UNITED NATIONS
ECONOMIC
AND
SOCIAL COUNCIL

GENERAL
E/CN.12/218/Add.2
12 May 1951
ENGLISH
ORIGINAL: SPANISH

ECONOMIC COMMISSION FOR LATIN AMERICA

Fourth Session
Mexico City, Mexico
28 May 1951

DEVELOPMENT OF AGRICULTURE IN BOLIVIA

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DEVELOPMENT OF AGRICULTURE IN BOLIVIA

INTRODUCTION

Until the end of the last century, Bolivia remained isolated behind its frontiers and practically withdrawn from the world economic system. Farming, which was at a feudal stage, with low per capita productivity and very low yields, satisfied domestic food requirements almost entirely, while handicrafts to a large extent met the demand for manufactured goods. In mining, which was the sole export activity, only those ores were extracted which were valuable enough or sufficiently high in grade to warrant the costly transportation. There were relatively few imports, these being confined to some consumer and luxury goods. Later, the industrial countries were compelled, through the growing demand for minerals, to seek new sources of raw materials abroad and they made heavy investments in order to gain access to Bolivia's tin and mine it on a large scale.

The construction of the first railways, designed almost exclusively for the export of minerals, did not directly benefit the farming regions, yet caused a radical change in the country's economy. The railways brought in their wake foreign skill, capital and men to conduct large-scale exploitation of Bolivia's extraordinary mineral wealth, in particular tin.

The high demand for its ores permitted Bolivia to enter into closer contact with the world market and to expand its trade considerably. Increased exports made it possible to import foods and consumer goods required by the increasing demand of the mining camps and the urban population, which could not be met by domestic production. This transformed the country's economy until it became almost entirely dependent on the various factors governing the world market.

In this way Bolivia's development followed patterns similar to those of other Latin American countries with a numerous indigenous population and traditional systems of agriculture. The impoverished farm lands, unfavourable weather conditions, serious transport

/difficulties as

difficulties as well as systems of land tenure and labour which were essentially feudal, offered no incentive for the capital investment and the introduction of modern methods. Agricultural production therefore tended to continue along its precapitalist subsistence lines with very low per capita productivity. On the other hand, mining became a highly capitalized industry employing foreign technological skills on a broad scale. Thus a small, highly efficient and productive sector was created which together with associated activities, absorbs only a small proportion of the total population.

This development created a dual economic structure in which a small sector developed in close harmony with the world economic system, giving rise to considerable trade, which a much broader sector remained practically shut off within its ancient customs, at a subsistence level, unresponsive to the impact of new economic incentives.

Foreign trade and improved communications fostered imports of all kinds of consumer goods, and permitted these to compete favourably both in quality and price with those produced locally. This was largely responsible for the continuance of the traditional rate of domestic farming, as the products of the semi-tropical eastern plains were entirely displaced on the principal High Plateau markets, which can more easily be supplied from abroad. The farming activity of these fertile regions has thus remained undeveloped, and they have been relegated to almost complete isolation. One of the major contributory factors to this situation is transport, which is very difficult indeed and is prohibitively costly. Farming in the valleys and on the High Plateau was not so greatly influenced by the impact of the new flow of imports from abroad, the only product immediately affected being wheat, when large quantities of foreign flour were imported; these regions have, therefore, during the last fifty years, retained their traditional structure with only slight, sporadic attempts at modernisation which have had no influence on development.

Nevertheless, the other sectors of the country's economy have not remained stationary. The productivity of mining was improved through technical progress, industry began to develop more rapidly, and there was a considerable increase in urban building and commercial

/activities, all

activities all tending to raise the real income of the population.

This higher income, and in particular, the migration of considerable numbers of peasants to the cities, resulted in greater consumption of foodstuffs by the urban population or, where there was no actual increase in consumption, a radical change in the composition of the diet of those people who moved to the cities. There is, moreover, a gradual change taking place among the peasant population, as, from being almost completely self-sufficient, the countryside is now becoming a part of the monetary economy.

As agriculture remained static, during the last quarter of a century it has been unable to meet the growing demand for foodstuffs, either in quantity or in variety of products. It has been necessary to expand imports steadily in order to meet the great deficiencies of domestic production, above all as regards certain basic foodstuffs (wheat, sugar, rice, meat and milk) and various agricultural raw materials (cotton, wool, oilseeds, hard fibres, etc.).

During the 1945-49 period, 38.5 per cent of the total value of imports had to be assigned to foodstuffs and agricultural raw materials. Such great dependence on foreign supplies of goods which could easily be produced within the country restricts the imports of other commodities, such as capital goods, which are more indispensable for economic development.

Between 1925 and 1949, it appears that agricultural production increased to a lesser degree than the growth of the population and its increasing demand. It was not until 1946 that the Government policy of fostering agriculture, subsidy prices for some cereals and the general rise in prices for agricultural products, provided greater incentives for production, which, favoured by excellent weather conditions, increased considerably. Wheat provides an interesting example (purchases by the flour mills rose between 1946 and 1949 from 7,696 tons to 20,657 tons), as well as the intensification of agriculture in the eastern region of the country (Santa Cruz) where Bolivia's new farming is developing with essentially dynamic features.

Agricultural Production and Economic Development

Excessive concentration of the rural population in the least fertile regions, difficult communications, systems of land tenure and labour, and the absence of education among the peasants, together with many other factors, seem to have combined to prevent farming from playing a dynamic role in the country's economic development. In fact, the great majority of the rural population has remained withdrawn into its old traditional customs, scarcely becoming assimilated at all into a monetary economy. Modern farming technique has been absorbed to a minimum degree by a small sector of agriculture; the remainder continues to use primitive methods of an essentially colonial nature, and consequently per capita productivity is small. This is largely the result of the surplus of farming population, shortage of capital, and adverse natural and social conditions.

The large concentrations of population on the High Plateau and in the numerous small valleys of the mountainous region date back to the pre-Incaic period, and are very probably due to the displacement of population surpluses from the regions closer to the coast. Later on, demographic growth exerted severe pressure on the more fertile lands, and it became necessary to cultivate broken surfaces with steep gradients requiring a large quantity of labour but producing low yields in spite of this. The mountainous contours of the terrain and the resultant transport difficulties in these sectors, added to the scanty means at the peasants' disposal for counteracting the unfavourable conditions of the tropical climates, prevented the population from extending towards the eastern plains. The Spaniards thus found densely populated regions where the Incas had introduced the system of communal agriculture in order to facilitate production and regulate distribution.

The conquerors introduced a feudal system which reduced the indigenous population to the level of serfs. The advent of the Republic did not bring with it any radical changes in the situation, and apart from granting the peasant nominal freedom of action, sealed his fate by introducing or continuing a system of land tenure which, with few changes, kept him in almost the same conditions as before.

/The real reason for

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

Concentration of the land in the hands of a relatively small group of owners, and the habit of paying for farm work by handing over fairly small areas of land from which the worker should obtain his livelihood has had the following results:

1. It has ket the living standards of the peasant very low, as the area of land granted to him, with rare exceptions, is small and weather hazards as well as primitive working methods prevent him from obtaining anything more from the land than what is strictly necessary for his livelihood, his real income is thus amoung the lowest in America.

2. The peasant's poverty and the almost entire absence of eduction have combined to keep him practically ignorant, so that it is difficult for him to assimilate progress.

3. Demographic growth has created severe pressure on the lands handed over to the peasants, causing sub-division in some cases and emigration in others.[1/] As they are strongly attached to their own ways of living and to their own plots of land, while at the same time they do not understand the language and customs of other regions, the majority of the indigenous elements (Quechuas and Aymarás) seek agricultural employment in neighbouring regions or at best, move to the cities. There has been some migration abroad from certain regions in the south of the country, but only in very few cases has there been a movement towards the unpopulated and semi-tropical, but potentially rich, plains of the East.

1/ As a general rule the proprietor does not change the area which he uses for his own exclusive benefit. The part assigned to the peasants consequently has to maintain all the surplus population which remains on the farms. Only when he requires a greater number of workers does the landowner allot new plots for their maintenance.

/More usually,

More usually, the population remains in the same region, so that the large labour force on the estates persists. When the peasants have been able to accumulate small savings, they have tried to purchase little farms which would give them absolute independence, even though this entailed a drop in their already low standard of living. This has caused excessive sub-division in various regions, giving rise to a serious problem for the development of agriculture.

4. The dense population on the High Plateau and in the valleys has tended to perpetuate the system of low remuneration for farm work. Consequently technical progress and an improvement in the prices of primary goods have been discouraged to the extent that mechanisation is uneconomic. Initial steps towards farm mechanisation seem to have been originated already in some regions through the absorption of this surplus population by industry and by urban development. For this to continue at the desirable rate it will be necessary, however, for large masses of the population to be absorbed by industry or transplanted to the fertile lands of the eastern plains for employment in farm work.

The points enumerated above provide an idea of the vast retarding influence on agricultural development of the large amount of cheap labour available and the prevailing systems of land tenure and remuneration for work. The methods of cultivation have remained unchanged through the course of centuries and this explains why wooden ploughs drawn by oxen predominate today, although in some parts it is still possible to find entirely manual labour whereby sowing is carried out by means of opening holes in the soil with sticks, or where the soil is upturned by means of the "chaqui-taklla".[1/] Harvesting and particularly grain threshing is done by hand with the aid of sticks. Therefore a very great amount of man-hours are necessary to grow any crop and this explains the need for a large number of workers to attend to the tilling of any estate. This

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1/ A kind of stick made of wood with a supporting device on the lower handle used as a footrest to help in inserting the implement into the ground. It is used for work similar to ploughing.

This explains the minimum amount of cultivation on the great estates where, under the pretext of the land lying fallow within a very extensive rotation plan, large areas are left untilled. There are cases on the High Plateau of the land being sown only once every ten or more years. This sparse capacity is in turn responsible for the physical impossibility of the peasant being able to improve his living standards. The short time at his disposal[1/] for working his own land only allows him to cultivate a small area each year.

To the foregoing must be added the scanty and uncertain yield of the arable lands. Except for some valleys which annually receive the benefits of washings from the hills containing fertilising loam and the eastern plains where relatively new lands are being cultivated, Bolivia's soils are exhausted by hundreds of years of incessant cultivation without benefit of fertilisers which would restore lost fertility or of practices which prevent erosion. Unfavourable weather conditions very often lead to the almost total loss of the efforts employed in cultivation. Finally the precarious nature of agricultural technique means that methods of counteracting some of these adverse factors are unknown; the proportion of irrigated lands is very low indeed, seeds used are degenerate and unsuitable for the soil conditions, and agricultural pests and diseases destroy a fair proportion of the harvests, since there is no knowledge of how to combat them.

