefully, the data situation will be significantly improved by the revisions in the national accounts now being made.

^{4/} Data editing was later contracted to Utah State University.

^{5/} The sampling frame used for the 5 most populous zones was a modified cluster system, with provinces, and then villages, selected at random. In the remaining 5 zones, a stratified random sample was used to take into account differences between large and small farmers/ranchers.

An additional complication, already alluded to, is that population estimates for Bolivia are also unreliable, both with regard to totals and to geographic distribution. Until the September 1976 census, various national and international agencies had projected Bolivia's 1976 population to be 5.5-5.8 million, with the Instituto Nacional de Estadística (INE) using a figure of 5,789,000. The census, however, counted only 4,642,228 people. As usually occurs after a census, there were claims that many people were not counted, and this is undoubtedly true. But even if the census is adjusted upwards by about 10 percent, as was the previous (1950) census, the population would still be significantly lower than had been estimated. As it stands now, the unadjusted population total implies an annual growth rate of 1.7 percent since 1950 (adjusted figure). ^{6/} This suggests that (1) the infant mortality rate may be considerably higher than reported, as many health professionals maintain, and/or (2) emigration, particularly to Argentina, has been greater than the government has estimated. ^{7/}

The census results affected not only estimates of total population but also its geographic distribution. For 8 of the 9 Departments, the census showed the population to be lower than projected, particularly (in percentage terms) in Potosí, Chuquisaca, and Tarija. In Santa Cruz, however, the population was substantially higher in absolute terms than had

^{6/} This is well below the Latin American average of about 2.8 percent. An upward adjustment of 10 percent in the 1976 census would result in an annual growth rate of 2.0 percent.

^{7/} Internal and external migration will be discussed in a subsequent report on employment. It is doubtful that birth rates have declined significantl

been projected, which suggests that eastward migration and spontaneous colonization of the sub-tropical lowlands has been occurring at a far greater rate than had been believed. The implications of the census for income per capita at both the national and regional level will be discussed below.

INCOME DISTRIBUTION: MACROECONOMIC DATA

Prior to the Revolution of 1952, the distribution of agricultural land was extremely unequal, as will be seen later in this section. Undoubtedly, there was also a high degree of inequality in the distribution of income; but just how much inequality existed is difficult to say. An estimate reported by Ferragut (1963: 80-81) for pre-reform Bolivia contends that 90 percent of agricultural income was received by only 3.5 percent of the producers, while the remaining 10 percent of income accrued to 80 percent of them. The arithmetic error here is obvious, but how to correct it is not.

A study of the size distribution of income in 44 less developed countries (Adelman and Morris 1971: 27) shows that income distribution in Bolivia was more unequal than in Latin American countries generally. According to these data (for which years are not specified) ^{8/} the poorest 10 percent of the Bolivian population received only 4 percent of the

^{8/}

In general, the data for the countries studied are from the late 1950s and the 1960s. For 1968, the Ministerio de Planeamiento reported the same figure for the wealthiest 5 percent but only 3.5 percent for the poorest 20 percent. For a discussion of the data collected by Adelman and Morris and of other comparative data for Latin American countries (but not including Bolivia), see Zuvekas 1975.

national income, while the wealthiest 5 percent received 35.7 percent (see Table 1). These data, however, are of dubious reliability, since the Bolivian government appears to have based its estimates largely on income patterns in other Latin American countries at similar levels of development.

The first systematic attempt to determine income distribution was carried out in 1972 as part of the production-consumption surveys of rural and urban areas conducted by the Ministry of Agriculture. The consumption data, which are of better quality than the production data, show a very high degree of inequality in rural income distribution at the national level as measured by the Gini coefficient, which was computed to be .607 (LeBaron, Brown, and Ortíz 1976).^{9/} When the income concentration figure was disaggregated by geographic region, however, the degree of inequality lessened considerably, ranging from .348 to .494 in all regions but the Gran Chaco, where it was .669 (see Table 2).

Gini coefficients for the 7 major urban areas were lower, ranging from .327 to .399; a national urban coefficient was not computed because this would have been too time-consuming by hand and too costly by computer. The rural-urban differentials contrast with those in most LDCs, where rural income tends to be more equally distributed than urban income. This result may be due to the fact that the Bolivian data (urban and rural) use expenditures as a proxy for family income; omitted imputed income for low-income rural families would be relatively high.

While one must bear in mind the weakness of the Bolivian data and the limitations of the Gini coefficient as a measure of income inequality, the available evidence suggests that rural income inequality is indeed a serious

^{9/}

In Ecuador, where average income is not too much higher than in Bolivia, data for 1965 yield a Gini coefficient of .56. (Calculated from Ecuador, Junta Nacional de Planificación y Coordinación Económica, El desarrollo económico del Ecuador, 1970-1973, Vol. II, Part I, p. A.1.12.)

TABLE 1
 SIZE DISTRIBUTION OF INCOME IN BOLIVIA AND OTHER LATIN
 AMERICAN COUNTRIES, VARIOUS YEARS, LATE 1950s AND 1960s
 (percent of total income)

Income Group	Bolivia	Average, ^a 15 Latin American Countries
Poorest 20 percent	4.0	4.9
Poorest 60 percent	26.6	26.0
Middle 40-60 percent	8.9	12.0
Highest 20 percent	59.1	56.0
Highest 5 percent	35.7	31.0

Source: Adelman and Morris (1971: 27).

^a
Unweighted.

TABLE 2

RURAL INCOME CONCENTRATION BY GEOGRAPHIC REGION, 1972

Region	Gini Coefficient
Amazónica	.436
Beni-Moxos	.413
Chiquitana	.457
Santa Cruz	.367
Gran Chaco	.669
Valles	.435
Yungas	.348
Altiplano Norte	.402
Altiplano Central	.494
Altiplano Sur	.396
All Rural Areas	.607

Source: LeBaron, Brown, and Ortíz (1976).

problem at the national level. However, the substantially lower regional coefficients suggest that the major reason for the high national figure might be significant differences in agricultural productivity and incomes among the country's various regions. This can be seen in data to be presented below. Moreover, studies of individual regions and communities, to be discussed later in this paper, suggest that--at least in some areas--a significant redistribution of income and wealth did occur after the Revolution of 1952.

At the same time, the overall picture that emerges is not that of the radical distribution of income and wealth that might have been expected of a revolution which has substantially raised the social status and political power of lower income groups. Moreover, it is quite likely that welfare in many communities, after an initial improvement, increased very little if at all in subsequent years. In some communities, in fact, agricultural productivity and income now appear to be declining; and, particularly on the Altiplano, these are communities which receive little attention from government programs in credit, technical assistance, and marketing. According to one estimate, per capita incomes of small farmers fell by 0.8 percent annually between 1961-65 and 1971-73, and averaged only U.S. \$45 during the latter years (ILO-PREALC: III-18, fn. 1).

Table 3 presents data on rural-urban income differentials for 1958-69, the only years for which such data are available. While significant productivity and income differentials between agricultural and nonagricultural activities can be expected in less developed countries, the gap reported for Bolivia is surprisingly great: during the years in question, national income per capita in urban areas was 6.6-8.5 times that in rural areas.

TABLE 3
 URBAN-RURAL INCOME DIFFERENTIALS, 1958-1969
 (1958 pesos)

Year	National Income per Capita			Urban/Rural Ratio
	Total	Urban	Rural	
1958	770	2,129	273	7.80
1959	760	2,036	289	7.05
1960	780	2,073	298	6.96
1961	790	2,065	309	6.68
1962	835	2,171	327	6.64
1963	844	2,206	323	6.83
1964	918	2,414	342	7.06
1965	903	2,371	331	7.16
1966	1,002	2,626	361	7.27
1967	1,031	2,758	342	8.06
1968	1,049	2,808	338	8.31
1969	1,064	2,845	335	8.50

Source: Bolivia, MINPLAN (1970).

Moreover, the gap widened greatly between 1962 and 1969, which suggests that the degree of income inequality for urban and rural areas combined may have increased during the course of the 1960s. This in turn raises the possibility that a significant redistribution of national income may have occurred in the mid-1950s and early 1960s but then was reversed by subsequent government policies. This hypothesis, unfortunately, would be extremely difficult to test, given the lack of income distribution data for the 1950s.

Additional data for 1969 show the distribution of income according to three very broad occupational categories. Per capita income in that year was reported to be US\$ 1,779 for owners and managers, US\$ 348 for salaried workers, and US\$ 68 for "campesinos and independent workers" (Bolivia, MACA, 1974: 49). Although the latter category includes urban as well as rural workers, the data tell much the same story as those in Table 3.

To this writer, the reported gap between rural and urban incomes seems too high, at least if one includes imputed nonmonetary income, as these figures presumably do. (The average for Latin America in the late 1960s was about 2.5:1.) Nonmonetary income is undoubtedly underestimated for both urban and rural dwellers, but the underestimate is likely to be greater for the latter. Another reason to doubt the size of the gap is the presumed rural-urban population distribution, which the results of the September 1976 census call into question. Specifically, while the census revealed a total population well below projections, the urban population (1,978,525) exceeded the INE's projection (1,787,767). Thus the rural population appears to be significantly less than had been assumed.

For 1969 the overestimate of the rural population is about 33 percent. This would reduce the urban/rural income ratio in that year from 8.50 to 5.35. Moreover, outmigration from rural areas at a more rapid rate than had been projected would mean a slower increase in the urban/rural income ratio than the figures indicate for the 1960s.

Table 4 shows data on rural income differentials among major geographic regions for 1971, based on a survey conducted in that year. Although the quality of the data could not be determined, and it is not known whether the high population estimates affect either absolute income figures or relative income among the regions, the data probably give a reasonably good idea of relative (if not absolute) income levels in various parts of the country. Although the regional data cannot be directly converted to data by Department, they do suggest that rural income differentials among the 9 Departments are wide enough to produce a very high national Gini coefficient and substantially lower coefficients for individual Departments (see above). The data seem to refer to cash income only.

The data in Table 4 show that the lowest-income rural areas are the Southern Altiplano, the Tropical South, and the Central Valleys, all of which are relatively far from major markets and which lack good transportation to those markets. Rural income per family appears to be highest in the Tropical North, the Northern (Cochabamba) Valleys, and the Northern and Southern Sub-Tropics (Santa Cruz). (See Map, p. 73.)

These data are roughly consistent with data on Gross Departmental Product per capita presented in Table 5, though it must be remembered that the data in Table 5 include urban as well as rural income. Using pre-census

TABLE 4
 AVERAGE REMUNERATED FAMILY INCOME IN RURAL AREAS, BY GEOGRAPHIC REGION, 1971
 (pesos)

Region	Estimated Rural Population	Remunerated Family Income	
		Total Rural Income	Agricultural Income
Low Income			
Tropical South	191,000	2,500	2,000
Central Valleys	793,000	3,000	2,000
Southern Altiplano	101,000	2,500	1,500
Middle Income			
Southern Valleys	422,000	5,000	4,000
Northern Altiplano	552,000	5,000	3,000
Central Altiplano	407,000	4,200	3,600
High Income			
Tropical North	237,000	7,000	6,000
Northern Valleys	611,000	8,000	5,500
Sub-Tropical North	281,000	6,000	5,000
Sub-Tropical South	137,000	6,000	6,000

Source: IDB (1973: 227). The nature of the survey on which these data are based is not clear. A note to the table states that it was "compiled by the [IDB] Mission on the basis of a regional sample and data from the Ministry of Economic Planning and Coordination."

TABLE 5

GROSS DOMESTIC PRODUCT BY DEPARTMENT, 1973,
UNDER TWO ALTERNATIVE POPULATION ASSUMPTIONS

	GDP (millions of current pesos)	Assumption A			Assumption B		
		Ministry of Planning Population Projection (thousands)	GDP per capita (pesos)	GDP per capita ^a (dollars)	Population Extrapolation from 1976 Census ^b (thousands)	GDP per capita (pesos)	GDP per capita (dollars)
<u>TOTAL--BOLIVIA</u>	<u>21,459</u>	<u>5,331</u>	<u>4,025</u>	<u>201</u>	<u>4,419</u>	<u>4,856</u>	<u>243</u>
La Paz	6,910	1,675	4,125	206	1,413	4,890	244
Potosí	2,597	944	2,751	138	645	4,026	201
Cochabamba	3,605	866	4,163	208	697	5,172	259
Santa Cruz	3,648	505	7,224	361	645	5,656	283
Chuquisaca	1,438	500	2,876	144	348	4,132	207
Oruro	1,760	371	4,744	237	298	5,906	295
Tarija	837	224	3,737	187	181	4,624	231
Bení	515	212	2,429	121	158	3,259	163
Pando	129	35	3,686	184	32	4,031	202

Sources: Ministerio de Planeamiento y Coordinación; and Instituto Nacional de Estadística, unpublished data.

^a

Based on an exchange rate of \$b. 20 = US\$ 1.

^b

Based on national and departmental growth rates between 1950 (adjusted census data) and 1976 (unadjusted census data). (Departmental figures in 1973 do not add to the national total.)

population projections (Assumption A) GDP in all of Bolivia averaged US\$ 201 in 1973, with Santa Cruz having a figure 50 percent higher than that of any other Department. In Table 4, Santa Cruz is split into the high-income Tropical North and the low-income Tropical South, and the weighted average rural income for the Department is close to the national mean. This is not necessarily inconsistent with the high Departmental figure in Table 5, given the presence of a large and prosperous urban center. The income figure for Cochabamba in Table 5 is lower than one might expect given that the two Departmental regions in Table 4 (Northern Valleys and Subtropical South) are in the high-income category. The data for Oruro (Central Altiplano) also appear to be inconsistent with Table 4, but the concentration of the mining industry in this Department helps account for the relatively high average income there.

If the 1976 census results are extrapolated back to 1973 (Assumption B), GDP per capita rises to US\$ 243 at the national level. It also rises in all Departments but Santa Cruz, with the increases ranging from 10 percent in Pando to 46 percent in Potosí. In Santa Cruz, income per capita falls by 22 percent if the extrapolated census results are substituted for the pre-census estimates. The net effect of the census results--assuming that they are reasonably reliable--is to reduce estimated per capita income differences among Departments from 3:1 to less than 2:1.

There is a clear tendency in Table 5 for the downward adjustments in population to be greater in percentage terms the lower is the estimated per capita income in 1973. This suggests that the population is tending to migrate from low-income to high-income Departments.

Another indication of regional income differentials in rural areas is provided by 1970 data on agricultural sector output per rural inhabitant

for the three broad geographic regions (USAID/Bolivia 1974: 36):

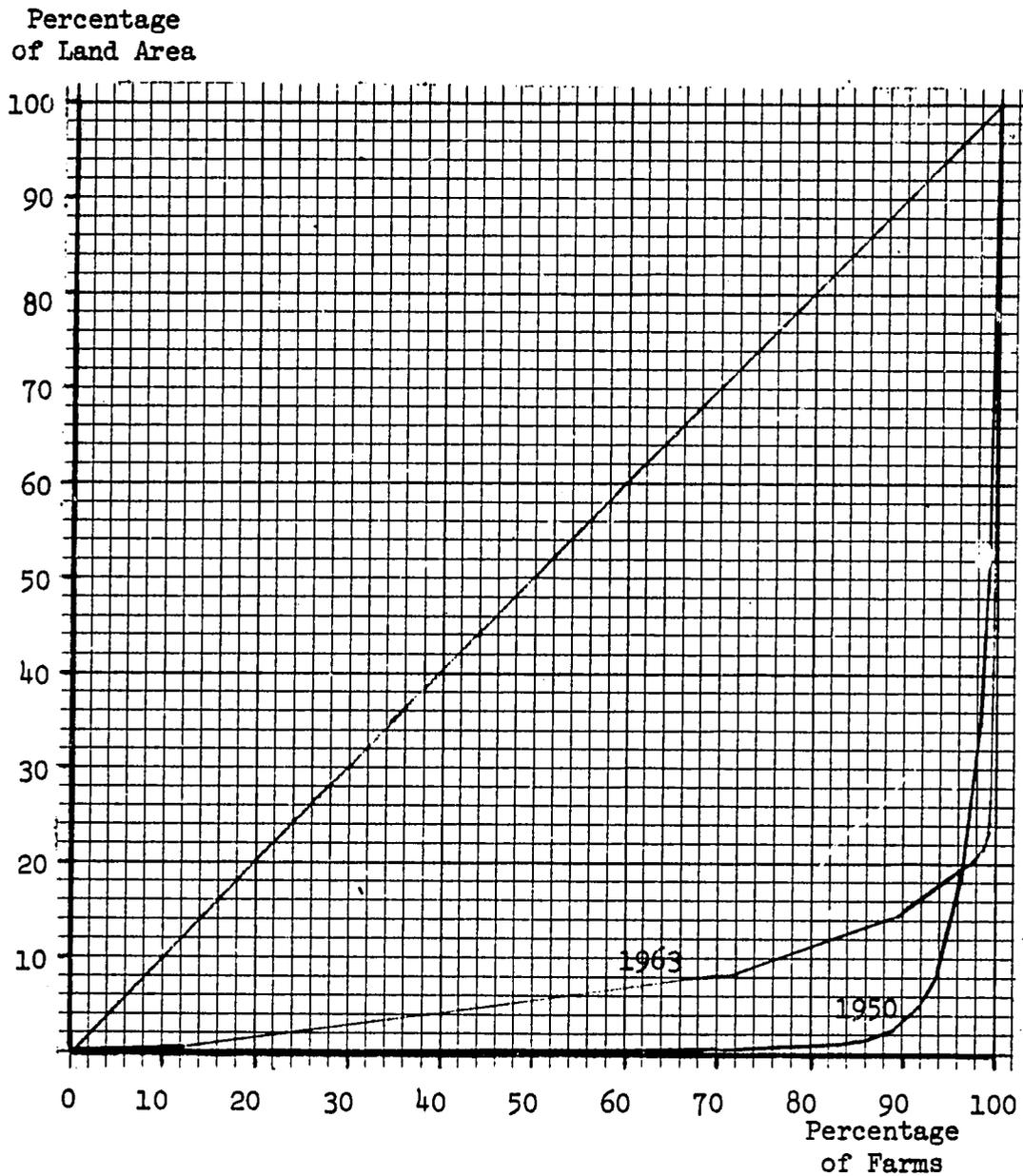
	Percent of Total Output	Percent of Rural Population	Relative Productivity
Altiplano	34	53	100
Valles	39	33	184
Oriente	27	15	281

These data, of course, do not show productivity per worker, nor do they indicate what share of agricultural income goes to labor. Moreover, they exaggerate regional differences because they are based on pre-census population estimates. Even so, adjusting the data to take these problems into account would still result in substantial rural income differentials.

Of even more interest in the USAID study are the figures cited for agricultural production trends in the three regions. Between 1965 and 1970, agricultural output on the Altiplano was estimated to have declined by 5 percent annually, while the Valles and Oriente experienced annual gains of 3 and 7 percent, respectively (USAID 1974: 36). Such trends would have tended to widen income inequalities among the three regions, and they help explain the population migration patterns revealed by the 1976 census.

Before turning to qualitative evaluations of income distribution, it is useful to consider one additional set of quantitative data: changes in the distribution of landholdings. Figure 1 shows that landholdings were very unequally distributed prior to the agrarian reform; the Gini coefficient in 1950 was an exceptionally high .95. A post-reform agricultural survey in 1963 (not officially accepted) indicated greater equality in the

FIGURE 1
DISTRIBUTION OF AGRICULTURAL LAND, 1950 AND 1963



Sources: Bolivia, DGEC (1956); Muñoz (1965).

distribution of land, with the Gini coefficient having fallen to .87. ^{10/} If we assume that greater equality of wealth distribution is translated into greater equality of income distribution, then these data would seem to support our tentative hypothesis that income became more equally distributed shortly after the agrarian reform.

However, one cannot necessarily assume a close relationship between changes in wealth distribution and changes in income distribution. Moreover, both the 1950 and 1963 data are not very reliable. The Agricultural Census of 1950 was plagued by enumeration errors and non-coverage of some remote areas. Colonos bound to haciendas apparently were not interviewed, and own-use production on their plots may have been underestimated or sometimes not counted at all. Numerous difficulties were encountered in constructing the sample frame for the 1963 survey (Muñoz 1965). Since the data are not comparable, ^{11/} they may not accurately reflect changes in land distribution between 1950 and 1963. There is little doubt that there was a movement toward greater equality in the Altiplano and Valles, but this may have been offset by the establishment of large new farms and ranches in the Oriente. Changes since 1963 are also difficult to determine. Finally, the

^{10/}

Land concentration, like income concentration, appears to be greater in Bolivia than in Ecuador, where the Gini coefficient was .86 in 1954 and .82 in 1968 (Américo Sánchez Cárdenas, "La reforma agraria en Ecuador: Una prioridad desatendida," Comercio Exterior [México] 20 [May 1970]: 402). The comparison is interesting since Ecuador has a population, income level, and agricultural resource diversity similar to Bolivia's, yet has experienced a less thoroughgoing agrarian reform.

^{11/}

In the 1950 census, colono families with usufruct plots on hacienda lands were not considered as separate production units. Land under cultivation was reported to have been 654,000 hectares in 1950 and 1,094,000 hectares in 1963; the implied increase seems too great, even considering the colonization of new lands since the mid-1950s. Even more striking are the figures for total agricultural property: 32,750,000 hectares in 1950 but only 7,842,000 hectares in 1963. The 1963 survey shows much less land in pastures, forests, and fallow than does the 1950 census. Recent evidence suggests that far more than 1 million hectares are now being cultivated, and both the 1950 and 1963 estimates may be too low.

figures exaggerate true wealth inequality since they are based on total landholdings and not cultivable land, which tends to vary inversely with size.

QUALITATIVE IMPRESSIONS OF INCOME DISTRIBUTION AT THE NATIONAL LEVEL

The quantitative data on income distribution discussed above are so poor that it was not possible to make a reliable judgment about changes in income distribution over time. This leaves unanswered a very important question: What impact did the agrarian reform of 1952-53 have on income distribution? We have speculated that income distribution became more equal until the late 1950s or early 1960s, after which there was a tendency toward greater inequality. But this was only a hypothesis, based on only one possible interpretation of poor data.

An examination of qualitative judgments is thus useful for shedding some light on the issue of changes in income distribution since 1952. First of all, we can consider evaluations of income distribution at the national level. These evaluations are often little more than impressionistic, since most researchers have concentrated their efforts on only one geographic region or on a handful of communities in each of several regions. ^{12/} Nevertheless, these views are worth considering, especially when it is clear that the authors have made a detailed review of the literature on the various regions of the country.

Ronald Clark (1970a; 1971), who as a researcher for the University of

^{12/}

Since there are considerable differences in the experiences of communities within a particular region (see the sections on Santa Cruz and Cochabamba below), generalizing on the basis of a small sample is quite dangerous.

Wisconsin's Land Tenure Center spent a number of years in Bolivia beginning in the mid-1960s, argues that the agrarian reform had a generally favorable impact on income distribution. This view is supported by convincing evidence from 51 ex-haciendas in the Northern Altiplano, particularly as regards changes in consumption and marketing patterns (R. Clark 1968). But as Clark himself admits (1971: 154):

There are still many areas, isolated for want of better roads, communications, and transport links, where the effects of the land reform have not been so dramatic. In these areas peasants provide for their own subsistence needs and sell very little for cash since they lack markets for their produce; they continue to wear mostly homespun clothing, and purchase few consumer durable goods. However, they no longer work for a landlord, but work on their own account as individual owner-operators. 13/

In another article, Clark also emphasizes the role of marketing, arguing that regional differences in post-1952 rural changes can be attributed mainly to the market for agricultural products, transport routes, and other means of communication (1970b: 6).

While almost all observers agree that elimination of the pre-1952 land tenure system (the colonato) generally resulted in an improvement in campesino welfare, even when consumption and income did not rise, vestiges of feudalism continued to characterize a few remote communities, particularly in Potosí, Chuquisaca, and Tarija (Barnes de Marschall 1974: 100). In other cases, former landlords continue to act as cultural brokers or power brokers, thus limiting the campesinos' economic independence and their

13/

This caveat really applies only to other parts of the highlands. But in an article on the cattle-producing regions of the Oriente, Clark (1974) argues that wealth (and presumably income) seems to be getting more unequally distributed in those regions.

social and political gains (Heath 1973). Even in communities where former landowners no longer live in the area, leaders of campesino unions (sindicatos) have sometimes required labor services of agrarian reform beneficiaries, though not to the same extent as under the colonato (Dorsey 1975b; Heath 1970; Simmons 1974). In summary, while the elimination of the colonato in itself often resulted in significant gains in welfare in the form of increased leisure and opportunities for remunerated off-farm work, ^{14/} this did not occur in all parts of the country.

Another general evaluation of the effects of agrarian reform is that of Daniel Heyduk (1974), who has reviewed the literature on the Altiplano, Yungas, and Valles. While Heyduk is concerned primarily with national integration of the peasantry, his conclusions have implications for welfare and income distribution. Heyduk's thesis is that the hacienda system operated with different degrees of rigidity in the various regions of the country, and that social and economic change after 1952 was greater where the system previously had permitted peasants to enter into decision-making processes. This flexibility was strongest in Cochabamba and in the Yungas:

In combination with this was a strong pattern of participation by peasants in marketing and trade, and through local syndicates (Cochabamba) or community office structures (yungas), in hacienda administration itself. In these areas, then, the agrarian reform program found a rather beneficial foundation already established under the old social order (Heyduk 1974: 9).

^{14/}

Largely because of opportunities for off-farm employment, incomes and living standards were higher for Bolivian campesinos on ex-haciendas near Lake Titicaca than for Peruvian campesinos working on similar (but non-reform) haciendas on the other side of the border (Burke 1967; 1970; 1971).