It is easy to understand that with such adverse climate and soil conditions, and no effective means of counteracting their pernicious effects, productivity per capita is very low, and consequently receipts from agriculture are small. At the worker level, these receipts only permit him a precarious standard of living, as the greater part of his scanty production has to be used for food and clothing; the small surpluses which he may at times possess are exchanged for the few goods needed for this work and his other limited activities. Only in isolated instances on the High Plateau, and somewhat more frequently in the country's richer valleys, are there cases of

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1/ He only has 43 per cent of a complete week for himself, as by law he has to work 4 days for the estate owner and only 3 for himself.

peasants who (by means of commercial activities, seasonal work in the mines, or household industry which they can undertake at times when farm work leaves them freer) can accumulate savings which permit them either to achieve partial improvements in their standard of living or to purchase small farms.

At the proprietor level, the low productivity and small receipts are a paultry source of savings. When it is possible for these to be accumulated, they are seldom re-invested in capitalisation of farming, but are frequently used in activities outside agrarian production or, at best, in purchasing new lands to be worked in the traditional manner.

Capitalisation of Agriculture

One of the outstanding features of Bolivian agriculture is the almost complete absence of either fixed or working capital investments. As already explained, the work is mainly carried out on the basis of remuneration in kind (land, part of the harvest or subsistence requirements). In many places the peasant himself has to provide the working implements; when the proprietor provides them, they are of a primitive type very often made by the workers themselves. Seeds are usually retained from the previous harvests, or at best are the result of a hasty selection. Investments in buildings, storehouses, fences and machinery, and even irrigation works, are of very little importance in comparison with the area under cultivation or the value of production.

It is estimated that less than 600 proprietors throughout Bolivia have invested capital in the purchase of farm machinery.[1/] In spite of the fact that the country has no fertiliser industry, only an average of 146 tons a year of fertilisers were imported in 1945-49.

1/ Altogether, 845 tractors were imported from the United States from 1925-1929 (about 98 per cent of the total tractors imports), of which, judging by size, less than 600 were for farming. Between 1931 and 1949 there were also imports of 3466 ploughs, 597 harrows, 128 grain drills and 152 threshers and combines.

1945-49.

Use of agricultural science is very limited, as there are few agronomists and in general they are not engaged by the estate owners, as the payment of their services would entail the use of working capital which the landowners either do not have or are not accustomed to spending on their farms.

The Government, on the other hand, has paid more attention to other sectors of the national economy. The Ministry of Agriculture, an institution entrusted with agricultural research and the improvement of technique, has always had few funds, preventing it from developing on the scale necessary to give a strong incentive to the development of agriculture and to foster its capitalisation. Nevertheless, this Ministry's action has produced some positive results such as that of spreading the advantages of mechanisation through its service of renting agricultural equipment; moreover, after 1945, it initiated the Servicio Cooperativo de Estaciones Experimentales, the benefits of which are now beginning to be evident.

Although several irrigation projects have been studied, construction of only two has commenced, one,"La Angostura", being near completion, and the other at the half-way mark.

Direct government assistance to the capitalisation of agriculture, in the form of specialised development loans, has been provided only to a very limited extent. A tentative estimate for the year 1946 1/ shows that only about 2 per cent of the total value of production was financed by means of loans from the Banco Agrícola. Moreover, only a small part of these loans were directed towards the small farmers or towards the production of any particular crop. Shortage of capital prevented the Banco Agrícola from providing greater assistance to the producers or even from introducing a specific policy of covering the cultivation of certain crops.

Construction of roads and the improvement of communications also forms part of the capitalisation of agriculture. At present the road and railways systems are very deficient, not only because they are inadequate in relation to the area and topography of the territory but also as regards quality and maintenance. As a result, transport is very scarce and costly, so that the farming regions are not linked

1/ Made on the basis of data covering loans granted by the Banco Agrícola and the value of agricultural production calculated by the Banco Central.

with the different markets and many of the country's richest regions remain marginal. Transportation is really one of the principal obstacles to agricultural development.

The Eastern Plains region is undoubtedly the one most affected by lack of suitable communications, and its considerable agricultural potential has scarcely been tapped at all . There is no doubt that this difficulty has been the major contributory factor to maintaining the present low population density of the region.

As already indicated, the population of the valleys and the High Plateau is unwilling to move to the tropical regions; there is, however, no basic reason why the peasants should not become acclimatised. It is probable that good results would be obtained from any properly organised effort to transfer large groups of this population; it is also possible that such a colonisation project using native elements would be less costly than one using immigrants, although it might take much longer.

There are, moreover, other obstacles to the capitalisation of agriculture, apart from those already mentioned. There is no economic incentive to increase production. The Government's price policy, designed to limit as far as possible any sharp rises in essential commodities - a praiseworthy measure for protecting the urban consumer - during a period of considerable inflation, has meant subsidising imports by granting preferential exchange rates, and the fixing of ceiling prices for domestically produced foodstuffs. These measures have removed all incentive from domestic production, as imported foodstuffs or raw materials reach the country at low prices and provide strong competition.

The incentive to produce is further reduced by the absence of efficient distribution systems, and the inacessibility and poor integration of the markets. Even under existing transport difficulties it would be possible to integrate the different farming regions of the

the almost immediate saturation of the local markets and resultant falls in prices.

A well directed policy towards capitalisation and technical improvement of farming for the primary purpose of developing production of all those articles with a large consumption which at present have to be imported - wheat, sugar, rice, meat, milk, oilseeds, coffee, cotton, wool and hard fibres - might be the starting point for a vigorous impulse to the country's general economic development. Bolivia has the land and the labour necessary to carry out such a programme and not only to meet domestic requirements, but to have an exportable surplus of some products with a high value. The present world shortage of some agricultural raw materials and foodstuffs, their high prices and very encouraging prospects, appear to provide the tangible opportunities in this connection.

CHAPTER I AGRICULTURAL DEVELOPMENT OF BOLIVIA

Development of agriculture and animal husbandry

Despite the fact that Bolivia is eminently a mining country it is, in fact, essentially agricultural, more than 75 per cent of its population depending directly on agriculture for their livelihood. Official estimates[1] indicate that 80 per cent of the gainfully employed population is engaged in agriculture and animal husbandry. Rough estimates of the quantum of national production[2] suggest that the contribution of agriculture (including fruit growing, livestock production and its by-products) is much greater than that of any other economic activity in the country, including mining. Were an estimate made of the National Income in 1946 on the basis of these data, agriculture and livestock products would represent about one third of the total, the position of mining being substantially below this level. However, though agriculture and animal husbandry form so important a part of the country's economy, they are inadequate to cover domestic demand.

Innumerable hindrances, of a physical, social, political, economic and technical order - which will be duly analysed below - have not allowed Bolivian agriculture to overcome its marked pre-capitalist deficiencies to any extent nor to lower the large proportion of subsistence of agriculture. The sharp rise of foodstuff and agricultural raw material imports leads to the conclusion that the percentage of domestic production, which supplies the growing domestic demand, has gradually become smaller.

No statistical information is available by which the trend of domestic agricultural production can be roughly measured. Existing official data for four or five different years, starting with 1938, are

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1/ Data published by the Ministry of Foreign Affairs of Bolivia.

2/ Memoria of the Bolivian Central Bank, 1948.

/contradictory and

contradictory and seem, in some cases, to be entirely out of touch with reality since they appear to indicate expansions or contractions which would be impossible within the relatively static development of Bolivian agriculture. According to this material, the total production of nearly all crops in 1949 was greater than in 1938, but especially in the case of potatoes, quinua and sugar cane, all three of which show increases of more than 300 per cent. Though quinua production in 1938 was estimated at 3,382 tons, it reached 18,000 tons in 1949, that is, an increase of 432 per cent. Over the same period, potato production rose from 92,442 to 406,000 tons, that is, an increase of 339 per cent. Wheat production, however, shows a reduction of 15.6 per cent, whereas domestic wheat purchases by the mills showed an increase of 189 per cent from 1938-49. It should also be pointed out that this was the only crop which was given any efficient assistance from the Government. The contradiction becomes even paradoxical when the increases or decreases of production are compared with the fluctuations of the cultivated area. The most outstanding example is that of maize production, which, according to official sources, increased 135 per cent over the aforesaid period, whereas the total area cultivated with this crop increased 336 per cent. It is impossible to believe that so great an increase in the cultivated area could have occurred under conditions of extraordinarily decreasing yields, since according to the figures recorded in 1938, the yield per hectare was 29.7 metric quintals - one of the highest known averages -- whereas in 1949 it would have been only 16 metric quintals per hectare. On the other hand, the yield of potatoes and quinua appear to have practically doubled. Based on reliable data which are available for both years, climatic conditions appear to have been relatively normal, and it is therefore impossible to admit the occurrence of these sudden changes.

Taking into account the systems adopted in making the aforementioned estimates, it is likely that those for 1949 are the more accurate of the two. However, for the purposes of the present report, these figures will only be used for comparative purposes, since they throw no light on the tendencies of agricultural production (see Table 1).

/Table 1

Table 1 Bolivia: Estimates of production and of cultivated areas for the principal crops

	Production (tons)				Cultivated area (hectares)			
	1938[a]	1941[a]	1946[b]	1949[b]	1938[a]	1941[a]	1946[b]	1949[b]
Rice	8,476	8,476	15,000	18,400	..	8,700	7,500	12,267
Oats	700	612	900	900	..	620	..	1,125
Barley	28,077	61,796	36,000	36,500	37,347	44,150	..	52,143
Maize	80,139	71,600	150,000	188,000	26,956	40,900	83,333	117,500
Quinua	3,382	4,630	20,000	18,000	6,749	4,630	20,000	22,500
Wheat	32,641	33,400	14,000	27,570	34,470	44,000	18,600	37,000
Potatoes	94,442	76,700	400,000	406,000	26,213	13,950	80,000	62,462
Oca	8,560	9,100	9,000	9,400	3,678	3,250	3,000	1,157
Cassava	32,665	20,150	220,000	30,100	4,089	8,000	9,680	3,763
Coffee	19,705	11,500	1,800	1,800	..	..	..	900
Tobacco	3,335	3,320	2,960	2,960	3,075	2,200	..	1,940
Sugar cane	..	47,000	..	236,000	..	1,100	..	5,900
Cacao	7,336	5,810	4,856	4,298	17,465	..	15,000	3,587
Broad beans	5,815	..	6,000	9,000	3,969	..	7,500	5,294

Source: a/ Dirección General de Estadística. Estadística Agrícola 1938 - 1941.

b/ Dirección General de Economía Rural, Ministerio de Agricultura.