Thus after 1952 campesino unions replaced existing organizations in the Yungas and built upon their base in Cochabamba, acting as effective power brokers and cultural brokers and often playing a major role in marketing (though few were transformed into true cooperatives). Commercial agriculture, already established in these areas, was strengthened, and consumption levels began to increase. Social fluidity, already significant in Cochabamba, increased in both areas after 1952. ^{15/}

In the Altiplano, as in the Yungas, pre-1952 peasant organizations existed on which the sindicatos could build. Although there was some marketing of hacienda products, the system was basically oriented to subsistence, and in some cases haciendas seemed to be little more than agglomerations of self-contained peasant communities (Burke 1967; 1970; 1971). At the same time, roughly one-third of the land on the Altiplano was controlled by free communities, in which living standards differed little from communities belonging to the hacienda system (Carter 1963; 1965). Heyduk concludes that social change and marketings have increased slowly in the Altiplano, and that the increase in the campesinos' leisure time has been of little benefit. Burke (1967; 1970; 1971), however, found that leisure time enabled many families to supplement their income with

^{15/}

Léons (1966) and McEwen (1967; 1973) found significant improvements in the political and economic positions of campesinos in the Yungas communities they studied. Heyduk notes Léons' finding that conspicuous consumption of manufactured goods was an important cultural change in the Yungas. Evelyn Clark's (1970) study of Parotani, in the Lower Cochabamba Valley, found that accumulation of wealth and personal achievement, frowned upon before 1952, had become valued as a route for upward social mobility.

off-farm employment. ^{16/}

Finally, Heyduk reviews several studies of the Sucre and Tarija valley areas, where agrarian reform has had relatively little impact on the social structure or the subsistence orientation of farmers (Heyduk 1971 and 1973; Erasmus 1967 and in Heath, Erasmus, and Buechler 1969: 61-165). Even though many hacienda owners abandoned their lands after 1952, traditional relationships have continued among ex-colonos, their sub-tenants, and landless workers. Campesino unions have been weak. The lack of change is attributed in large part to geographic isolation (see also R. Clark 1970b).

In summary, Heyduk's review of the literature suggests that campesino incomes have clearly risen in the Yungas and in the Cochabamba Valley, have increased to a lesser degree in the Altiplano, and have changed little if at all in the Sucre and Tarija Valleys. While this provides some hints on absolute changes in income, the magnitude of the changes involved is uncertain (even in the primary sources reviewed), ^{17/} and this makes it difficult to draw any conclusion about changes in the relative income share of agrarian reform beneficiaries as a group at the national level. The question to be answered is this: Has income in the campesino sector grown as rapidly, faster, or slower than national income per capita, which in real terms seems to have increased by about 48 percent between 1950 and 1975? ^{18/} Before

^{16/}

Due to a problem with the questionnaire, Burke obtained off-farm income data from only 1 of the 4 ex-haciendas studied. Here he found that about half the campesinos had some outside employment in 1964-65, and he estimated that average money income earned by campesinos was US\$ 50-75 annually.

^{17/}

Ronald Clark's study of Northern Altiplano communities (1968) is one of the few exceptions.

^{18/}

This is the figure for GDP per capita, since data on national income are incomplete.

tackling this question again, it is useful to review additional qualitative evidence of the effects of agrarian reform on rural incomes.

Dwight Heath, who has conducted numerous studies of agrarian reform in Bolivia for the last two decades, provides what might appear to be contradictory views of the effects of the agrarian reform. In his dissertation (1959a), for example, and in an article published the same year (1959b), Heath argued that feudalism was abolished, but that the agrarian reform had achieved few of its other objectives and had not promoted economic development. In 1965, however, he pointed to improved housing, increased consumption of manufactured goods, higher social status, and higher self-esteem as reasons for the campesinos' support of the MNR. And in two studies published in 1969, he argued that there had been a significant redistribution of wealth in the Yungas (Heath 1969) and that at the national level "most campesinos are relatively much more affluent now than a decade ago" (Heath, Erasmus, and Buechler 1969: 386). 19/

One way to explain these differing views is to argue that some (or all) of them are generalizations based on experiences in only one or a few geographic regions. But while Heath's field studies have concentrated on the Yungas and the Oriente, he is well enough aware of events elsewhere in the country to avoid falling into this trap. Another explanation is that changes in income levels came slowly at first but had accelerated by the time Heath was doing his field work in 1963-65. If so, this would tend to

19/

In clarifying the use of the word "relatively" in this sentence, Professor Heath has explained (in a letter to the author on 2 May 1977) that it refers to an increase in absolute levels of consumption (as illustrated in the reference cited); it was not meant to imply that campesinos were more affluent than others. He also concurs with my explanation, in the next paragraph, of how his various statements might be reconciled.

conflict with our tentative hypothesis that income became more equally distributed in the 1950s and possibly the early 1960s, after which there was a trend toward greater inequality. Still another explanation of the apparent contradiction in Heath's views is that agricultural production data in the 1950s were very misleading, ^{20/} and detailed field studies were still rather scarce. To conclude under these circumstances that agrarian reform had produced few economic results would have been quite understandable--and quite possibly accurate--since many agrarian reform beneficiaries had not yet received title to their lands. Finally, the possibility should be considered that the timing of income increases not only differed in the various geographic regions, but also occurred at different times within a given region. Available studies for a particular region, being somewhat limited in number and spread out over time, might not be representative of the region at a given point in time, or of changes in the region over time. Heath himself comments on the change in his evaluation of the agrarian reform (Heath, Erasmus, and Buechler 1969: 332), but does little to explain it except to suggest that improved transportation and other factors not directly associated with the agrarian reform account for much of the improvement in rural living standards.

Richard Patch, another long-time observer of events in Bolivia, reported in a series of articles and essays in the 1960s (1961a; 1961b; 1961c; 1962; 1966a; 1966b; 1967) that the economic benefits of the agrarian reform

^{20/}

R. Clark (1968) provides evidence which suggests that the alleged production decline in the mid-1950s was largely just a decline in marketings.

did not seem to be as significant as the social changes. Agricultural production appeared not to have increased in the areas affected by the agrarian reform, but on-farm consumption was higher and marketings had declined. Patch believed, however, that the foundations had at least been laid for future production and income increases. ^{21/} The director of a major colonization study in the early 1960s (Patch, Marus, and Monje Rada 1962), he was very optimistic about present status and future prospects of colonization in the eastern lowlands (Patch 1962).

Ulrich Reye, whose research was concentrated in Santa Cruz, where the agrarian reform had a relatively minor impact, reported in a short article in 1967 that "agricultural reform . . . drastically changed the structure of the income and property pyramid, improving the standard of living of the rural population." This conclusion, though, was not adequately supported.

Also not well documented were several studies (Osborne 1964; Suárez de Castro 1963; Vellard 1970) which took the contrary view that agrarian reform had had little if any effect on rural standards of living. Support for this viewpoint, however, was provided by William Carter, whose dissertation (1963) reviewed the effects of the agrarian reform in the northern highlands. In a later essay (1971), Carter maintained that "the impediments placed before the [agrarian reform] council by the MNR government testify to the essentially political nature of the agrarian reform movement. The MNR seemed more interested in altering the basis of political power than in

^{21/}

Patch criticized U.S. aid programs for neglecting the campesino (1961c). In his view, aid needed to be focused on specific communities, whose residents should be actively involved in planning and administration.

modernizing Bolivia's agriculture." Carter also noted that parcels received by campesinos were small, except in remote and thinly populated areas.

Records show that the average parcel received by campesinos has been 7-8 hectares, but more research is needed to determine the distribution around the mean. Qualitative evidence suggests there may have been considerable inequality in land distribution. Carter, for example, reports a high degree of inequality in campesino landholdings within specific areas of the Southern Valleys (1971) and the Northern Altiplano (1965). ^{22/} This phenomenon is also reported by Erasmus (Heath, Erasmus, and Buechler 1969) for the Southern Valleys; Heyduk (1974) for communities in the Altiplano; Huizer and Stavenhagen (1974) for traditional (free) Indian communities; Léons and Léons (1971) for the Yungas; Dorsey (1975b) for the Lower Cochabamba Valley; Simmons (1974) for the Upper Cochabamba Valley; and numerous observers for the colonization areas. A Bolivian government study (Bolivia, CONEPLAN et al., 1972) asserted that incomes in Chuquisaca and Tarija were very unequally distributed.

In summary, qualitative information on income distribution in Bolivia provides a very mixed picture of the results of the agrarian reform of 1952-53. Living standards among the campesinos seem definitely to have risen in some areas, though it is not clear if such increases at the community (or national) level have matched, exceeded, or fallen short of the growth of national income per capita. Furthermore, it is difficult to separate the effects of the agrarian reform on income from those of improved transporta-

^{22/}

Before the agrarian reform, the relationship between the largest and smallest parcels worked by peasants in the Northern Altiplano was 10:1. When Carter conducted his research (around 1960), this ratio had been reduced only to 5:1 (reported in Wiggins 1976: 27).

tion and other factors not directly related to agrarian reform. ^{23/} Still, it seems reasonable to conclude that changes in income distribution in most rural areas since 1952 have been relatively minor in comparison with the profound changes in the social and political structures.

Another aspect of rural income distribution to consider is the effect of internal migration on rural income inequality at the national level. If we assume that almost all internal migrants to Santa Cruz have been low-income farmers, ^{24/} then it would appear that migration has shifted some very poor farmers into higher income brackets. Studies by Herrman (1974), Hickman (1968), Wessel (1968; 1972), and Zeballos Hurtado (1975) all argue that real income and/or consumption levels have increased for campesinos

23/

The argument that improved transportation is a major reason for higher campesino incomes is found frequently in the literature. For example, Ferragut (1964: 30) writes:

One of the factors that has most facilitated higher campesino incomes is the opening of new roads. Before, campesinos were obligated to deliver all their production to the hacienda owner, who paid extremely low prices for the products received. With the opening and improvement of roads, a large number of buyers now comes to agricultural production zones, and competition among them means that the campesino receives more satisfactory prices (translation).

Without the agrarian reform, however, such transportation improvements and changes in marketing undoubtedly would have occurred less rapidly.

24/

This is simply a hypothesis based on a review of numerous studies of colonization areas. These studies, however, are likely to miss some individual high-income farmers (or urbanites) who may have moved to Santa Cruz because of the commercial farming opportunities there. Additional research is needed to determine the proportion of high-income farmers accounted for by native Cruceños, other Bolivians, and foreigners.

after they become established as farmers in Santa Cruz. ^{25/} This is to be expected given the significantly higher average (and presumably marginal) labor productivity in the Santa Cruz area, compared with the areas of emigration (especially the Departments of Potosí and Chuquisaca, as well as parts of Cochabamba).

The large magnitude of the internal migration indicated by the preliminary 1976 census results suggests that migration might have significantly lowered the Gini coefficient at the national level. ^{26/} However, campesinos' incomes have not always increased as a result of migration. More comparative studies of pre- and post-migration income are needed to provide a reliable indication of the effects of migration on rural income distribution.

^{25/}

Wessel states that total family income in the Oriente communities he studied was not much higher than in the communities from which the migrants came, as more-than-doubled farm income was offset by reduced off-farm income opportunities. This statement is based on a comparison of median income differentials, for which data were not provided. Wessel's own data for average incomes show the differentials to be greater than his narrative evaluation suggests. Moreover, he implies that welfare was higher in the Oriente because of the assurance of food throughout the year and the ownership of enough land to permit significant increases in income in the long run. A study of the Alto Beni colonization zone, in the Department of La Paz, found that settlers' incomes in 1965 were 50 percent greater than they had been on the Altiplano (Torrico Arze 1970).

^{26/}

This seems to suggest an even higher Gini coefficient in the 1950s than the .607 figure found by LeBaron, Brown, and Ortíz for 1976; but this is not necessarily so. The inequality-reducing effects of migration beginning in the mid-1950s could well have been offset by inequality-increasing effects resulting from sharply higher incomes accruing to medium- and large-scale farmers in the Santa Cruz area.

INCOME DISTRIBUTION IN THE COCHABAMBA VALLEY

Having examined rural income distribution at the national level, we may now take a closer look at studies of individual communities in a few selected regions. One of these is the Cochabamba Valley, site of the most intense pressures for agrarian reform in Bolivia. Ucareña, where the agrarian reform law of 1953 was signed, is located in this region.

As Heyduk (1974) has pointed out, agrarian reform in the Cochabamba Valley displaced landowners perhaps to a greater degree than in any other region in Bolivia. However, he argues,

it is doubtful that the land so freed for redistribution among the peasants was of greater scale than that redistributed elsewhere. In fact, given the high density of rural population and consequent high pressure on land and marginal value of labor, Cochabamba peasants may have benefited less in substance from the reform than peasants in other highland regions (Heyduk 1974: 6).

This conclusion, though, is based on a small sample of rather general studies, and case studies of individual communities (not reviewed by Heyduk) suggest a different picture. Three communities are of particular interest because of the availability of comparable data at two points in time: Caramarica and Parotani in the Lower Valley, and Toralapa in the Upper Valley.