After this readjustment, agriculture followed the same pattern observed heretofore, that is a secular type of agriculture, in which there was an almost absolute lack of funds either for investments or as working capital; the technique was primitive and a high percentage of agriculture remained solely at subsistence level. The cultivated area remained unchanged and yields were subject to alterations in climatic conditions, though no improvements were attempted. The eastern part of the country, with its immense resources in fertile soil and favourable climate, remained economically isolated from the rest of the country and merely supplied local demand for foodstuffs. Only from time to time did a few farmers seek to better agricultural production, introducing farm machinery, improved livestocks, and other technical improvements. These initiatives, however, were not followed up by the majority of the great landowners, and the system of cultivation, on the whole tended to remain unchanged.

The increment to population and greater economic activity brought about by the intensification of mining and foreign trade, together with the deficits of domestic production resulting from bad harvest in abnormal years and the limited capacity of expansion, led to increased consumption which was met by increasing foodstuffs imports.

/In the impossibility

In the impossibility of using the aforesaid data as a means of analysis to verify the rate of expansion of agricultural production, it becomes necessary to have recourse to other elements which facilitate the measuring of the variations of the past 25 years.

Until the beginning of the present century, when the country's principal centres of consumption were connected with the outside world by means of railways, Bolivia was practically self-sufficient insofar as foodstuffs are concerned. Agricultural production was able to meet the limited requirements of domestic consumption entirely. Production in the high plateau region was sufficient to cover regional demand for potatoes, barley, quinua, broad beans, mutton, wool and part of the beef and pork. Nearly all these products were found in the valleys, together with the wheat and maize required by the greater part of the country. The plains of Santa Cruz amply supplied domestic demand for sugar and rice, and a surplus was exported to Northern Argentina and the Southern part of Peru. The construction of the railways revolutionised the structure of Bolivia's economy. Mining production increased together with foreign trade, creating new sources of income which, in time, raised the level of consumption, especially of foodstuffs.

As a result of this revolution in the country's economy, agriculture was completely disorganised. Railway transport facilitated the entry of foreign agricultural produce which was of higher quality and was offered at lower prices than its national counterpart. This, for instance, occurred with sugar, rice, flour, etc., these products flooding the country's principal markets and rapidly displacing domestic production. In these circumstances, cultivation of rice decreased sharply barely sufficing to meet demand in areas surrounding the production centres. The greater part of sugar cane production was diverted to the manufacture of alcohol. Wheat production in the central valleys seems to have been rapidly supplanted by maize - a hardier crop - with a much higher yield.

/At the beginning

At the beginning of the period 1925-49, agriculture's position was more or less as decribed above. Domestic production supplied demand for a few basic foodstuffs such as potatoes, meat, barley, quinua, vegetables, coffee and fresh fruits, but it only covered part of the demand for wheat, sugar, rice, brewery barley, milk, edible fats and ají (Chili peppers), the the rest being supplied by imports.

As has already been shown, the lack of statistical data and even of mere estimates of the total volume of agricultural production during this early period, make it absolutely impossible to verify the proportion in which domestic production covered domestic demand.

It is perhaps possible to hazard some conjecture as to the true position. Wheat production could hardly have been enough to supply more than 10 per cent of domestic demand, that is, about, 3,000 tons. Nearly the whole of this crop was processed in numerous low-capacity stone mills, and the wholewheat flour met with growing competition from imported white flour, the price of which was low and the quality high.

Rice production was small and concentrated on the eastern plains and in a few valleys with semi-tropical climate, being barely sufficient to meet local demand. The principal consumer centres were exclusively supplied with imported rice. The same applies in the case of sugar; the limited amount produced in the eastern area, possibly ranging between 500 to 800 tons, only sufficed to cover part of the regional consumption, while the rest of the country imported more than 14,000 tons. (1925)

During this period, domestic production of beef, lamb and pork practically met domestic demand, which apparently was rather low. Industries absorbing agricultural raw materials had not yet developed, so that the volume of imports of fibres, wheat grain[1/] and cacao was limited.

Imports of Foodstuffs

The deficiency of agricultural production compelled the country to use a growing proportion of its import capacity in purchasing agricultural foodstuffs and raw materials.

During the five-year period 1925-29, the value of foodstuffs imports

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1/ Only wheat flour was imported.

amounted to 22.3 per cent of the total value of imports; that is, of a total of 68.1 million 18-penny bolivianos, 15.2 million bolivianos were spent on foodstuffs. The only group of imports surpassing the volume during this period was textiles and textile manufactures, which absorbed 26.7 per cent of the total foreign exchange expenditure on imports. During the period 1945-49, Bolivia depended to an increasing extent, on foreign supplies for basic foodstuffs and agricultural raw materials for its industry. Foodstuffs, livestock for slaughter, became the most important group in the import trade, constituting 33.5 per cent of total imports. The group of textiles and textile manufactures takes second place, being equivalent to 16.5 per cent of the total value of imports.

Foreign purchases of foodstuffs and textile raw materials in 1945 and 1949 called for an expenditure of 76.1 million 18-penny bolivianos as against a total import expenditure of 197.9 million bolivianos.

The excessive proportion of scanty foreign exchange availabilities which must be employed annually in importing foodstuffs and agricultural raw materials - the majority of which could well be produced in the country - affected domestic economy seriously; because of this circumstance other essential goods were sacrificed, amoung which are imports of capital goods.

In the absence of further data which would make it possible to estimate the development of agricultural production, it is necessary to resort to the foreign trade statistics for foodstuffs, cattle and agricultural raw materials, in order to determine, even very roughly, the trend during the last 25 years.

Imports of processed and non-processed foodstuffs together with livestodk for slaughter (41 products which make up more than 98 per cent of total imports in this group), remained almost unchanged during the period 1925-1930. (See Table 2 and Chart 1)

/Table 2

Table 2 Bolivia: The Quantum of Total Imports and of Foodstuffs

(Values at 1937 prices. Thousands of 18-penny bolivianos)

Years	Total imports	Total of agricultural origin 52 articles a/	Total foodstuffs 41 articles b/	Basic foodstuffs c/	Foodstuffs which are not included in general consumption d/	Livestock for slaughter, fresh and dried meat	Fats and oils e/
1925	46,694	10,635	9,008	6,101	1,355	426	481
1926	50,244	11,430	9,718	6,593	1,220	968	517
1927	47,980	11,686	10,117	6,700	1,301	1,068	403
1928	56,780	10,139	8,602	5,018	1,207	1,394	301
1929	55,760	10,359	8,634	5,871	1,167	742	327
1930	48,950	10,625	8,482	5,817	1,098	762	290
1931	27,520	8,183	6,443	4,693	692	529	206
1932	24,350	8,435	5,940	4,426	745	410	120
1933	35,129	7,962	5,557	4,676	415	66	101
1934	59,946	7,812	4,985	4,138	375	88	78
1935	61,109	8,287	6,116	5,155	422	138	78
1936	51,794	12,152	9,913	7,505	602	650	458
1937	55,900	15,004	11,791	8,007	661	1,595	619
1938	68,210	19,367	16,711	10,101	954	3,873	561
1939	65,417	20,159	16,720	9,180	1,040	4,941	966
1940	64,365	21,729	18,668	10,577	1,668	3,886	1,394
1941	85,379	34,152	29,502	13,920	2,773	6,158	3,483
1942	80,877	35,505	28,935	15,727	2,641	6,847	1,619
1943	88,225	36,012	29,881	12,519	2,139	10,173	3,907
1944	84,839	36,564	30,528	13,801	3,185	9,356	2,526
1945	73,620	32,002	26,151	13,621	2,835	5,820	2,264
1946	82,291	31,881	24,581	13,377	2,817	5,009	2,312
1947	81,707	29,415	23,437	10,839	2,467	5,535	2,407
1948	87,395	26,129	22,350	12,939	2,690	4,838	1,203
1949	94,187	25,747	19,465	11,103	2,755	3,115	1,803

Source: Basic data from Anuario de Comercio Exterior (Foreign Trade Annual) 1925-1949.

a/ Includes foodstuffs and raw materials of agricultural origin.
b/ Includes only foodstuffs, raw materials for foodstuffs and cattle for slaughter.
c/ Includes wheat grain, wheat flour, rice and sugar.
d/ Includes condensed milk, butter, cheese, eggs, fresh and dried vegetables, fresh and dried fruit, preseved fruits, coffee beans and ground coffee, cacao, chocolate, tea and chili peppers.
e/ Includes lard and edible oils.

/However, after 1929,

CHART 1

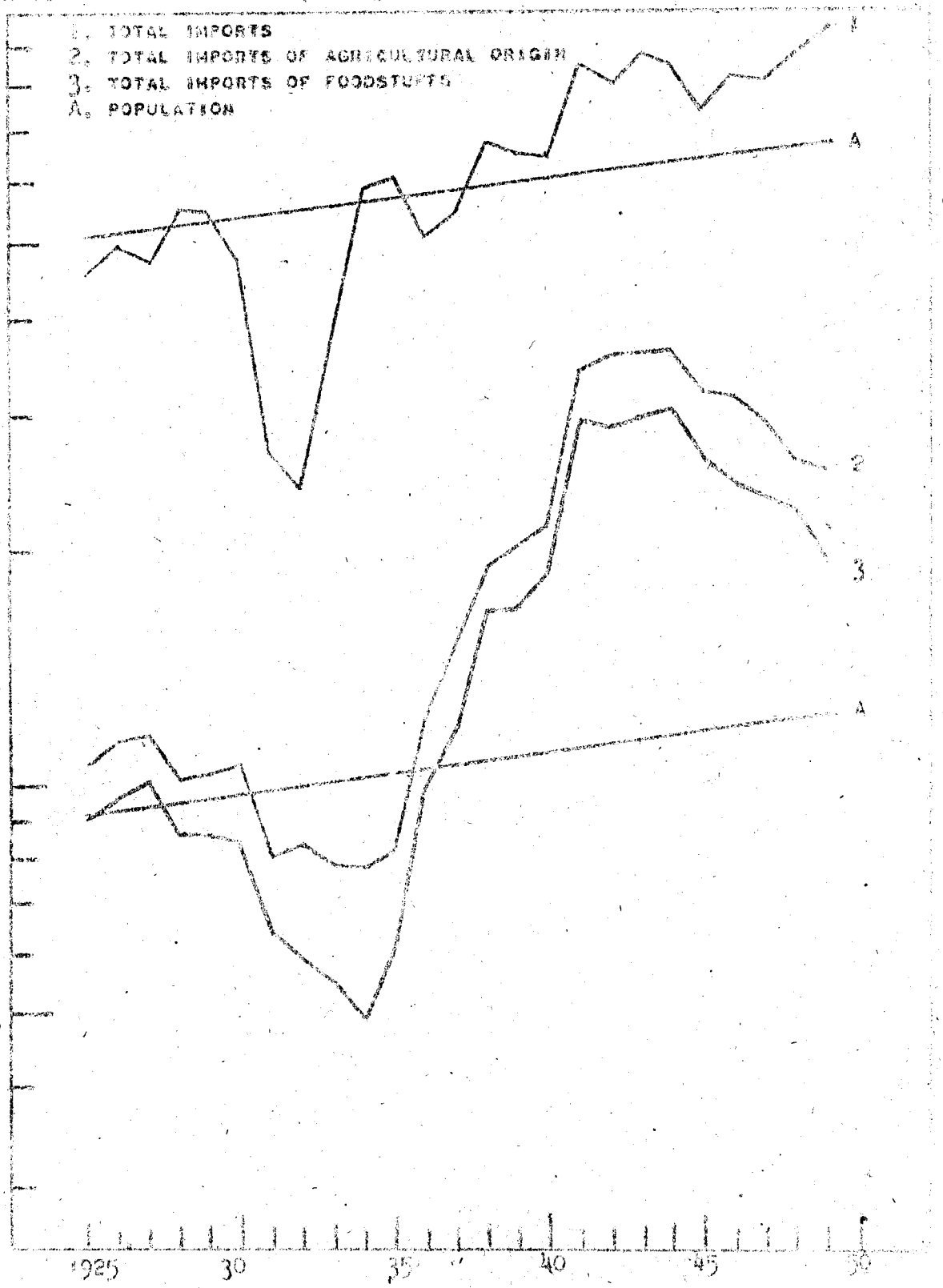
BOLIVIA

EVOLUTION OF TOTAL AND AGRICULTURAL IMPORTS

VALUES AT 1937 PRICES

MILLIONS OF BOLIVIANOS (18 D.)

SEMI-LOGARITHMIC SCALE



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However, after 1929, the World Crisis and the subsequent fall of both prices and ore exports provoked a serious upheaval in Bolivia's economy, consequently weakening its capacity to import. This situation led to a violent contraction of imports as a whole. Imports of foodstuffs, however, diminished to a lesser extent despite the fact that between 1929 and 1932, Bolivian harvests were extremely good,[1/] thus offsetting the shortage of certain foodstuffs. Moreover, the abundance of the harvests, together with the weakened purchasing power of the population, caused a sharp fall in prices; whilst the quantum of total imports fell 52.7 per cent in 1932, as compared with the period 1925-29, that of foodstuffs fell only 35.5 per cent. This decrease, however, persisted (though at a lower rate) until 1934, when the quantum of foodstuff imports was 45.9 per cent lower than in 1925-29. After 1935, a rapid increase occurred in these imports, so that in the course of two years, imports had recovered the level obtaining prior to the Chaco War (1932-35). The upward swing continued at an increasing rate, until 1941, when the rate of expansion slowed down for the next three years. Imports reached their maximum level in 1924, when their volume was 231.2 per cent higher than in 1925-29.

Since 1945, imports of foodstuffs have decreased slightly and this downward trend was maintained at a constant rate until 1948. In 1949, however, imports of foodstuffs fell sharply, due to abundant domestic production of agricultural goods and especially to the expansion of wheat production and the better utilization of domestic cattle. During the periods 1940-44, and 1945-49, imports were 198.4 per cent and 152 per cent higher than in 1925-29, respectively.

If the period of depression caused by the World Crisis and the Chaco War are not taken into account, it will be noted that a comparison of imports and of the growth of the population reveals that the former expanded at a much higher rate than the latter. Per capita imports during the period 1940-44 had increased 147.6 per cent and in 1945-49 they were 98.3 per cent higher than in 1925-29.

Foreign exchange availabilities have undoubtedly influenced the quantum of imports. About 80 per cent of the value of foodstuff imports

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1/ Bolivian Central Bank Memorias 1929-1932.

is made up of essential goods (wheat, flour, sugar, rice, meat, lard and edible oils), which form the basic urban staple diet of Bolivia. The Government has maintained prices low, and made supplies ample enough to meet the greater part of demand. It follows, therefore, that under the regime of exchange control, these imports have always held priority. In order to facilitate the present analysis, it will therefore be assumed that demand for imported foodstuffs has been met without the restrictions imposed by the shortage of foreign exchange.

Disregarding this factor, the trend of the foodstuff import indices may be explained in one of two ways: 1) that per capita demand increased substantially and that there was a change in its structure, due to the increase of income accruing both from urbanization and the increase of economic activity in the country (industrialization, building, mining), which would imply that the growth of agricultural production was lower, or, at best, only equivalent to that of the population, at least until the period 1940-44. 2) Alternatively, it may be that per capita demand remained stable, despite the changes in the composition of Bolivian diet, which would mean that agricultural and livestock production had decreased considerably.

Taking into account the innumerable factors which have influenced Bolivian economy, and especially its agriculture, it is likely that the former of these hypotheses is the more accurate.

In fact, various isolated data suggest that per capita income has increased considerably between the beginning and the end of the last quarter century. Moreover, these data would appear to indicate that, owing to this and to the fact that at very low consumption levels, the increment to income tends to produce a proportional increase in demand for foodstuffs, practically equaling the rise of the former, per capita foodstuffs imports almost doubled and were proportionately much greater than imports as a whole. Thus, whereas between the period 1925-29 and 1945-49, per capita food imports increased 98.3 per cent, total imports only increased 27.9 per cent (See Table 4).

From the following facts it may be deduced that per capita income has increased:

1. The educational effects of the Chaco War on a large number of the Indian

/population and the

population and the intensification of economic activity in the country has produced a sharp increase in the trend towards urbanization since 1932. The principal cities, and especially La Paz, have developed at a very high rate. Thus, between 1928 and 1948, the population of the Bolivian Capital increased 111 per cent. The population of the town of Cochabamba increased 107 per cent between 1936 and 1948, whilst that of Santa Cruz expanded 59 per cent and Potosí 40 per cent.[1/] The mere fact that so considerable a migration of the rural population to the town occurred indicates that there has been an increase in the real income of the population. Even in the extreme cases, when the native Bolivian population moves towards the towns, it maintains its former mode of life almost unaltered, earning a money wage which enables it to improve the food consumption standard.

2. The sharp expansion of industrial production allied to a per capita increase in average imports of manufactured goods, is also another indication of the increment to real income. Considering only the production of 9 articles produced by domestic manufacture, for which full statistical data are available, it will be noted that between 1936 and 1948 the indices thereof rose 442 per cent.[2/] One should remember, furthermore, that during this period many large factories were built which, had they been included in the calculation of the indices, would have caused the latter to rise even further (See Table 5).

3. In all the principal cities, and especially in La Paz, there has been an extraordinary development in building and a consequent high rate of employment in this occupation. This may be deduced from the fact that even taking into account the large proportion of the building requiring only adobe and bricks, the consumption of cement between 1928 and 1948 increased from 11,386 tons to 39,539 tons, that is, 247 per cent over the 20-year period.

1/ Calculations made on estimates of the Dirección General de Estadística (General Statistical Department).

2/ An index of the value added by manufacture was calculated for cotton cloth, blankets, shawls and woollen cloth, cement, wheat flour, electricity, cigarettes, beer, sulphate of quinine, and totaquina.

Table 3 Bolivia: Per Capita Indices of the Quantum of Imports of Foodstuffs a/

1925-29=100

Years	Total imports	Total 52 articles b/	Total 41 articles c/	Basic foodstuffs d/	Foodstuffs which are not included in general consumption e/	Livestock for slaughter, & fresh and salted meat f/	Oils and fats g/
1925	93,3	100.6	100.3	103.3	111.2	47.7	120.9
1926	99.0	106.7	106.8	110.0	98.6	106.8	129.1
1927	93.3	107.7	109.8	110.7	104.1	116.2	99.3
1928	108.9	92.2	92.2	81.7	95.1	149.6	72.2
1929	105.5	92.8	91.1	94.3	91.0	79.7	78.5
1930	91.4	94.1	88.5	92.3	84.4	79.7	68.6
1931	50.7	71.6	65.4	73.6	52.6	54.7	48.2
1932	44.3	72.8	60.4	68.5	60.0	41.8	27.7
1933	63.1	68.0	55.8	71.5	30.7	6.6	23.1
1934	106.7	65.9	49.4	62.6	27.4	8.7	17.6
1935	107.2	68.9	59.9	76.2	30.4	13.4	17.3
1936	89.7	100.0	96.0	110.6	43.0	63.2	100.8
1937	85.8	122.1	112.7	116.7	46.7	153.0	134.7
1938	115.4	155.6	157.8	145.6	66.5	367.1	120.5
1939	109.5	160.2	156.0	130.6	71.7	463.2	205.2
1940	106.5	170.5	172.2	148.7	113.6	359.9	292.7
1941	139.6	264.9	269.0	193.4	186.7	563.6	722.7
1942	130.8	272.4	261.0	216.2	175.8	619.9	332.2
1943	141.0	273.1	266.6	170.2	140.8	910.4	792.7
1944	134.2	274.4	269.2	185.6	207.4	828 4	507.1
1945	115.2	237.6	228.1	181.2	182.8	509.9	449.7
1946	127.7	234.1	212.1	176.0	179.5	433.9	454.1
1947	123.7	213.3	199.8	141.2	155.6	474.6	467.8
1948	133.3	187.8	188.7	166.6	167.9	410.3	231.3
1949	139.9	182.7	162.6	141.1	169.7	260.7	341.8

Source: Basic data from Anuarios de Comercio Exterior (Foreign Trade Annuals) 1925-1949.

a/ For purposes of deflating the quantum indices of imports, use was made of the population indices based on the 1900 Census, and on the preliminary estimates of the 1950 Census, since, by 1950, the data gathered by the Statistical Service of the Bolivian Government as regards the total population of the country had a margin of error of more than 500,000 inhabitants.

b/ Includes foodstuffs and raw materials of agricultural origin.

c/ Includes only processed and non-processed foodstuffs, and livestock for slaughter.

d/ Includes wheat grain, wheat flour, rice and sugar.

e/ Includes condensed milk, butter, cheese, eggs, fresh and dried vegetables, fresh and dried fruit, preserved fruit, ground coffee and coffee beans, cacao, chocolate, tea and ají (Chili peppers).

f/ Includes cattle for meat and fresh and dried meat.

g/ Includes lard and edible oils.