Carlos Camacho Saa, who studied ex-haciendas Caramarica and Parotani (and the non-hacienda community, Itapaya) in 1967, concludes in sharp contrast to Heyduk that:

The study of the Lower Cochabamba Valley is in a certain respect atypical, in the sense that the success that the agrarian reform apparently has had in this region probably is unparalleled in Bolivia. Land prices, production per hectare, and the level of living of the average campesino are indices which tend to justify this assertion (Camacho Saa 1970: 1; translation).

Higher living standards were especially evident in housing, with the one-room choza having been replaced by houses averaging 4-5 rooms. Purchases of radios, bicycles, sewing machines, and other consumer goods increased much more rapidly after 1952 on the ex-haciendas than on neighboring piquerías (pre-1952 small freeholdings where incomes had been somewhat higher before 1952 than on the ex-haciendas). Higher money incomes were obtained by switching from traditional subsistence crops (especially potatoes and corn) to onions, carrots, and other cash crops whose profitability was much higher. Camacho Saa estimated that per capita income in 1967 in the areas studied was \$b. 1,589 (US\$ 132), exceeding not just the rural average but also the national average. ^{27/} But given the lack of comparable data for 1952, it is difficult to determine how fast income increased in the 15-year period and to compare this figure with the nationwide increase in per capita income.

Evelyn Clark, who conducted research in Parotani in 1968, found that 71 percent of 35 families surveyed had at least 1 bicycle in 1967 (compared to 18 percent in 1952); 63 percent had radios (6 percent); and 40 percent had sewing machines (11 percent) (E. Clark 1970: 241). ^{28/} Although the exact timing of this and other increased consumption is not known, Clark does report that new housing construction in Parotani began 3-4 years after the agrarian reform, simultaneously with increased spending on fertilizers, improved seeds, and "ceremonial consumption." Purchases of consumer durables

^{27/}

It was estimated that \$b. 5,000 was the "minimum acceptable income" for campesino families and that more than 75 percent of the families interviewed were above this level (Camacho Saa 1970: 195-196).

^{28/}

The percentages for 1952 actually were probably higher, since no information was obtained on 1952 consumption patterns for 20 percent of the households studied.

and semi-durables tended to come after 1960 (Dorsey 1975b: 75). This suggests that real incomes increased significantly within a rather short time period and continued to increase (or at least did not decrease) thereafter. (The changes are too great to be accounted for by increased debt alone.)

Parotani and Caramarca were subsequently studied by Joseph Dorsey, who had access to the questionnaires administered by Camacho Saa and who conducted follow-up interviews which provided comparative data for 1973. In reviewing the earlier study, Dorsey (1975b: 26) concluded that "the pattern of landholding which developed in the Lower Valley as a result of the land reform process considerably increased the access of campesinos to land and produced a major redistribution of income in favor of ex-colonos . . ." ^{29/} Quantifying the term "major redistribution," however, is a problem. Although it was estimated that the campesinos in Parotani and Caramarca received less than 10 percent of the haciendas' net cash income before 1952 (p. 13), an accurate picture of real income would have to include estimated consumption of non-market goods and services. One thing that does seem clear is that campesinos' standards of living were higher in the Lower Valley than elsewhere in rural Bolivia even before 1952: work obligations were less demanding, ^{30/} soils were good, irrigation water was available, and an inventory of consumer goods in 1952 (E. Clark 1970: 240-242) reveals more purchases than would have been found in most other rural areas.

^{29/}

Evelyn Clark's view is similar: "the socioeconomic changes that have taken place in Parotani are primarily attributable to the land reform" (1970: 4).

^{30/}

The norm in the Lower Valley was 4 days a week of farm labor for the land lord, compared with 5-6 days in many other areas. Colonos in Caramarca even received a small daily wage equivalent to US\$ 0.05 (Dorsey 1975b: 11-15).

Turning now to the 1973 survey results, Dorsey found (p. 63) that the gross value of farm production per hectare fell (in 1973 prices) in both Caramarca (by 21 percent) and Parotani (by 56 percent) between 1967 and 1973. These declines are explained by lower relative prices received by farmers, due to government price controls following the 1972 devaluation, and by flooding in Parotani. However, land under cultivation increased for all families interviewed in Caramarca, and because of the dominance of land as an explanatory variable in determining gross farm income, and a continued switch to higher-valued crops, gross farm income in Caramarca actually rose slightly (though much less than the increase in output), while a decline still occurred in Parotani. The patterns were similar for total family income, which was estimated to have risen by 7 percent in Caramarca and to have declined by 37 percent in Parotani.

It would seem, however, that 1973 was an unusual year, and that incomes rose in both communities after 1967 until problems were encountered in 1973. Evidence for this view includes a decline in the number of families receiving wage income, as "campesinos apparently perceived that the marginal return to labor on their own land exceeded the wage being paid by the hacienda" (Dorsey 1975b: 41). ^{31/} Dorsey also reports (pp. 42-45) that there was relatively little migration from the two communities. Finally, the average value of houses (in pesos) rose sharply in both communities (p. 72):

	1967	1973
Caramarca	3,000	26,000
Parotani	5,500	22,000

^{31/}

The decline in numbers of families dependent on wage income was particularly sharp in Caramarca, from 80 percent to 12 percent. In Parotani, more than 90 percent received wage income in 1967 but less than 50 percent in 1973.

In Dorsey's view, most of this increase was real and not due simply to inflation and to more realistic housing values.

South of Caramarca and Parotani is Capinota, a provincial capital studied by anthropologist William Kornfield (1969). While Kornfield provides little quantitative information on economic conditions around Capinota, he reports that changes since 1952 have included a shift to carrots, beets, and other high-value crops, and a much greater participation by area residents in market activity.

The Upper Cochabamba Valley is not as prosperous as the Lower Valley, and the extent of changes there seems to have varied a great deal. Camacho Saa's dissertation (1967), based on interviews of 142 families in the community of Ucureña, found little change in crop patterns, mainly because of the lack of irrigation. Most production was still for household consumption; only 32 percent of the major crops (corn, wheat, and potatoes) were marketed. Potatoes were widely grown, although a linear programming model suggested that they were much less profitable than corn or dairy cattle. Productivity was significantly different from that on nearby piquerías. Land was distributed fairly equally, though, as the median of 3.50 arobadas (1.26 hectares) was close to the mean of 3.73 (1.34 hectares). Productivity did not vary with size among area farms, all of which could be considered minifundios. ^{32/} The marginal productivity of labor, it was argued, was close to zero.

Greater changes were found by Marcelo Peinado Sotomayor (1971), who

^{32/}

Camacho Saa reported that almost all land in the Upper Valley was distributed to campesinos in holdings of less than 5 hectares. The only larger landholdings were lands retained by the ex-hacendados and public lands around the experiment stations.

interviewed a 25 percent random sample of the population in three other Upper Valley communities. Most of these ex-colones had received not only their pre-1952 plots, but additional land as well. Transportation improvements further increased marketing opportunities for potatoes, by far the most important crop.

One of the communities studied by Peinado Sotomayor was the ex-hacienda Palca, where anthropologist Roger Simmons was working at about the same time (1967-68). Simmons (1974: 71-78) reported that production on Palca fell sharply right after the agrarian reform, mainly, in the campesinos' view, because of the local sindicato's emphasis on political matters. By 1968, the campesinos felt that they had returned to (but probably did not surpass) pre-1952 production levels. Potatoes and grain continued to be the major crops, and technology was basically the same. Still, the removal of pre-1952 rent obligations and particularly onerous work requirements (six 12-hour days a week on the hacendado's land) meant that standards of living had improved considerably. Food consumption had increased, housing had been upgraded, and campesinos were going into the marketplace to purchase clothing, medical care, and consumer durables. Income per capita was found to be higher than the national average in 1967. There were considerable income differentials, with family cash incomes ranging from US\$ 100 to US\$ 2,500. Campesinos' attitudes toward change were still cautious: the old existed alongside the new, and social sanctions were applied to those who tried to deviate sharply from community norms regarding life styles.

Toralapa, another of the communities studied by Peinado Sotomayor, seems to have been the largest of some 160 ex-haciendas in the Province of Arani. It was revisited in 1973 by Joseph Dorsey (1975a), who conducted a follow-up

survey. Dorsey noted (pp. 16-18) that income before the agrarian reform was very unequally distributed, with close to 90 percent of production and 98.5 percent of income from farm product sales going to the hacendado, ^{33/} and the remainder split among 20-30 colono families. As on Palca (Simmons 1974: 16) colonos were using only about half the land available to them, as the labor services demanded by the hacendado left them insufficient time to fully use their plots. Real income was lower than that of the piquerías in the same area, and seems to have been lower, too, than in Caramarca or Parotani in the Lower Valley. Houses had only one room, there was no school clothing was homespun, and medical care was provided by traditional practitioners.

By 1967 significant changes had occurred in Toralapa. As a result of the agrarian reform, campesino families generally received 2-4 hectares of land in addition to their pre-1952 plots, and a Lorenz curve constructed by Peinado Sotomayor shows the Gini coefficient for land to be something like .33 (estimated by eye from the diagram in Dorsey 1975a: 33). In the nearby piquería Palca, by contrast, the Gini coefficient was about twice as high. Production on Toralapa doubled between 1950-51 and 1965-66, as did marketings, with 71 percent of the output marketed in 1965-66.

Per capita income in Toralapa was approximately US\$ 200 in 1967, higher than the national average of US\$ 127 and an estimated 25-40 percent above that of farms in the Lower Valley. Dorsey cautions, however, that the average of US\$ 200 is misleading because one of the farms studied (out of only

^{33/}

No data were available for cash sale of crops and livestock products by colonos to middlemen; but these receipts were probably too small to significantly alter the picture of extreme income inequality.

20 surveyed in 1967 and 18 in 1973) had significantly more land than the others and an income more than 5 times that of the remaining farms. This means that average income on the remaining farms was about US\$ 165. Dorsey argues that this is still above average for the Upper Valley, since elsewhere campesinos received less land, poorer quality land, or land that was farther from markets (p. 5). ^{34/} Nevertheless, he concludes that campesinos in Toralapa have lower living standards than those in the Lower Valley (pp. 5-6).

Dorsey found that per capita income in Toralapa fell slightly between 1967 and 1973, and that the percentage of cash expenditures devoted to food rose from 42 to 52 percent (pp. 5, 67). Potato output was down by 41 percent, perhaps because of climatic conditions and farmer response to lower prices. Regression analysis suggested that increases in farm income were constrained much more by the availability of labor than by that of land.

One interesting finding of Dorsey's studies in both the Upper and Lower Valleys was that campesinos seemed to have accumulated substantial cash savings, which in Toralapa were used mainly for housing and livestock purchases while in the Lower Valley land purchases as well as housing were important. These findings support what might be called the "new conventional wisdom" that income redistribution does not have a negative effect on domestic savings. Indeed, the rural savings rate in the Cochabamba Valley may well have

^{34/}

In one community studied by Peinado Sotomayor, per capita income in 1967 was estimated to be only US\$ 30 (Dorsey 1975a: 5). In the peach-growing areas of the Upper Valley, the average landholding is reported to be only 0.9 hectare (Rodríguez Iriarte 1975).

increased. High rural savings have also been reported in a recent FAO-IDB survey, which estimated rural savings in Bolivia generally to be between 15 and 30 percent (IDB 1973: 8).

The case studies reviewed in this section suggest that a significant redistribution of income occurred in the Cochabamba Valley between 1952 and 1967. Campesinos' incomes probably rose fairly steadily throughout this period. In the last 10 years, however, their real incomes may well have grown slowly or stagnated, and in some cases declined. What happened to rural income distribution would depend on changes in the incomes of the larger farmers engaged in dairy farming, fruit production, and other activities, about which we know very little.

The impression of stagnation in rural incomes is reinforced by statements to this effect in two recent reports: (1) a review of the agricultural sector in Cochabamba by the Corporación de Desarrollo de Cochabamba (CORDECO 1975: 166-167), and (2) a regional seminar on Departmental development problems (CODEX 1976: 66). Though both of these may be viewed in part as special-interest pleading to the national government for more budgetary assistance, and they report increases for some categories of agricultural output (e.g., dairy and poultry production), their views are backed by official statistics which show a decline in per capita Departmental agricultural product between 1965 and 1973. This contrasts sharply with an annual growth in per capita Departmental Product of about 3 percent (CODEX 1976: 66).

In 1974 the situation seems to have worsened. Large price increases were authorized for rice, sugar, and other products produced in the lowlands but prices of products produced in the Cochabamba Valley were not raised. This led to vigorous protests which were quelled by force (Whitehead 1976: 64).