Table 4 Bolivia: Five-year and Per Capita Averages of the Quantum Indices of Foodstuff Imports

1925-29=100

Years	Import totals	Total 52 articles a/	Total of 41 articles b/	Basic foodstuffs c/	Foodstuffs which are not included in general consumption d/	Livestock for slaughter & fresh and dried meat e/	Oils and fats f/
1925-29	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930-34	76.1	79.3	68.1	78.4	53.2	40.3	39.2
1935-39	117.4	138.2	132.9	131.9	58.9	243.5	132.2
1940-44	156.8	302.2	298.4	219.7	198.4	792.0	637.4
1945-49	162.6	267.5	251.7	204.3	217.0	528.8	492.3
				Per Capita			
1925-29	100.0	100.0	100.0	100.0	100.0	100.0	100.0
1930-34	71.2	74.5	63.9	73.7	51.0	38.3	37.0
1935-39	101.5	121.4	116.5	116.1	51.7	212.0	115.7
1940-44	130.4	251.1	247.6	182.8	164.9	656.4	525.5
1945-49	127.9	211.1	198.3	161.2	171.1	417.9	388.9

Source: Basic data from Anuarios de Comercio Exterior (Foreign Trade Annuals) 1925-1949.

a/ Includes foodstuffs and raw materials of agricultural origin.
b/ Includes only processed and non-processed foodstuffs and livestock for
c/ Includes wheat grain, wheat flour, rice and sugar /slaughter.
d/ Includes condensed milk, butter, cheese, eggs, fresh and dried vegetables, fresh and dried fruit, preserved fruit, ground coffee and coffee beans, cacao, chocolate, tea and ají (Chili peppers).
e/ Includes fresh and dried meat and livestock for slaughter.
f/ Includes lard and edible oils.

Table 5 Bolivia: Index of Industrial Production 1936-1948

1947 = 100

1936	21.0
1937	54.9
1938	61.3
1939	68.2
1940	67.8
1941	75.0
1942	77.8
1943	89.9
1944	91.3
1945	98.1
1946	96.4
1947	100.0
1948	109.7 a/

Notes: Basic data from the Revista Mensual (Monthly Review), April 1950, of the Dirección General de Estadística y Censos (General Statistical and Census Service).
This publication shows the gross values of industrial production; on the basis of these tables, the added value was estimated, in order to obtain a more correct weighting. For this purpose, it was necessary to calculate the proportion of the value of both domestic and imported raw materials in relation to the gross value of production for each branch of industry; this was done by the Department of La Paz, based on data contained in the Memoria Anual (Annual Report) for 1945 of the Cámara Nacional de Industrias (National Council of Industry).
The indices were calculated on the basis of production of the following 9 articles and an indication is given of the percentage of gross value which it was estimated that the added value represented: cotton cloth, 59 per cent; blankets, rugs and woollen cloth, 44 per cent; cement, 55 per cent; wheat flour, 22 per cent; electricity, 90 per cent; cigarettes, 72 per cent; beer, 66 per cent; sulphate of quinine, 39 per cent; and totaquina, 39 per cent.

a/ In 1948 the index only included 7 products, since sulphate of quinine and totaquina were omitted, owing to the lack of data relating thereto.

Together with the increase in the population's purchasing power, a marked change has been introduced in the consumption of foodstuffs. The Chaco War also played an important part in this trend. The native soldiers became accustomed to foodstuffs such as sugar, rice, bread, and, in certain cases meat, which heretofore had been entirely beyond their reach.

/At the

At the end of the war, they continued to consume these foodstuffs and to a certain extent introduced them among the rest of the rural population. However, it is not among the latter that the greatest increase in consumption took place, since the very low purchasing power of the mass of the population only enabled them to acquire such products in small quantities, making use of them as luxury goods on special occasions. The rural population is still essentially self-sufficient, producing only about 70 per cent of its own foodstuffs. The subsistence level of agriculture 1/ only barely covers the more urgent consumption requirements of foodstuffs and clothing, but does not leave a balance with which to raise the standard of living. It is likely that between 35 and 40 per cent of Bolivia's total population lives under such conditions.

The increases and the changes in the habits of consumption of foodstuffs have principally taken place among the urban population, and especially among that portion which migrated from the country to the town. Since 1934, in fact, there has been a sharp increase in imports of certain foodstuffs which in the period before the world crisis and the Chaco War were of little im portance. None, or else only very small quantities of these products are grown in Bolivia.

From a dietary point of view, the most significant increases in absolute terms were those of basic food products. Thus, taking into

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1/ It may be said that about three-fourths of the rural population in Bolivia lives on a basis of subsistence agriculture. In fact, even in cases where the "colono" or "peón" on a large estate employs 50 per cent of his time in the production of commercial crops (for the exclusive benefit of the landowner, in return, he is only entitled to cultivate a given area for himself. On the whole, a great deal of hard work is involved in the production of food on such land. Only in years of good crops is it possible for them to dispose of a small surplus production which is sold or traded to obtain other foodstuffs, clothing, tools or work stock.

account only the consumption of imported goods and excluding the consumption of similar products of domestic origin, per capita wheat consumption rose from 12.7 kilogrammes during 1925-1929, to 21.2 kilogrammes during the five-year period 1945-1949. During the same interval, the consumption of imported sugar [1] increased from 5.4 kilogrammes per capita to 9.3 kilogrammes, whilst that of rice rose from 1.8 to 2.6 kilogrammes; per capita consumption of preserved milk increased from 200 to 720 grammes, and of lard from 130 to 590 grammes. Imports of beef (live cattle in terms of fresh beef plus fresh meat imported as such and dried meat) increased from 380 to 1,600 grammes per inhabitant. Per capita import indices of the foodstuffs shown in the table point more clearly to the increasing trend of consumption.[2] There was also an appreciable expansion in per capita imports of hogs and sheep for slaughter and of butter, tea and fruit, but the relative importance of these, in relation to total foodstuff imports, was very small.

So rapid an expansion of foodstuff imports, made up of goods which are only produced on a small scale in the country, seems to confirm the belief that it is a question of an increase of consumption rather than a decrease of agricultural and livestock production. Constant efforts are being made to increase production of these goods, and at least in one concrete example, namely wheat, positive results have been obtained. There is good reason to believe, moreover, that the production of rice and milk also expanded substantially.

At the same time, it is possible that the increase in the consumption of basic foodstuffs may have been made at the expense of displacing other foodstuffs of domestic origin. Official estimates and information which was privately gathered regarding the production of these goods, [3] lead one to assume that this did not occur, since consumption appears to have expanded at more or less the same rate as the population.

1/ It may be assumed that the volume of sugar imported represents total consumption, since domestic production does not constitute 5 per cent of imports and until 1948, was only consumed by a very limited sector of the country's population.

2/ In order to calculate per capita consumption, the population data was corrected according to the 1900 Census and the preliminary estimates of the 1950 Census.

3/ Potatoes, coffee, barley, cacao, maize, quinua, fresh vegetables and fruits, broad beans, etc.

/Table 6

Table 6 Bolivia: Per Capita Import Indices of Selected Products 1925-1949

1925-29 = 100

Years	Refined and brown sugar	Wheat, wheat flour & "mote" in terms of wheat grain	Rice	Cattle, fresh meat and dried meat	Lard	Edible Oils
1925	101.2	104.0	107.2	54.1	123.0	119.5
1926	86.8	116.7	133.0	81.4	132.4	120.3
1927	97.6	117.4	101.0	119.8	114.0	73.2
1928	108.1	73.0	67.2	155.6	60.0	96.4
1929	106.3	89.8	92.6	89.1	70.6	90.6
1930	109.5	85.6	93.0	77.1	54.4	94.0
1931	103.3	66.4	53.3	42.0	25.9	87.6
1932	76.8	72.4	44.5	33.3	11.9	55.8
1933	89.4	76.7	19.9	5.8	5.4	54.4
1934	105.6	52.5	29.8	9.1	5.7	38.8
1935	109.7	73.1	36.2	11.6	2.8	43.3
1936	146.1	103.1	106.5	82.9	101.8	98.9
1937	143.0	110.4	129.2	173.4	159.1	91.2
1938	158.2	139.2	207.8	496.8	103.0	151.4
1939	177.2	121.6	109.0	610.7	263.6	101.4
1940	188.1	134.0	208.4	471.2	354.3	183.0
1941	239.8	169.4	218.7	732.4	968.2	286.1
1942	253.7	221.9	191.2	867.6	417.3	181.1
1943	155.8	202.3	68.1	1,243.6	1,092.5	259.5
1944	208.8	189.5	194.9	776.0	648.7	255.1
1945	199.4	187.2	184.8	582.9	612.7	159.9
1946	166.0	185.4	190.4	579.4	489.2	391.3
1947	111.0	170.3	71.2	635.3	530.4	356.5
1948	196.3	163.2	148.7	554.0	243.7	209.1
1949	190.5	140.1	114.9	346.6	425.2	194.3

Source: Anuarios de Comercio Exterior (Foreign Trade Annuals) 1925-1949

Imports of fibre, cotton and wool developed rapidly after 1929, due to the introduction and expansion of a textile industry into Bolivia. The trend of these imports does not throw much light on domestic production cotton, thus far, having only been grown for experimental purposes and domestic wool sold to the factories,(in competition with the imported article)does not indicate the volume of total production, since a great deal of it is processed by the principal producers, namely the Indians, and ahother part is sent as a contraband to Peru, where it fetches higher prices.

/The value of

The value of imports of mules, horses and asses stands out in the total, there being little breeding in the country; throughout the years this occupation has never achieved much importance.

In conclusion, judging from the trend of imports, it may be said, agricultural production expanded at slower rate than the population, or at best commensurately with it, at least until the middle of the forties.

The following comments show that apart from the changes brought about by climatic conditions, the foregoing conclusions, and specially the first one are close to reality.

1. With the exception of isolated cases which have no great bearing on the total, agriculture has maintained its secular structure and there have been few important changes in production.
2. Technical improvements and the small-scale introduction of mechanisation seem mainly to have offset the growing difficulties brought about by a withdrawing of part of the population from some of the rural areas, and by the social turmoil among peasants.
3. The native population still pursues subsistence level agriculture, only a small part of its production reaching the domestic markets.
4. The cultivated area in the country does not seem to have varied much. On the high plateau, there have been no increases; on the contrary, it is probable that there has been a reduction of the cultivated area, partly as a result of social difficulties.

In the valleys, road building has enabled small regions which were formerly isolated to be incorporated into the national economy. On the other hand, the excessive break-up of properties has reduced the efficiency of production. Erosion has caused considerable damage, especially in the valleys of the south (Tarija).

In the Santa Cruz region, the cultivated area has been increased. Mechanisation in this area was a determining factor in facilitating the incorporation of new land and in substantially increasing the volume of rice, sugar-cane, maize and oil seed production. It may in truth be said that the greatest agricultural progress of recent years was recorded in this region.

5. Agricultural yields have deteriorated owing to the progressive exhaustion of the soils and to the degeneration of seeds, as well as to the increasing attack of pests and diseases.

Only during the past six years has a well organised programme been undertaken in which new varieties of seeds are being imported and developed locally and improved techniques are being applied to cultivation. The results of these improvements have not yet influenced overall production.

Development of certain specific crops

Though total agricultural production seems to have expanded to a lesser extent than the population, certain changes have taken place within it, affecting the rate of production of certain crops, which it would be advisable to consider separately.

The Government has been increasingly concerned with developing the cultivation of basic foodstuffs, especially those which must be imported. The methods used to develop production, however, have not been very successful and therefore the results are not very encouraging.

Wheat. This cereal is one of the basic elements of Bolivian diet, being the principal source of calories for the urban population; it is therefore necessary to import large wheat supplies each year in order to cover the gap left by the limited domestic production. Consequently the Government has given preferential attention to the expansion of wheat cultivation.

The first measures taken with this object in view were adopted in 1918. No results were obtained, however, since the Government did not have the means with which to put them into practice. Until 1929, the greater part of consumption of this cereal was supplied by flour imports. The milling industry was in its primary stages and the greater part of Bolivia's low wheat production was ground in many stone mills located in or near the area of cultivation. In 1929, by means of government legislation, the Junta Nacional de Agricultura (Nation Agricultural Board) was created principally for the purpose of fomenting wheat production. The plan adopted consisted in taxing wheat flour and wheat imports on a progressive scale, with a view to prohibiting such imports after a reasonable period, and also in order to aid domestic milling industries in their development. The sole measure specifically intended to increase wheat cultivation was that of providing for "the continuation of imports of foreign seeds to be distributed to farmers".

The only result of this law was the rapid expansion of the flour milling industry, since domestic wheat production remained stationary. Competition of imported wheat together with the demands made by the millers regarding both quality and price, checked the anticipated

/increment

increment. However, a radical change did take place in the composition of wheat and flour imports. Whilst wheat imports increased tremendously, imports of flour decreased proportionately. (See Table 7 and Chart 2).

In view of the failure of earlier legislation, the Government created the Junta de Fomento Triguero (Wheat Development Board) in 1936, for the purpose of increasing the production of wheat. No immediate results were obtained, but this Board engaged the services of a mission of Mexican technicians, who began studying the problem of irrigation and carried out the first irrigation system in Bolivia.

Later, the "Comité de Fomento Agrícola y Regadío" (Agricultural Development and Irrigation Committee) was established and was granted special funds to carry on its work. Together with the Ministry of Agriculture, of which it was a part, this committee began a more constructive task and gave more direct aid to farmers, offering them technical advice, low priced seeds and, moreover, it hired out agricultural machinery for their work.

As an additional measure to stimulate the cultivation of wheat, in 1941 the government decreed the grading and fixed support prices for the purchase of domestic grown wheat granting a bonus of 45 per cent on the prices quoted that year. The following year, the price was readjusted to 120 bolivianos per 46 kilogramme quintal, instead of 128.25 bolivianos.

As a result of these measures, farmers showed some enthusiasm for wheat cultivation. Production during these years seems to have increased slightly, though this did not have any repercussion on demand as imports continued to increase at a high rate.

/Table 7

CHART 2

BOLIVIA

IMPORTS OF WHEAT GRAIN, FLOUR AND TOTAL OF WHEAT GRAIN AND FLOUR

PURCHASES OF HOME-GROWN WHEAT BY FLOURS MILLS

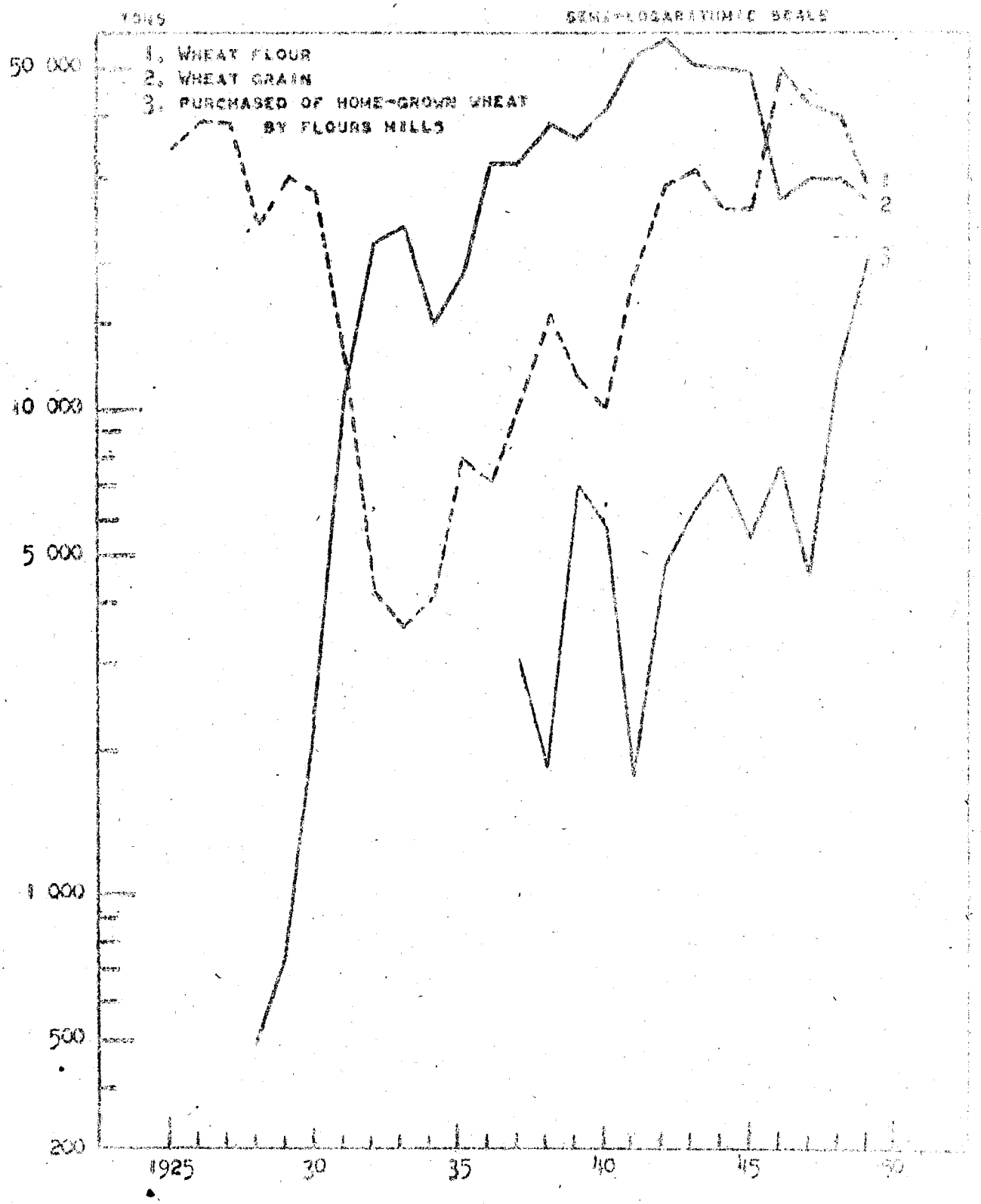

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Table 7. Bolivia : Imports of Wheat, Wheat and Flour and Whole Wheat, in Terms of Wheat, and Wheat Purchases for the Milling Industries

(Tons)

Years	Imports of wheat grain	Imports of wheat flour (In terms of grain) a/	Imports of "mote" (In terms of grain) b/	Purchase of domestic wheat by the milling industries
1925	239	33,717	..	..
1926	25	38.638	..	..
1927	7	39,377	..	..
1928	492	24.330	..	..
1929	737	30.238	..	..
1930	2,323	27,537	..	..
1931	10,476	13,000	..	..
1932	22,011	4,242	..	..
1933	24,254	3,562	..	..
1934	15,185	4,097	..	..
1935	19,275	7,904	..	..
1936	31,660	7,107	15	..
1937	31,659	10,360	..	3,053
1938	39,209	15,585	..	1,858
1939	36,018	11,357	..	7,126
1940	42,067	10,031	738	5,813
1941	52,692	19,262	2,603	1,783
1942	57,994	28,862	2,653	4,798
1943	50,880	30,872	804	6,203
1944	50,386	25,508	2,261	7,520
1945	50,186	25,871	1,951	5,531
1946	27,131	49,958	1.030	7,696
1947	29,917	42,181	496	4,550
1948	30,231	39,624	388	12,100
1949	26.945	29,368	202	20,657

Source: Anuario de Comercio Exterior de Bolivia (Foreign Trade Annuals) and statistics published by the Millers Association of Bolivia.

a/ 70 per cent extraction
b/ 85 per cent extraction

/There was

There was no great change in production, despite the adoption of these measures, the only fluctuations which occurred being accounted for by climatic factors. The price fixed did not offer the producer sufficient incentive since in the valley region the cultivation of maize yielded greater profits and was a safe and hardier crop. In the high plateau, the small amount produced was concentrated in the vicinity of Lake Titicaca, and involved considerable risk due to frost hazard. Potatoes, barley and quinua were far more advantageous than wheat. However, nowhere had any serious experimental work been carried out in order to find out which were the best adapted varieties for each region.

In 1946, in view of the considerable rise of prices on the world market, the Bolivian Government fixed wheat prices, at levels similar to those of the world market (220 bolivianos per 100 pound quintal) leaving the way clear for the subsequent annual adjustment of prices. In 1947, the price was increased to 335 bolivianos.1/

At the same time organised experimental work was begun both in the valleys and in the high plateau area; the acclimatization of several foreign varieties was carried out together with the breeding of others, in order to obtain well adapted varieties for the diverse ecological conditions of the various wheat growing regions in the country.2/

All these development measures were of great value since in the course of the crop year 1946-47, there was a slight increase in the total cultivated area though harvests were not very encouraging due to poor climatic conditions, and a serious attack of rust in the Cochabamba Valley.

High prices brought about winter wheat cultivation in the irrigated area of the La Angostura Dam, with excellent results.