In concluding this section, we may review one other case study from the Department of Cochabamba, though it is away from the valley area in the lower-altitude, southeasternmost Province of Campero. This is a sociological-anthropological study of Cantón Omereque, where geographic isolation and poor transport are offset by fertile soils, irrigation waters from the Río Mizque, and a favorable rainfall pattern permitting year-round cultivation (Guillet 1973). Rapid economic progress is reported for the years since 1952, based on commercial cultivation of sugarcane, cumin, tomatoes, and anis. Campeños in the area were found to be risk-takers, and economic success was rewarded with higher social status.

INCOME DISTRIBUTION IN SANTA CRUZ

The Ministry of Agriculture-Utah State University study in 1972 found income distribution in the Santa Cruz colonization area to be among the most equal of the 10 geographic regions studied (see Table 2). ^{35/} This is an interesting finding in that there was very little redistribution of land in this region following the enactment of the agrarian reform law of 1953. Pressures for land redistribution were not particularly great, given the less on-

^{35/}

In the less populated parts of the Department of Santa Cruz, however, there was greater inequality in the distribution of income.

erous land tenure structure characterizing what was then--and still is--a labor-shortage region.

The completion of the Santa Cruz-Cochabamba highway in 1954, and pressures after 1952 to provide land to the landless, prompted the government to undertake a series of directed colonization projects near the city of Santa Cruz. These projects were generally poorly planned and administered, had unfavorable benefit-cost ratios, and suffered high abandonment rates. Such shortcomings, however, were not peculiar to Bolivia, as directed colonization programs in other Latin American countries have tended to suffer the same fate (Nelson 1973).

These discouraging experiences notwithstanding, some of the government-directed colonies are viable today--either for subsistence or commercial agriculture--as spontaneous colonization, stimulated by population pressures in the Altiplano and Valles and by new market opportunities near Santa Cruz, has filled the void left by the original colonists who abandoned the directed settlements. Spontaneous colonization has also occurred in other lowland areas, and the 1976 census suggests that the flow of people eastward has been much greater than previously had been estimated. ^{36/} There is a con-

^{36/}

The Instituto Nacional de Colonización had estimated that there were 86,236 people living in colonization zones in the Department of Santa Cruz as of January 1975, of which 65,328 were in spontaneously colonized areas (Bolivia, INC, 1976).

sensus among students of Bolivian colonization that the benefit-cost ratio for spontaneous colonization is much more favorable than that for government-directed projects. ^{37/}

A major study of the colonization areas in the early 1960s (Patch, Marus, and Monje Rada 1962) found that colonists had adapted to changes in diet, climate, and crop patterns with less difficulty than many had feared. Most colonists interviewed said that their diet was better than in the Altiplano or Valles. As noted in the previous section, even when colonists' incomes were not significantly above those in the highland communities they had left, the assurance of a year-round food supply and the good prospects for increasing income made settlement in the lowlands attractive.

Before examining several other studies on the level and distribution of income in the Santa Cruz colonization region, it is useful to summarize briefly the factors that account for its relatively high average agricultural income (see Table 4). First of all, of course, there is the quantity of land available to the individual colonist (usually at least 10-15 hectares and often 50). Although soils are subject to rapid exhaustion, colonists generally have enough land to practice what is commonly called shifting agriculture, clearing additional land on their plots (or frequently moving to a different geographic location) once yields have begun to decline. Secondly, the land is well suited to the production of major import substitution and export crops (especially rice, sugar, and cotton) for which mar-

^{37/}

See Zeballos Hurtado's dissertation (1975) and the other studies he cites on pp. 40-41.

keting opportunities have been generally good, though erratic. There have also been good opportunities for raising livestock. Thirdly, much more credit has been made available in Santa Cruz than in the rest of the country combined. ^{38/} Fourthly, technical assistance, though still quite inadequate, is available more than in other parts of the country. Finally, the technical and entrepreneurial skills of the colonists--Bolivians as well as foreigners--are above average for the country's farmers. These favorable conditions combined to produce an estimated agricultural growth rate for the Department of 7.5 percent annually between 1950 and 1968 (Gómez 1974), and growth since 1968 has continued to be rapid.

Micro-level studies of income distribution for Santa Cruz, as for the rest of Bolivia, are scarce. One such study was conducted by the Methodist Church in Bolivia (1972 [?]) for 10 diverse colonies north of the city of Santa Cruz (none of which were foreign colonies). Pre-tested questionnaires were administered to a 10 percent random sample (or a minimum of 25 respondents) in each of the 10 colonies. Of the 470 farmers surveyed, 76 percent had settled on their own initiative and only 24 percent under government-sponsored programs.

There are several major problems involved in interpreting the income distribution data in this study (which presumably are for 1971). Net in-

^{38/}

In the 30-month period from July 1973 to December 1975, the public-sector Banco Agrícola de Bolivia made 4,455 loans totalling \$b. 1,039 million (US\$ 52 million), of which 75 percent went to Santa Cruz (Banco Agrícola de Bolivia 1976). Private bank credit for agriculture totalled \$b. 162 million (US\$ 8.1 million) in the first 9 months of 1974, with about 90 percent going to Santa Cruz (Federación Departamental de Empresarios Privados, Santa Cruz 1975: 110-111).

come per farm unit is defined in an unusual manner: "gross income minus all cash costs with the exception of labor. It is the return to all labor used on the farm, including hired labor." Unfortunately, it is not possible to determine hired labor costs from the information provided, though data on labor time are available for both family and hired labor. Net cash income per family, then, has to be estimated by making some assumption about the relative remuneration of farm and non-farm labor. Even then, of course, we are left with an incomplete picture of living standards, since non-monetary income (especially, but not only, agricultural production consumed on the farm) is not included. If this imputed income were added to cash income, the result would almost certainly be to narrow the reported differentials both between and within the colonies. ^{39/} Such a task, however, cannot be undertaken with the data provided.

The assumption we have made about the relative remuneration of paid and unpaid labor is a simple one: that cash remuneration per day is identical for both categories of workers. Since labor time data are available for both categories (see Table 6), net farm income after payment of hired labor can be easily--though not necessarily accurately--estimated by this procedure. A more accurate estimate of labor costs is made difficult by the fact that there are considerable variations in daily wages by task, by crop, and even by farm for the same task and crop. ^{40/} Insufficient information is provided

^{39/}

This statement is based on data provided on inter-colony differences in nutrition level, water supply, literacy, and distribution of fixed assets (value of consumer durables and capital goods, excluding housing). For housing, however, there appear to be substantial differences in average housing quality among the 10 colonies.

^{40/}

Sugar harvesters, for example, received cash wages in the early 1970s which were 1.5-2.0 times those of cotton workers (Wennergren and Whitaker 1975: 130).

TABLE 6
 AVERAGE FARM INCOME IN 10 COLONIES NORTH OF SANTA CRUZ, 1971(?)
 (pesos)

Colony	Net Farm Income		Labor Use (Man-Years)			Average Net Income ^a		Per Capita Income ^c	
	Reported ^a	Adjusted ^b	Family	Hired	Total	Per Family Worker-Year	Per Total Worker-Years	Reported ^a	Adjusted ^b
Cuatro Ojitos	12,625	6,203	1.41	1.46	2.87	8,954	4,399	2,140	1,051
Aroma	13,484	5,536	1.20	1.94	3.14	11,237	4,613	2,408	989
San Juan de Amarillos	6,017	3,576	1.23	.84	2.07	4,892	2,907	1,280	761
Hardeman	1,949	1,620	1.18	.24	1.42	1,652	1,373	291	242
San Pedro	5,476	3,337	1.31	.84	2.15	4,180	2,547	1,053	642
Calama	4,709	3,395	1.24	.48	1.72	3,798	2,738	841	606
Sagrado Corazón	9,433	4,716	1.44	1.44	2.88	6,551	3,275	1,747	873
Buen Retiro	3,545	1,588	1.18	1.38	2.56	3,084	1,346	806	361
Yapacaní	3,632	2,223	1.34	.91	2.25	2,710	1,659	790	483
Huaytú	5,058	2,909	1.26	.93	2.19	4,014	2,309	992	571
AVERAGE-- 10 COLONIES	6,304	3,478	1.28	1.05	2.33	5,099	2,717	1,318	727

45

Source: Methodist Church in Bolivia (1972: 75-76) and author's adjustments.

a
 Gross cash income minus all cash costs except labor.

b
 Net income to farm family after hired labor is paid. Assumes an equal average daily cash remuneration of hired and non-hired labor (and that all returns to family members are returns to labor).

c
 Net farm income divided by average number of family members.

on the types of labor hired to estimate labor costs with the aid of scattered data on standardized wage rates. Our adjustments, then, are illustrative, though probably more meaningful than the unadjusted data in Table 6.

Assuming a working year of 240 days, the estimated daily wages derived from our adjustment procedure range from \$b. 5.60 to \$b. 19.20. ^{41/} Both of these figures are probably too low, though if the working year is assumed to have fewer days the figures would probably be more accurate. ^{42/}

The unadjusted (but misleading) per capita income figures in Table 6 show an average net cash income in the 10 colonies of \$b. 1,381 (or US\$ 115 at the then-prevailing exchange rate of \$b. 12 = US\$ 1). Excluding the one colony (Hardeman) with an abnormally low income, the per capita income differential among the colonies is approximately 3:1. Using the more appropriate income measure, average net cash income per capita falls to \$b. 727 (US\$ 61), and the differential narrows to 2:1. Inclusion of non-market activity would raise the per capita income figures substantially, but they would still probably be below those prevailing in the more prosperous communities in the Cochabamba Valley. ^{43/} On the other hand, they are probably

^{41/}

The highest daily wages were in two colonies which grew sugar cane as their major cash crop. This is consistent with what is known about wages of sugar harvesters relative to those of other workers (see the previous footnote).

^{42/}

A working year was not defined in the original study.

^{43/}

Cf. the case studies in the previous section. See also Table 4, which shows that average cash income in the Northern (Cochabamba) Valleys is higher than in any other rural area in Bolivia.

above those in the poor communities in the Altiplano and Valles. ^{44/}

In addition to providing data on average income for each colony, the Methodist Church's study also provided data on income distribution within each colony and for the 10 colonies combined. The unadjusted data yield the Lorenz curves shown in Figure 2. For the 10 colonies combined, the Gini coefficient was a relatively high .61, though for most individual colonies it is lower. Adjustment of these data to subtract hired labor costs from "net farm income" is not advisable in this case: since income differentials are greater within the colonies than among them, the errors inherent in our estimating procedure would be magnified. But given the reported differentials in the use of hired labor among various income groups, it appears that a more realistic definition of net farm (cash) income would result in a lower degree of income concentration.

Other statistics on income distribution in Santa Cruz are provided by Hernán Zeballos Hurtado (1975: 93-94) for spontaneous colonists in the Chane-Piray zone northwest of Montero and for colonists in directed projects in the Yapacaní zone on the border with the Department of Cochabamba. Average net farm income ^{45/} for 99 families in Chane-Piray was \$b. 12,322 (US\$ 616) in 1973, significantly higher than the \$b. 8,114 figure for the Chapare (Cochabamba) and the \$b. 3,313 figure for Caranavi (La Paz). The Gini coef-