In the crop year 1947-1948, a greater relative price increase of wheat,

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1/ By Supreme Decree C2024, of May 11, 1950, the price of wheat was again raised to 450 bolivianos per 46 kilogramme quintal.

2/ The "Servicio Cooperativo de Estaciones Experimentales" (Co-operative Service of Experimental Stations) in which both the Ministry of Agriculture and the Office of Foreign Agricultural Relations of the Department of Agriculture of the United States co-operated, have continued the work begun by the Ministry of Agriculture at the Tamborada and Belén stations, and have extended this work considerably.

/as compared

as compared with other cereals included in the price support decrees enacted, led to a slight increase of the cultivated area, displacing other products, especially maize and barley. As a result of this expansion, and principally because of good climatic conditions wheat production reached the highest level up to that year - 24,000 tons according to estimates made by the "Dirección General de Economía Rural" (General Board of Rural Economy).

During the year 1948-1949, a marked change took place in the structure of agriculture of the valleys, when as a result of the high prices paid for wheat and the fall of maize prices, there was an extraordinary stocking substitution of the latter by the former.

That year's harvest reached an unprecedented total. The millers purchased 20.657 tons of domestic wheat, an increase of 70 per cent over the preceding year, and of 267 per cent above their 1946 purchases.

These increases in production may be principally attributed to the increase in the cultivated area and to the good climatic conditions which prevailed during the last few years. The results obtained from the work on the experimental stations and the improved technique of wheat cultivation, however, have not yet been sufficiently publicized to influence the yield to any great extent. On the other hand, mechanization has facilitated wheat cultivation and harvesting considerably, especially in the central valleys of Cochabamba.

The increase of wheat production, at prices supported by the Government, has meant a considerable saving in foreign exchange for Bolivia; at the same time, however, it has created difficulties for the State in the latter's efforts to maintain the price of bread at levels within the reach of consumers. The higher price of national wheat, as compared with the imported product, compelled the State to pay the millers a sum which, in 1948, amounted to 25,792,000 bolivianos, that is, to about 30 per cent of the total value of the wheat; in 1949, the amount involved was even greater. This subsidy was obtained from the revenue[1/] derived from imports and other foodstuffs and was paid with a

1/ Profits obtained by the State from the importation of other foodstuffs.

view to avoiding the disproportionate rise of the price of flour and its by-products (all types of bran) used in the concentrated feeding of dairy cattle).

Undoubtedly, if the policy of price supports is not coupled with a vigorous campaign for the introduction of technical methods of cultivation, and the improvement of yields (and therefore the reduction of production costs) the efforts thus far made will not have lasting results, since any reduction of price would involve a corresponding reduction in the cultivated area. It is necessary to emphasize that so far, the cultivation of wheat was fortuitous. The cultivating of imported varieties, the vegetative cycle of which is too long for the majority of Bolivia's so-called wheat growing regions, and their susceptibility of rust attacks, have resulted in annual losses of large areas on which wheat has been sown, or alternatively in the lowering of the yield. The lack of phosphates in the greater proportion of Bolivian soils and the fact that no fertilizers are used combine to limit yields.

Maize. In Bolivian agriculture, maize occupies the greater proportion of the total cultivated area. According to estimates made by that country's Ministry of Agriculture during the crop year 1948-49, it was planted on 117,000 hectares, that is about twice the area sown with potatoes (its nearest competitor), namely 62,000 hectares. However, both the value and the volume of maize production seem to be well below that of this root crop.

Maize is of outstanding importance because it is a basic element in the diet of the mass of Bolivia's rural population and because of its use as the principal raw material in the manufacture of alcoholic beverages (alcohol and "chicha"). Its use in cattle feeding is very limited, being reserved almost exclusively for poultry. Its cultivation extends from the valleys of the high plateau to the tropical and semi-tropical plains in the East. It is most highly concentrated in the central valleys of Cochabamba and Chuquisaca (Province of Azero).

Until the end of the 1920's, production seemed to have remained fairly stable, since transport difficulties and the relatively low value of the product hinder its transport to regions far from the producing area. During the 1930's, with the mechanization of transport, markets

/were to a

were to a certain extent widened and demand for maize increased, principally with a view to the manufacture of alcohol and flour.[1/] Since the middle of the 1940's, production seems to have remained stable and the cultivated area seems to have decreased. Recently, with the opening of the Cochabamba-Santa Cruz road, a part of production seems to have been displaced from the Cochabamba Valley to more distant zones where land is cheaper and the cost of production lower. Wheat, alfalfa, potatoes, and later linseed seem to have displaced maize.

It should be made clear that lack of irrigation, and variations in climatic conditions considerably influence the volume of production and prices. Given that demand for this product is very stable on the domestic market, and that there are few possibilities of exporting maize, any change in the volume of the harvests is sharply reflected on the price level. Since the influence of price is basic in determining the extent of cultivation, it is evident that when prices are low, a reduction in the cultivated area follows, and vice-versa, that is, the area increases when prices are high.

The area planted with maize during the period 1945-1949 appears to have been greater than that cultivated in 1925-1929, but smaller than in 1940-1944. Average production seems to have increased at a lower rate than the increase in the area sown, due to the fact that in its expansion, maize cultivation was extended to areas where the yield was lower, and where labour productivity, as a result of the exclusive use of manual methods of cultivation was very low.

Apart from the limited utilization of machinery in the preparation of the soil and in the shelling, no technical improvements have been made in maize cultivation. Unimproved native varieties are still being used. The few experiments made with hybrid maize have hardly affected cultivation as a whole.

Potatoes. Potato production seems to have increased in a measure with the growth of the population, imports, save in exceptional years, having remained at a low level. During the last few years, however, greater

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1/ Between 1936 and 1943, production of alcohol increased more than 200 per cent; most of the raw material consumed for this in increment was maize. However, during 1943, the whole industry barely consumed about 4,500 tons, which constitutes only a small fraction of total maize production.

difficulties have been encountered in its cultivation due both to social turmoil in the rural population of the high plateaus and in the valleys, and to attacks of pests and diseases, which are relatively new to Bolivian agriculture.[1/]

Potatoes are the most important crop in the country both because of the volume and the value of its production. Together with maize it constitutes the basic diet of the population, though the former is consumed to a greater extent by the urban population. Potatoes dried by natural processes (exposure to frost and sun) are very popular and facilitate consumption over long periods (chuño and tunta).

The same as with the majority of other crops, the production of this tuber was not affected by modern technique. Mechanization was largely used in the preparation of the soil; sowing, cultivation and harvesting are almost entirely done by manual methods, using primitive tools and the Egyptian plough.

The experiments made to develop, select and introduce new varieties have only been carried out on a very small scale. The results have not yet been adopted by the producers.

Rice. Until the beginning of the 'forties, there had been no expansion in this cultivation which was practically concentrated in a few isolated regions in in the country, where production was merely carried out in order to supply local markets.

After the beginning of the Second World War, the price of rice rose sharply and imports became scarce because of the interruption of trade with both Europe and the Far East. It was therefore necessary to have recourse to South American markets for supplies, where prices were much higher and stocks were limited. These events improved the competitive position of the domestic product to such an extent that the farmers of the Santa Cruz region began to plant more rice. A similar reaction took place in various regions of warm climate in Bolivia which, on the whole, are isolated and have difficulty in obtaining supplies from abroad.

1/ Phitopthora Infectans in the valleys and the "gorgojo" or potato worm (Premnotrypes sp.) on the high plateau. Damage by fungi such as Spongospora and Rhizoctomia is widespread.

/Since 1945,

Since 1945, the Corporación Boliviana de Fomento (Bolivian Development Corporation) contributed to the expansion of production with the Chané project, in which 130 hectares[1] were cultivated; in 1948 about 150 tons were produced and only 60 tons in 1949. Increased utilization of agricultural machinery by the Santa Cruz area favoured the cultivation of rice, lowering its costs of production and facilitating its transportation to large consumer markets at Cochabamba and Sucre, etc. despite high transport rates.

The introduction of several Brazilian varieties increased the yield, but there is still much room for new improvements. The Servicio Cooperativo de Estaciones Experimentales (Cooperative Service of Experimental Stations) has started investigations in the cultivation of rice on the station at Naranjal.

Sugar-cane. The cultivation of sugar-cane, like that of rice, is principally centred around Santa Cruz, but there are relatively small plantations in other warm regions of the country.

Production seems to have developed slowly and for the most part has been used in the manufacture of alcohol, since it thus yields higher profits than in the manufacture of sugar. Moreover, because of its higher unitary value alcohol can be placed on the larger markets in the country. The production of sugar itself is very small and is limited to covering local requirements.

Since the late thirties the rate of expansion of sugar-cane was furthered by greater mechanization with a view to the manufacture of alcohol over the short period and over the long period, for the purpose of undertaking large scale sugar production.

The Bolivian Development Corporation in 1945 planned a substantial capital investment for the establishment of a 5,000 ton capacity sugar mill, and preparatory work was started on the project. This includes the introduction of new varieties of cane, the clearing of land, buildings, etc. Lack of funds interrupted the programme of which only the initial phases had been completed.

On the other hand, relying only on the assistance of the Agricultural Bank, a small mill (La Esperanza) was slowly begun in 1944. In 1946, this

1/ Memoria of the Bolivian Development Corporation, May 1947, August 1948, La Paz, page 45.

/plant produced

plant produced 122 tons of semi-refined sugar. With a loan of 460,000 dollars and 800,000 bolivianos, loaned by the Bolivian Development Corporation, the extension of this plant was undertaken with a view to its being in full operation by the time the 1950 crop was harvested, when it was expected to have an output of 1,500 tons. The area of their sugar-cane plantations has expanded at a high rate.[1/]

The building of the paved road from Cochabamba to Santa Cruz has coincided with increased interest in the development of large scale sugar plantations. Various companies have been founded with national and foreign capital; they have bought up the land, and gradually begun to plant sugar, to a certain extent, on an experimental basis, with a view to developing production in the future.

Barley. The production of barley seems to have developed very little, despite its increased consumption in brewing beer and manufacture of alcohol. Judging from the scarce data available, the quantity of domestic barley used as a raw material in industry doubled between 1940 and 1947, when 2,400 tons[2/] and 5,050 tons[3/] were consumed, respectively. This amount is equivalent to only about 13 per cent of the total production estimated for 1949 by the Dirección General de Economía Rural (Department of Rural Economy). Industry has consumed increasing amounts, but the consumption of barley, as a foodstuff for the population, has decreased. The rural population of the high plateau has been replacing this product by other foodstuffs.

Since 1946, owing to the fact that the price guarantee for this cereal increased to a lesser extent than that for other similar products, there seems to have been a slight contraction in the area sown. However, good climatic conditions during the past few years have resulted in an appreciable increase of production.