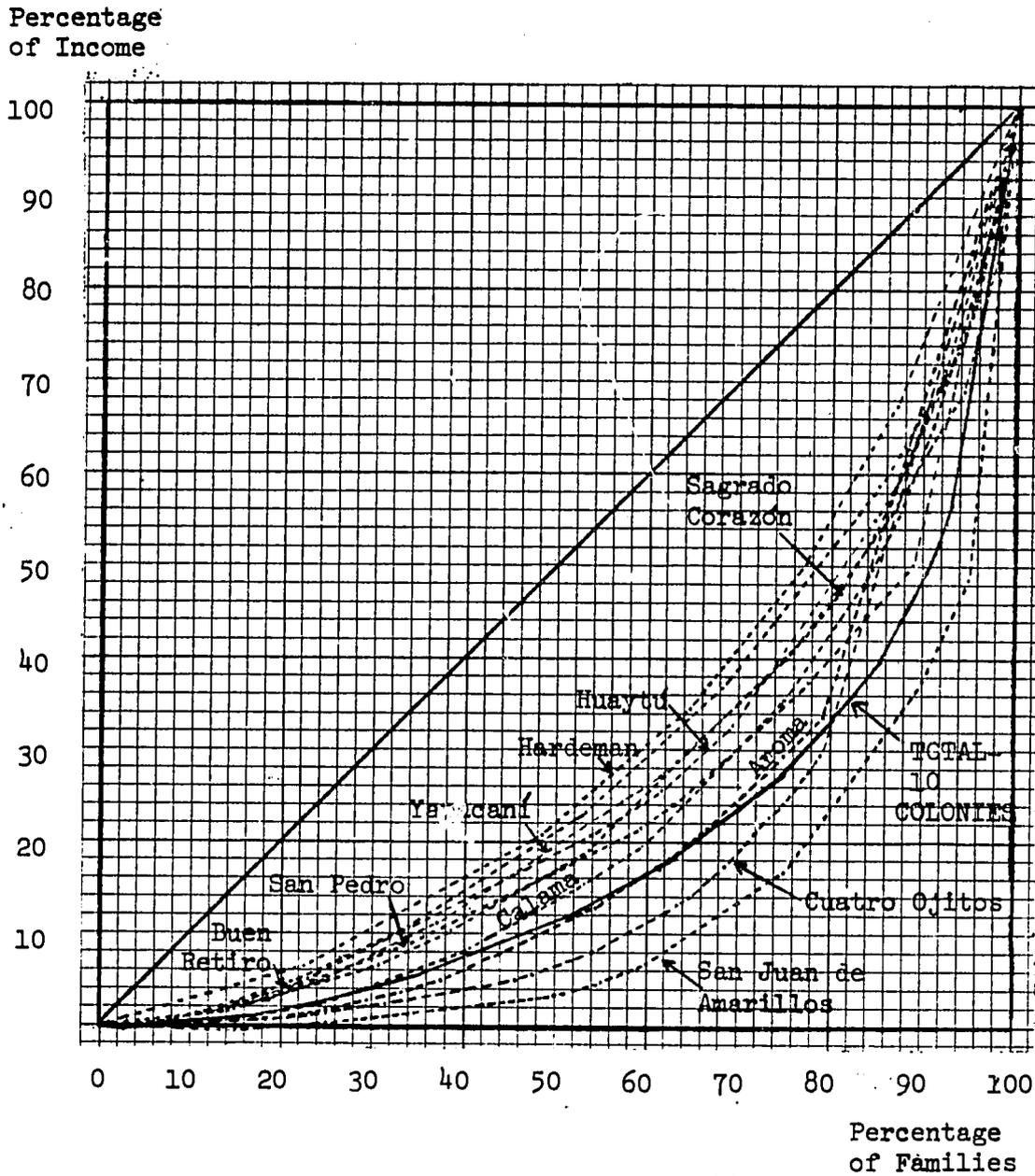
^{44/}

USAID/Bolivia (1974: 283) estimated that rural income per capita for all of Bolivia was about US\$ 45-50 in 1974. The results of the 1976 census, however, would imply an upward adjustment to US\$ 60-65. If non-monetary income were accurately measured, the figure would be higher still.

^{45/}

Zeballos Hurtado (1975: 87) defines net farm income as "total sales plus total home consumption, minus operating costs including depreciation. Consumption of farm products was valued using equivalent prices to those received by sales (opportunity cost)."

FIGURE 2
 DISTRIBUTION OF INCOME^a IN 10 COLONIES, 1971(?)



Source: Methodist Church in Bolivia (1972[?]).

^aFor a discussion of problems with the definition of income, used, see the text.

ficient for Chane-Piray, derived from Zeballos Hurtado's data, was .47. For 102 families in directed projects in Yapacaní, net farm income averaged only \$b. 3,559 (US\$ 178), less than in Chimoré (Cochabamba), with \$b. 4,881, and Alto Beni I (La Paz), with \$b. 6,762, but more than in Alto Beni II (La Paz) with \$b. 2,583. The Gini coefficient for the Yapacaní zone was .65.

The average per capita incomes in 1973 implied by the above data were US\$ 128 in Chane-Piray and US\$ 37 in Yapacaní (based on a total sample average of 4.8 members per family; this compares with a national average of 5.0 in MACA's 1972 rural survey). The Chane-Piray figure is above average for rural Bolivia, while that for Yapacaní is below average. These figures, however, are incomplete, because they do not include cash income from non-farm activities. How the inclusion of this income would affect income levels and income distribution in the colonization areas is not known.

If incomes are as low as they appear to be in colonies such as those studied by the Methodist Church and in directed colonies like those studied by Zeballos Hurtado--and presumably lower still among many small-farmer settlers not part of identifiable communities--the relatively high average income level in the region as a whole means that other groups there must have substantially higher incomes. Commercial farmers and ranchers with hundreds (or thousands) of hectares clearly fall into this category, but foreign settlers with less land--particularly in the Mennonite, Japanese, and Okinawan colonies--also seem to have above-average incomes. ^{46/}

^{46/}

As of January 1975, according to estimates made by the Instituto Nacional de Colonización (INC 1976), there were 339 Mennonite families with 2,951 family members and 1,085 Okinawan and Japanese families with 6,165 family members. Ferragut (1961: 29) reports that gross value of production for the Mennonite colonists averaged US\$ 1,739 in 1960, compared with US\$ 1,025-1,195 for Japanese and Okinawan colonists and only US\$ 298-563 for Bolivians in 4 directed colonization projects (Aroma, Cuatro Ojitos, Huaytú, and Cotoca--the first 3 of which are included in the Methodist Church's study).

Detailed data on the recent economic performance of the Mennonite colonists were not found, ^{47/} but statistics for the Okinawan colonies and the Japanese colony (San Juan) were obtained from the Servicio de Cooperación Internacional del Japón en Bolivia (1976). ^{48/} These data show a sharp rise in average family income during the 1970s to \$b. 126,003 (US\$ 6,300) in San Juan and \$b. 177,377 (US\$ 8,869) in the 3 Okinawan colonies by 1974 (see Table 7). ^{49/} Given an average family size of approximately 5 persons (INC, [Actividades], 1976), per capita income was US\$ 1,260 in San Juan and US\$ 1,774 in the 3 Okinawan colonies. These figures are much higher than those in the colonies studied by the Methodist Church. However, farm income is very volatile, and the 1974 figures probably reflect an unusually favorable set of circumstances in that year. No information is available on the distribution of income within the Japanese and Okinawan colonies, but there seems to be a fairly high degree of equality in the distribution of land.

No other data were found on income distribution within the Santa Cruz colonization region, but some figures were available on the distribution of landholdings. For the 10 colonies studied by the Methodist Church (1972[?]: 7), original lot sizes were 15, 20, or 30 hectares, depending on the colony, indicating a high initial degree of equality. The distribution of land in

^{47/}

For background information on Mennonite colonization, which began in 1954, see Wessel and Wessel (1967).

^{48/}

For background information on Japanese and Okinawan colonization, see Tigner (1963) and Thompson (1970). Tigner reports (p. 217) that the net family income of Ryukuan farm families averaged US\$ 870 in 1951. This was well above the average for rural Bolivia at that time.

^{49/}

The data in the earlier years in this table are not as reliable as those for the last few years.

TABLE 7

AVERAGE FAMILY INCOME IN SAN JUAN COLONY
AND OKINAWA COLONIES NO. 1, NO. 2, AND NO. 3, 1970-75
(in current pesos)

SAN JUAN

	Gross Agricultural Income	Net Agricultural Income	Other Income	Total Family Income
1970	46,953	23,269	3,941	27,210
1971	54,608	26,494	4,878	31,372
1972	75,361	34,470	6,295	40,765
1973	130,484	57,284	11,596	68,880
1974	284,733	112,548	13,455	126,003

OKINAWA 1-2-3

	Gross Agricultural Income	Net Agricultural Income	Other Income	Total Family Income
1970	-786	-403	-87	-490
1971	-824	-413	-139	-552
1972	50,029	14,301	7,177	21,418
1973	145,400	50,821	11,070	61,891
1974	245,049	77,745	99,632	177,377

Source: Servicio de Cooperación Internacional del Japón en Bolivia (1976)

these colonies in the early 1970s is shown in Table 8. Of the 470 ^{50/} colonists interviewed, 26 percent had 1-15 hectares of land (in most cases, apparently, close to 15), 70 percent had 16-50, and only 4 percent had more than 50. ^{51/} The average was 26.7 hectares. The recent data show that the distribution of land has become less equal, but the inequalities still are not especially great. The same is true, generally, for the distribution of land within each of the 10 colonies.

Á survey of the agricultural sector in Santa Cruz, prepared for the Comité Departamental de Obras Públicas by the Asociación de Consultores Ltda. (1975), contains data on the distribution of landholdings devoted to sugarcane and to cotton. These data are presented in Table 9. The Gini coefficient for cotton may be roughly estimated by assuming that the average plot size is at the mid-point of each area range and is 4,000 hectares for the open-ended category. This procedure yields a figure of about .48. ^{52/} For sugarcane, the coefficient obtained directly from the data in Table 9 is .61. ^{53/}

^{50/}

This is the number indicated in the source, but the actual number for which data on lot size were obtained seems to be about 455.

^{51/}

Given the nature of the data and the arithmetic errors explained in the footnote to Table 8, Lorenz curves and Gini coefficients cannot be determined without making some arbitrary assumptions. Because of this--and benefit-cost considerations--such calculations were not made. Actual concentration of landownership was somewhat greater than the figures indicate, since several members of some families each owned separate plots.

^{52/}

This is the figure for the 1974/75 crop year. When compared with 1972/73 the data show a movement toward greater equality in the distribution of cotton land.

^{53/}

It is worth emphasizing the roughness of these figures, which are based on a straight-line joining of a small number of points. Freehand curves yielded coefficients of about .53 for cotton and .62 for sugarcane.

TABLE 8
 LAND DISTRIBUTION IN 10 COLONIES, 1971(?)
 (percentage distribution)^a

Colony	Number of Plots ^a	Hectares							
		1-15	16-20	21-25	26-30	31-40	41-50	51-60	60+
Cuatro Ojitos	77	3.8	57.7	3.8	13.4	8.6	5.7	—	6.7
Aroma	29	54.0	12.0	4.0	4.0	20.8	—	—	4.1
San Juan de Amarillos	21	—	90.0	5.0	—	—	—	5.0	—
Hardeman	31	93.6	—	—	6.4	—	—	—	—
San Pedro	25	4.3	4.3	13.0	56.0	—	8.6	13.0	—
Calama	32	6.6	10.0	6.6	43.0	3.3	23.0	3.3	3.3
Sagrado Corazón	30	3.7	40.0	11.0	37.0	—	—	—	7.4
Buen Retiro	63	100.0	—	—	—	—	—	—	—
Yapacaní	141	1.0	4.4	3.0	25.1	3.0	20.0	0.5	0.5
Huaytú	21	7.6	11.0	7.6	30.0	27.0	7.6	3.7	3.7

Source: Methodist Church in Bolivia (1972[?]: 44-45).

a

On the basis of the figures given for the total number of landholdings in each community it was found that many of the percentage figures were computed incorrectly. In some cases it is clear that the number landholdings for which data on area are available is less than indicated; in other cases it is not clear if this is the error or if the calculations were simply incorrect. Data on the absolute number of plots in each size category are not available. In any event, the errors are relatively minor and do not significantly affect the overall picture.

TABLE 9
DISTRIBUTION OF COTTON AND SUGARCANE LANDS
(percentage)

A. Cotton (1974/75)

Size of Plots (Has.)	Percentage of Plots	Average Plot Size ^a	Percentage of Land Area
10 - 100	39	55	8.1
101 - 400	45	250	42.2
401 - 800	12	600	27.0
801 - 1,000	2	900	6.8
1,001 - 3,000	1.5	1,500	8.4
More than 3,000	0.5	4,000	7.5
TOTAL	100.0	275 ^b	100.0

B. Sugarcane

Size of Plots (Has.)	Number of Farmers	Percentage of Farmers	Percentage of Land Area
0 - 5	1,782	56	12
6 - 10	621	19	14
11 - 20	378	12	17
21 - 50	326	10	32.
51 - 100	79	2.5	18
More than 100	16	0.5	7
TOTAL	3,202	100.0	100

Source: Asociación de Consultores Ltda. (1975, Vol. IV: 25).

a

We are assuming that the average plot size is equal to the mid-point of each range and is 4,000 hectares for the open-ended category.

b

As reported in the original study. Our estimates result in a figure of 266.4 hectares.

The source of these data is not indicated. If obtained from the cotton and sugar producers' associations they are probably fairly reliable, though small producers may be underestimated. Such an underestimation is suggested by another set of data on land distribution in the sugar-producing areas north of Santa Cruz (Díez de Medina 1975: 34-42):

Category of Producer	Percentage of Producers	Percentage of Area
Large (more than 60 hectares)	2.56	22.70
Medium (20.1-60.0 hectares)	8.15	26.15
Small (up to 20.0 hectares)	89.26	51.13

These data show a higher percentage of small farmers, and a higher percentage of land controlled by those with 20 hectares or less, than the previous estimates.

Finally, some data are available for the distribution of land in cattle ranches in the Oriente (including the lowland regions outside the Department of Santa Cruz). Of those with legal title to their lands, survey data collected in the early 1970s revealed the following distribution (R. Clark 1974: 19-21):

Category of Producer	Percentage of Producers	Percentage of Area
Large (2,500-50,000 hectares)	13	53
Medium (500-2,500 hectares)	37	40
Small (up to 500 hectares)	50	7

These data exaggerate the degree of inequality of landholdings, since a higher percentage of the large enterprises has legal land titles than do medium- and

small-scale ranchers. Moreover, much of the land owned by the larger enterprises is in forests, swamps, or deserts. ^{54/}

There was a tendency, however, towards greater concentration of landholdings, with the larger enterprises sometimes resorting to what Clark calls "land grabbing." Small ranchers are often surrounded by large ones, and have little choice but to market through and buy their inputs and consumer goods from them.

Research by Royden, Wennergren, and Whitaker found that a major factor affecting farmers' net incomes in the Santa Cruz colonization region was transport costs: net income per hectare was inversely related to distance from an all-weather road (Royden 1972; Royden and Wennergren 1973; Wennergren and Whitaker 1976). This suggests that additional road construction in the region can help reduce income inequalities.

Summarizing the sketchy information on income distribution in Santa Cruz is not an easy task. While the Ministry of Agriculture-Utah State University survey found rural income in 1972 to be more equally distributed in the Santa Cruz colonization region than in all other regions except the Yungas, data for individual communities and specific products suggests somewhat greater inequality. Moreover, the rapid growth of commercial agriculture in the 1970s has perhaps benefited large- and medium-size farmers more than small farmers. On the other hand, land is more equally distributed in the Oriente than in the Altiplano and Valles. Although colonists often have the resources to clear and farm only a few hectares, they at least

^{54/}

About 40 percent of the ranches were found to use rudimentary technology and had herd sizes of 500-2,500 head; 40 percent were semi-modern, with 1,500-5,000 head; and 20 percent were modern enterprises, with 4,000-17,000 head.

have the potential to increase production significantly by bringing new lands into cultivation.

INCOME REDISTRIBUTION POLICY

There is considerable debate about the role of the MNR party in bringing about a redistribution of land and income after it took over the reins of government in 1952. A number of writers have argued that the MNR came to power with a clearly defined program of agrarian reform (Alexander 1963; Carballo 1963; Heath [in Heath, Erasmus, and Buechler 1969: 36-50, 371-372]; and Warriner 1969: 243). Others maintain that it developed such a program only after coming to power, and they attacked the program (in polemical terms) for being "Communist" (Ostría Gutiérrez 1958) or "Marxist-Trotskyite" (Stokes 1959). Still others attribute a lesser role to the MNR. Patch (1961a; 1967) argues that the government essentially was forced by campesino unions to legalize land seizures and to redistribute land more quickly than it had planned. Malloy (1970) contends that the MNR was deeply divided over agrarian reform and did not have an official position until 1953; that position, he says, "is best described as one of bowing to the inevitable."

Whatever one's position on this debate, it is difficult to escape the conclusion that the MNR had no real program for increasing agricultural productivity on land received by the campesinos (Carter 1971; Ferragut 1963: 131-132; Menjivar 1969; and Thorn 1971). As Carter puts it, "the MNR seemed more interested in altering the basis of political power than in modernizing Bolivia's agriculture." This view is also held by Alipio Valencia Vega (1972

a former director of the Consejo Nacional de Reforma Agraria, who criticizes the government for using 'campesino unions for political purposes and for paying too little attention to technical assistance, production, marketing, and the persistence of minifundios.

These rather harsh judgments may be tempered somewhat by admitting that the government did seem to have a plan for increasing agricultural production in the Oriente. But most of the increased production was expected to--and did--come from an extension of the agricultural frontier, not from increasing productivity on existing land. And it is still fair to say that the Altiplano, Yungas, and Valles were ignored throughout the 1950s. Even since 1960, these areas have received much less attention than their importance in agricultural production and employment would warrant.

During the 1950s little consideration seems to have been given to programs of technical assistance and supervised credit designed specifically for low-income farmers. Effective programs of this nature probably would have required the establishment of production and/or marketing cooperatives, since administrative costs per farmer would be considerably higher if farmers were dealt with on an individual basis. Cooperatives were in fact established in many areas, but they were imposed from above by the government and often suffered from incompetent or dishonest management (often by outsiders). Moreover, campesinos were given little education in the structure and functions of these organizations. The failure of many cooperatives has given this type of organization a bad name throughout the country, and this has hampered subsequent efforts to establish cooperatives on a more solid footing.

Another problem during the 1950s was agricultural price policy (including exchange-rate policy), which restricted production by placing price ceilings on basic consumption items and by subsidizing food imports. Such policies tended to further limit the ability of campesinos' incomes to rise.

National development plans have generally given agriculture low priority, notwithstanding their brief statements to the contrary. Most of them have lacked the detailed analysis and programming necessary to justify the use of the word "plan," and this shortcoming is particularly true for agriculture. The 1962-71 Plan (Bolivia, JUNAPLAN, 1961), for example, neglects what by 1960 should have been an obvious major weakness of agrarian reform in the 1950s: the lack of agricultural credit. (Indeed, the Plan also neglects credit for non-agricultural activities.) The long-term "Socio-Economic Strategy" document for 1971-1991 (Bolivia, MINPLAN, 1970) devotes very little space to agriculture, and nothing is said about how planned productivity increases were to be achieved.

The 1972-76 Plan (Bolivia, CONEPLAN, 1973b), in the words of a comprehensive sector assessment by USAID/Bolivia (1974: 230), "virtually ignores the agricultural sector." In 1973, however, the government adopted twin sector goals of rising per capita income and a more equitable distribution of agricultural income (USAID/Bolivia 1974: 230-231). Still, efforts since then have been concentrated on the relatively prosperous Department of Santa Cruz, and little has been planned (or done) for the Altiplano, where the problem of rural poverty is most acute. ^{55/} A case can be made for neglecting

^{55/}

In the opinion of the Consejo Nacional de Economía y Planificación (Bolivia, CONEPLAN, 1973a), international agencies were partly to blame for the neglect of the Altiplano. Only 4 of 29 international programs and 18 percent of international resources, it was pointed out, were in the Altiplano. While there is some truth to this statement, it is the Bolivian government which must make the ultimate decision on which type of assistance to seek and accept.

the Altiplano in the hopes of accelerating spontaneous colonization of the Oriente, where settlers' incomes are likely to be higher than in their place of origin; but it is doubtful that this particular strategy of rural income distribution is being consciously pursued.

The national development plan for 1976-80 (Bolivia, MINPLAN, 1976), in fact, does not directly deal with the issues of rural income distribution and employment. And the Plan Quinquenal Agropecuario for the same period (Bolivia, MACA, 1976), while mentioning rural income redistribution as an objective, makes no detailed connection between specific programs and achievement of this objective.

In summary, efforts by the Bolivian government to redistribute rural income have essentially been restricted to land transfers. ^{56/} While this has constituted an obvious redistribution of wealth, and has increased campesinos' potential for significantly higher incomes, government efforts to help campesinos realize this potential were limited until loans from AID, the IDB, and the IBRD were obtained during 1974-76. Campesinos received little credit and technical assistance, and earlier efforts to organize cooperatives apparently were governed more by political than by socioeconomic objectives.

DIRECTIONS FOR FUTURE RESEARCH

Given the paucity and poor quality of data on income distribution in Bolivia, it is tempting to present a laundry list of "high priority" research needs. Such an agenda, however, would be a standardized prescription that

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The Ministry of Agriculture not only has admitted this but also has argued that the economic effects of the agrarian reform on campesinos have been "insignificant" (Bolivia, MACA, 1976: 169-172). The latter judgment, however, is too harsh.

could be submitted for most any less developed country, and it would be utopian to think that more than a few proposals could be acted upon in the near future. Accordingly, an effort will be made to limit the number of high priority activities by focusing on specific policy issues in Bolivia and by taking into account manpower, financial, and data constraints on income redistribution research. (There may also be political constraints, the nature of which should be apparent; but these will not be discussed in this paper.)

Before looking at specific policy issues, there is one general issue, the measurement of income, that merits discussion. One of the greatest shortcomings of existing data is their failure to measure much of the economic activity which does not pass through the market. Since about 57 percent of Bolivia's population lives in rural areas and a high percentage of this group produces food primarily for home consumption, this is a major problem. Macroeconomic statistics on output and income take such production into account (imperfectly), but some of the microeconomic studies explicitly do not, while in other cases it is not clear whether food consumed on the farm is included in income estimates.

Other goods and services produced on farms or in rural communities, but not passing through the marketplace, are almost entirely missed by national income accounting procedures in Bolivia. Rental income is not imputed to housing owners in rural areas, and the very substantial improvement in rural housing (and thus real rental "income") in some parts of Bolivia since 1952 is thus not reported. Reciprocal labor services are important in some communities, but the benefits derived by each partner in such arrangements do not pass through the market and thus are not counted as income. Benefits

derived from community public works projects (which possibly are less important than is commonly supposed) are also not measured as "income." Household production of clothing is still important in some of the poorer regions, though in the relatively high rural income areas almost all clothing is now purchased. Beer production is included in the national accounts, but the production of chicha probably escapes the statisticians' eyes. So do the non-market personal services provided by traditional medical practitioners and private moneylenders, and by family members to each other.

In view of these problems, a strong case can be made for the development of level-of-living indicators based on consumption rather than money income. This is not a particularly easy task, but such indicators should give policy-makers a much better feel for what is happening in rural areas than per-capita income figures, even if reformed. ^{57/} This is particularly true if one wants comparative data on different geographic areas. To take an extreme case, assume that Region A produces potatoes entirely for on-farm consumption, while Region B sells 80 percent of its potato output. If the relative price of potatoes rises (or falls) by 40 percent, there will be little effect, other things equal, on actual living standards in Region A, while in Region B there would be a substantial increase (or decrease). A reformed money income series, however, would show significant increases (or decreases) in Region A's income--and erroneously depict actual changes in well-being. ^{58/}

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An alternative indicator is one based on expenditures, adjusted to include food produced and consumed on the farm. MACA's 1972 survey could provide base data for such an indicator. However, it excludes some important dimensions of welfare which other types of consumption indicators might include.

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Conceivably, a rise in relative potato prices could make the subsistence region (A) worse off if potato seeds are bought in the marketplace and seed prices also rise.

It is not necessary to have a comprehensive rural poverty indicator, though such a measure would be quite useful for showing changes in total income (or, rather, welfare) distribution if agreement could be reached on an appropriate weighting scheme for the various components. ^{59/} The individual indicators would be useful in themselves for focusing on specific public policy issues such as nutrition, housing, education, health, transportation and communications, and public utilities (potable water, sewage disposal, and electric power). Consumption items of less direct interest for public policy-makers (e.g., clothing and personal services) could usefully be ignored in the early stages of such research in order not to place too much of a burden on the country's limited research capacity.

Perhaps one of the best ways to collect this data--and to continue collecting it on a regular basis--would be to utilize university students, each of whom could survey a particular community for his or her thesis project. While academic purists might cringe at the lack of creativity implied by a standardized questionnaire, the benefits could be great, and each student could at least be turned free to speculate on how best to meet his or her community's needs (felt or otherwise).

It would be nice to have consumption data thus collected on an annual basis, but this is almost certainly inadvisable from a benefit-cost standpoint. A more realistic goal would be to survey the original communities,

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The weighting problem might not be too serious. Research by Gary Smith, USDA/ERS/FDD/SAIG, found that a comprehensive rural poverty indicator for Guatemala was not very sensitive to changes in weights for the 8 components used ("Estimating Rural Poverty in Guatemala," mimeographed [December 1976]).

say, every 4 years. From the students' standpoint, the subsequent surveys might be even more satisfying research experiences than the original ones, since sufficient time will usually have elapsed for some significant changes to have occurred. These changes could be examined with simple analytical techniques which require that students speculate on the reasons for the changes and the causal mechanisms at work. From the Bolivian government's standpoint, such a project would produce a body of trained economic researchers who could be productively employed by the agrarian reform and colonization agencies, the nutrition division of the Ministry of Social Welfare and Health, and other government offices.

The foregoing proposal would not be inexpensive or easy to implement. To be meaningful, it would have to focus on a fairly large number of "representative" rural communities throughout the country (30-40?). If, as is likely, 30-40 qualified students and/or sufficient faculty time cannot be found in any one particular year, statistical problems of comparability (though possibly not serious ones) could result by having to stagger the base studies over 2, 3, or 4 years. If the project were also to include major urban centers, the strain on university resources would be even greater. Rivalries among the major university campuses could cause problems if financing for such a project were available and subject to competition; but the unified structure of the Bolivian university system suggests that a cooperative effort involving several campuses would be politically feasible.

Since such a project is not likely to be high on the government's priority list, financing would almost certainly have to be provided largely by development assistance agencies. Project costs would include technical assistance in survey design and implementation; a strengthening of faculty capabilities for thesis supervision (which might be done through in-country

seminars but could involve the hiring of other faculty, preferably from other Latin American countries); payment of transportation costs, living expenses, and perhaps a small salary for students ^{60/}; and data processing. No attempt will be made to calculate the costs of such a project, but grant financing would probably be more appropriate than loan financing. ^{61/}

One has to ask, though, what would happen to the project once grant financing were terminated? Too often, under such circumstances, organizations and programs begin to disintegrate. It is doubtful that a research project on income distribution could demonstrate its worth in only 3-4 years, so an assistance period of 8-10 years would have to be contemplated. Even then, continuity could not be guaranteed even if the project were regarded as successful. Perhaps this is just one of those utopian proposals mentioned at the beginning of this section, but I believe it--or something similar--deserves serious consideration. Alternative ways of collecting income and consumption data are not particularly attractive, since the government seems to be having difficulty meeting the manpower requirements of the projects to which it is already committed.

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Payment of a small salary might be considered, to discourage students from taking full-time jobs while finishing their theses. If this could be done, there is a clear advantage to having the research done by university students rather than regular government employees, who are likely to be diverted from their tasks by desperate supervisors who are faced with manpower shortages for what they perceive to be higher priority projects.

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Partial loan financing might be considered if this project were part of a general program of assistance to the university system, including perhaps a student loan fund. But since the foreign exchange costs would be very modest, some prospective lenders might find it difficult to provide the financing.

Apart from the collection of time series data on rural income (or, preferably, consumption), there are several other areas of research which this writer believes should have high priority. One of these is more detailed analysis of the effects of migration on income or consumption. Some surveys of colonization zones in the Departments of Santa Cruz, Cochabamba, and La Paz have included questions related to this subject, but the information obtained has often been partial or qualitative. A better understanding of the changes in levels of living resulting from migration would be useful in determining how best to allocate government resources among the various regions of the country.

Data on migration trends between 1950 and 1976 will soon be available from the 1976 census tabulations. For purposes of analysis, the absence of an intermediate year is a drawback, though a study of long-term trends would still be valuable. The paucity of data on income and other economic variables will limit migration analysis to very simple models, but it would be interesting to see what the results would be. There may not be enough work here for a Ph.D. dissertation, but this might be a good topic for a Master's Thesis. ^{62/} Other useful research on this subject could take the form of additional surveys of pre- and post-migration income of residents of individual colonies or colonization zones. In fact, it should be possible to obtain this information as part of the ambitious periodic survey project discussed above.

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Zeballos Hurtado's dissertation (1975) is subtitled "An Economic Analysis of Bolivian Rural-Rural Migration," but as he himself explains (pp. 36-37), his purpose "is not to explain the reasons for internal migration in Bolivia [but rather to] assess the economic performance of the settlers and government investment."

Another area in which more research is needed is that of the relationship between technical assistance and income, particularly on the Altiplano, where the quality of pasture lands is deteriorating and campesino incomes are most likely declining in some locations. This does not constitute research on income distribution per se, but it could be important for identifying more effective means of transmitting information on production and marketing. Technical assistance to farmers has been minimal in Bolivia, and efforts in agricultural extension, cooperative formation, and community development have often been outright failures. Moreover, the poor quality or lack of technical assistance has probably been a major reason for the poor credit record of the relatively few campesinos who have received bank loans. On the other hand, there have been some successes. Farmers in some communities, for example, have adopted new potato varieties and have begun to use chemical fertilizers.

The impact of technical assistance on campesinos' incomes is not likely to be great so long as funds for extension work continue to be scarce and campesinos have little access to credit. But an improvement in present programs is very desirable, and research may show that the rate of return on technical assistance is quite high if complementary factors (especially credit and marketing opportunities) are available (cf. Whitaker 1975: 19-20). If so, technical assistance could be an important part of a significant government effort to increase the incomes of the poorest of Bolivia's rural citizens.

Several community-level studies have indicated, not too surprisingly, that the effectiveness of technical assistance depends to a large degree on the nature of the human relations between technicians and campesinos. At present, there is considerable mistrust and misunderstanding on both sides.

Anthropologists, sociologists, and psychologists could help discover how these barriers can best be broken down. One widely-held belief these social scientists have called into question is the supposed predilection of highland campesinos for cooperative or communal work arrangements. While traditional highland societies have developed formal institutions (in the anthropological sense) for organizing cooperative effort, actual use of these institutions appears to be limited. Mutual labor exchanges, for example, are sometimes restricted to relatives. The other side of the coin is that there is a strong predilection toward individual proprietorship. Unfortunately, many Bolivian government programs--as well as foreign advisors--have operated on the assumption that a solid basis exists for communal farm organization. When reality turns out to be otherwise, program disappointments and failures are to be expected. The suspicions aroused among the campesinos make it more difficult to establish other types of cooperative schemes--such as marketing cooperatives or perhaps credit unions--that otherwise might have stood a better chance of success. This communications problem is not going to be solved by economists, and help from other social scientists is needed. Technical assistance from outside Bolivia would definitely be required for such a research project; but the costs would be modest, both absolutely and in relation to the potential benefits.

A research area not focused directly on income distribution, but which deserves brief mention here, concerns the impact of transportation and marketing infrastructure on community income levels. Research in the colonization areas has suggested that the presence of such infrastructure is a major factor explaining income levels in the relatively prosperous communities. It also appears that much (though not all) investment in this type

of infrastructure has had a high internal rate of return, while investment in social infrastructure in directed colonies has been unproductive. Since geographic migration might be viewed by the government as a means of raising campesinos' incomes, research relating to colonization programs (directed or otherwise) should pay more attention to transportation and marketing.

One could identify many other "research needs" related to income distribution in Bolivia, but for a variety of reasons it is this writer's recommendation that they be given low priority. One such area is tax policy, which has already been the subject of one dissertation. Strang (1971) has reviewed a Bolivian government proposal in the late 1960s for a rural land tax designed to increase revenues; simplify the existing rural tax structure, which relied mainly on marketing taxes; and provide incentives for more efficient land use. Since the proposed tax was based on land area, it was regressive for farms of equal size; and since the marginal product of land tended to be below the average for campesino families acquiring more land, a second element of regressivity would be present. It was doubtful, moreover, that the tax would have much of an effect on incentives to increase production, since the relatively high burden on low income groups was still low (2.7 percent) in absolute terms (Strang 1971: 164-169).

Given the strong opposition by campesinos to land taxation, and the lack of significant land taxation in Latin America generally, any rural tax that might be introduced would likely have an insignificant impact on income distribution. Based on the experience of other less developed countries, little can also be expected of efforts to use other types of taxes to redis-

tribute rural income. Additional research in this area, then, is not likely to be very productive.

The returns may also be fairly low for studies of the effects on income distribution of agricultural price policy, notwithstanding the fact that price changes can have a significant impact on farmers' incomes generally or on the incomes of farmers producing specific products. A survey of agricultural price policy by Gardner (1974) concluded that price controls were largely ineffective because the government lacked the necessary capital, storage facilities, and producer confidence. It is clear that many farmers receive less than the minimum established prices for some crops. Another problem confronting prospective researchers in this area is the lack of good data on unregulated prices. Until the government is better equipped to exercise effective controls, research on the distributional effects of agricultural price changes should be postponed until the data base is improved and more is known about farmer response to relative price changes. ^{63/} Meanwhile, agricultural price policy can still keep distributional effects in mind and can avoid changes where the results would clearly be in conflict with distributional objectives.

Research on the marginal productivity of labor can have implications for income distribution, since the inference can be drawn that the government might encourage migration from regions where the marginal productivity of labor is low to regions where it is high. However, rural factor markets

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Preliminary research in this area has been conducted by Morris Whitaker, who cautions that "the statistical reliability of the results is so poor that no meaningful inferences can be made as to the size of the relevant supply elasticities" (1975: 2).

are very imperfect in Bolivia, and this limits the applicability of traditional neoclassical models. Even in the relatively market-oriented Santa Cruz region, as we have pointed out, there are significant wage differentials for similar or even identical work. Furthermore, estimates of the degree of unemployment and underemployment in rural Bolivia differ widely, and the choice of data can greatly affect regional estimates of marginal labor productivity. ^{64/} This, then, is another area where research is not likely to be too fruitful from the point of view of income redistribution policy.

To conclude, it is recommended that the major effort in income distribution research be the development of time series data on key dimensions of consumption for representative rural communities throughout the country. The surveys proposed, of course, should be used to collect other data besides those on income (or consumption) and its distribution. It may well be that these surveys should be carried out by means other than the one herein proposed, and that available human and financial resources will not permit as many communities to be studied as has been suggested. But even a scaled-down version of such a project would be a great improvement over the present decentralized, uncontrolled, and haphazard "system" for collecting data on rural income distribution, no matter how good some of the individual studies might have been.

This is not to say that there is no place for a comprehensive, nationwide agricultural survey such as the one conducted in 1972 or the one presently being considered. These surveys can provide valuable information on

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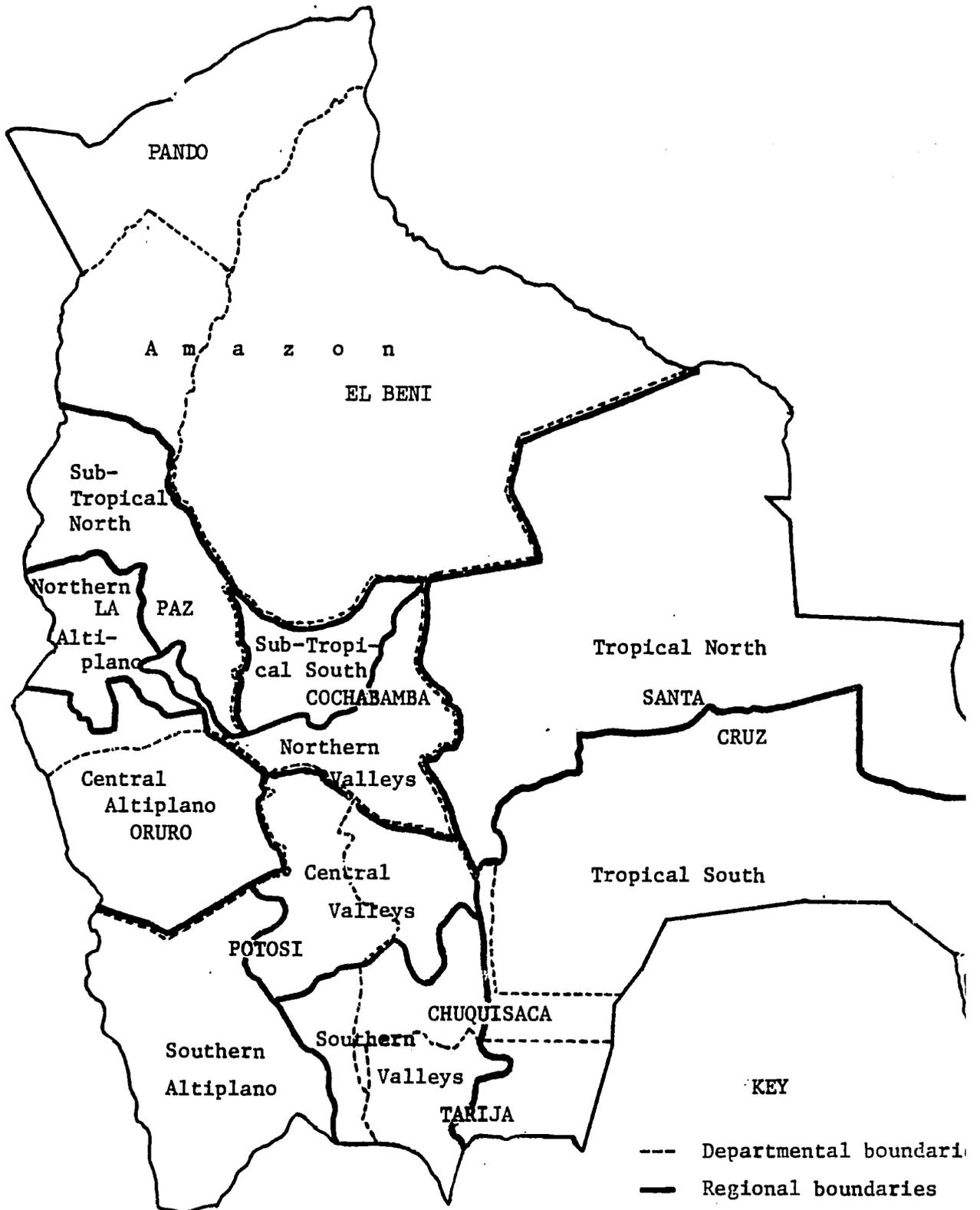
Data on rural employment, unemployment, and underemployment will be reviewed in a subsequent report.

agricultural production trends, changes in land use and technology, and other economic data which will permit more valid generalizations to be made for many issues than the "representative community" approach. The latter, however, can provide more detail in some areas, and this should make it possible to simplify the related sections of the national survey questionnaire.

The complementarity of these two kinds of surveys suggests that the value of each would be enhanced if they were combined or interrelated. While it is unrealistic to think in terms of a comprehensive sector survey every four years, surveys at 8- or 12-year intervals could coincide and be integrated with the representative community surveys. Researchers for the latter could also conduct interviews in their geographic areas for the former.

Admittedly, such a regular schedule of research activities may be asking too much. But if income redistribution is to be regarded seriously as an objective of government policy, there must be some systematic and periodic collection of data to provide benchmarks and to measure progress toward achievement of distributional objectives. If this point can be recognized and accepted, then the exact form of the data collection process becomes of secondary importance.

Agricultural Regions of Bolivia



Source: IDB (1973: 234-238).

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