Other crops. The majority of other crops are only of local importance and few statistics are available with which to study their development during the period under observation. The cultivation of oil seeds in the

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1/ In 1950, these sugar-cane plantations spread over about 450 hectares, but the mill also bought up additional sugar-cane from neighbouring properties.

2/ Industria Fabril y Manufacturera, 1940, General Statistical Department of the Bolivian Ministry of Finance, La Paz.

3/ Statistics of raw material used by domestic industry, 1947, Dirección General de Economía Rural.

valleys, and on the eastern plains in developing significantly. In these valleys, and especially in the valley of Cochabamba, successful results have been obtained with linseed crops. On the eastern plains, sunflowers and peanuts appear to offer good prospects.

The cultivation of quinua has been extended on the high plateau as a result of price supports for the product and its use has already been introduced in baking bread.

The commercial cultivation of cotton is still in an experimental stage, though it appears that there are possibilities of a large scale expansion within the near future.

Livestock production

Bolivian cattle breeding seems to have been even more ill-starred than agriculture, the number of heads on the whole having decreased considerably. Cattle. With the exception of the eastern and southern regions, there are not in Bolivia any specialized cattle raising regions, though to varying degrees, cattle is raised everywhere in the country for a dual purpose. First, they are used as draught animals and after a few years, when they have grown in size and weight, they are slaughtered to supply meat for consumption.

Under the conditions which prevailed during the greater part of the last quarter century, when the cattle in the eastern area could not reach the main centres of consumption, the country's cattle raising capacity was very limited and appeared to show a decreasing tendency, as a result of the expansion of the cultivated area, and a corresponding reduction of natural pasture fields. On the other hand, meat consumption has increased remarkably, and presumably demand could not entirely be met by increasing imports ; the gap has therefore been covered by domestic cattle production. The slaughtering of breeding cattle reached its highest point during, and immediately after, the Chaco War[1/] and it has never been possible to replace it. The drought which began in 1941 in the high plateau area, and which lasted for four years, reduced the cattle stocks of this region. Later, foot-and-mouth disease broke out among the herds in the district and in the valleys, causing serious losses.

The fact that cattle imports increased by 190 per cent between 1938

1/ Presidential Message to Congree by President Peñaranda, 1943, page 220.

/and 1948,

and 1948, whilst consumption rose 54 per cent,[1] shows clearly that the contribution of domestic cattle production to domestic consumption is decreasing progressively.

Since 1946, domestic beef consumption on the high plateau markets has been increasingly supplied by the cattle of eastern Bolivia. This region until recently was completely isolated from the principal centres of consumption but with air transportation it has now become one of its principal sources of supply.

Up to 1945 cattle in the plains of Beni were practically wild and only occasionally did man intervene in its management. Sometimes a few heads were led to the western markets, but the losses over the long and [illegible] tracks were great. They were also frequently taken to centres far away from the cattle area, in the eastern zone itself, especially Santa Cruz, Riberalta and Cobija, and exported to the villages along Bolivia's frontier with Brazil, though this involved also substantial losses. These limited markets, the difficulties in transport and the very [illegible] prices obtained were not sufficient inducement to improve breeding conditions. Moreover, endemic diseases, periodical floods and the poor quality of the prairie grasses brought about a sort of balance between the habitat for the cattle and cattle production itself.

In 1946, the Ministry of Agriculture and the Bolivian Development Corporation studied the possibility of opening the large markets of the high plateau to cattle production from the Beni region. In a short time an air transport company was organized and successfully initiated meat shipments from Beni. A cold storage warehouse was built and the link between the two regions was definitely established. The slaughter of cattle increased and the good commercial prospects in this branch have lately induced new-formed companies to make use of the abundant cattle stocks of Beni.

The rapid growth of cattle slaughter has not been followed by a corresponding increase and improvement of breeding methods. Only in some isolated cases have measures been taken to develop the rationalization

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1/ In 1938, in the capitals of the nine Departments, 52,811 heads of bovine cattle were slaughtered, this number having increased to 81,587 by 1948. (The data lacking for certain Departments have been interpolated). Source: Central Bank Bulletin number 86, October, November and December 1949.

of cattle breeding, but on the whole the only progress made has been in dealing with the health of the adult and the younger cattle. Consequently there has been a slight shortage of oxen ready for the market and occasionally breeding animals have been slaughtered. The increase of demand has caused prices to rise more than 500 per cent between 1946 and 1949.

Despite the fact that the cattle population in the area is large (704,967 heads in 1946)[1/], the percentage of animals which may be ready for the market is very low. It is therefore not possible to draw on these herds to an unlimited extent, without considering immediate replacement requirements. Under present conditions, the fertility of the cattle is low and the calf mortality rate very high.[2/] Moreover, the poor quality of the cattle, the low feed value of the pastures, and the contaminated waters hinder normal growth of cattle. Cattle do not reach full maturity before five years. These factors result in a low replacement rate, and limit to a minimum its rational utilization.

Little has been done in the country to improve the quality of beef cattle. The only measures worth mentioning are the introduction of the zebu cattle in the herds of the east, and the extension of a sanitary campaign carried out by the Ministry of Agriculture through the Instituto Oriental de Biología (Eastern Biological Institute) and the regional cattle offices.

Dairy Cattle. Until about the middle of the 'thirties, dairy production remained static, and like the rest of agriculture, only a few odd examples of progress were observed. After the Chaco War, demand for dairy products increased greatly. The production of fresh milk was very limited, so that increasing amounts of condensed milk had to be imported.[3/]

As a result of this extraordinary increase in demand, dairy production developed slowly, especially in the vicinity of La Paz and Cochabamba. This was made possible by importing improved dairy cattle, principally from Argentina.

1/ Data supplied by the cattle census, carried out by the Bolivian Development Corporation. There are reasons to believe that this census did not include all the herds, since many cattlemen ignore the exact number of their herds. It is therefore possible that the real number is even higher than that mentioned by the census.

2/ Between 40 and 50 per cent of the calves born, according to statements made by cattlemen in this area.

3/ 2,479 tons in 1948, as compared with 564 tons in 1925.

/These imports

These imports increased after 1940, as a result of founding of the Agricultural Bank, and thanks to its wholehearted cooperation in the establishment of dairies. The area on which alfalfa was cultivated increased correspondingly. However, all these efforts were inadequate to meet growing demand; consequently imports of evaporated milk continued to increase. Despite this progress, there is very little dairy cattle in Bolivia - certainly not more than a total of 5,000 heads.

Sheep

Sheep breeding is of considerable importance in the high plateau area and is principally concentrated thereabouts.

By the beginning of the last quarter century, the natural meadows of the region were overloaded and overgrazed by decadent flocks of sheep, with very low yields in wool and meat (1/2 to 1 1/2 lbs. of poor quality wool and 10 to 15 lbs. of meat on the average). The low rate of reproduction - about 50 per cent[1/] - together with the limitations of the pasture itself, absolutely checked the expansion of the herds.

About the middle of the 'thirties, some breeders began improving their flocks by introducing pure-bred or improved rams, Merino, Corriedale and Romney Marsh, obtaining quite successful results. This improvement, however, though it has been further developed during the past ten years, is still too slight to show any progress in the total yield.

Between 1941 and 1944, the long drought which caused so much damage on the high plateau, also brought death to whole flocks of sheep. According to some estimates; over 200,000 heads were lost and these have not yet been entirely replaced.

No effort has yet been made to improve the pastures in this region and very little has been done in the way of sanitation. Luckily, they are affected by few endemic diseases and even fewer epidemics.

The statistics of the wool purchases by the Agricultural Bank for sale to the textile factories do not indicate the trend of production since a good deal is used by the cattle breeders themselves and apparently large quantities are also sent across the Peruvian border as contraband.

Hogs.

The total number of hogs seems to have increased very little despite the fact that they are essentially bred in the farmyards. Their price has

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1/ H.G. Dion, Agriculture in the Altiplano of Bolivia, Food and Agricultural Organization, Washington 1949, page 22.

/increased

increased to a much greater extent than that of ovine or bovine cattle, but there has not been a corresponding increase in the number bred.

The cholera epidemic which has affected various regions of the country since 1946 caused great damage among these animals; very often, this disease killed off whole herds in a few days.

CHAPTER II THE STAGNATION OF AGRICULTURAL DEVELOPMENT AND ITS CAUSES

The factors which have retarded and continue to hamper Bolivia's agricultural development will now be considered. In order to understand them better, it is necessary to pause and examine the principal agricultural zones.

Agricultural Zones

Owing to the differences of altitude there is a diversity of climates and soils which might well facilitate efficient production of the foodstuffs and raw materials required for domestic consumption.

The table lands of the Altiplano are suitable for the cultivation of cereals and for the breeding of sheep. The temperate conditions prevailing in the valleys of the mountain range are ideal for the production of fruit, vegetables and cereals. Lastly, there are vast areas in the eastern plains suitable for the growing of semi-tropical and tropical crops and for large-scale cattle breeding. These regions differ radically from one another as regards climate, soil, topography. system of land tenure, systems of labour, population etc., and therefore the problems hampering their individual development are likewise very different.

The High Plateau Area

The High Plateau is in the West of Bolivia, between the two mountain ranges which traverse the country from north to south, in the Departments of La Paz, Oruro and Potosi. It covers an area of about 15.3 million hectares, of which it is estimated that only about 33,000[1/] are being cultivated.[2/]

1/ H.Y. Dion: Agriculture in the Altiplano of Bolivia (Food and Agriculture Organization, August 1949.)

2/ The total arable area in this region is not known, but it is certainly more than 2,000,000 hectares. Those flat lands where climatic and soil conditions hinder cultivation, have not been included in this total.

/The average

The average altitude of this region is about 3,800 metres above sea level. Average temperatures are relatively low (18° C) and the rigours of the climate are increased by the sharp variations between day and night temperatures. During the winter, the thermometer falls to 10° C and 15° C below zero, especially in the southern area, and even in the summer, frost frequently damages the crops. These violent changes do not occur to the same extent in the regions near Lakes Titicaca and Poopoo where the influence of these bodies of water greatly favours agriculture.

Non-irrigated agriculture is possible, because there is a rainy season, which coincides with the vegetative cycle of plant life. It should be noted that this rainy season is remarkably different from the dry winter months.

The rainfall decreases sharply towards the south. In the northern area, influenced directly by Lake Titicaca, the annual average rainfall amounts to about 500 millimetres, whereas in Uyuni, in the extreme south, the average is only about 177 millimetres.

Rainfall distribution is irregular and in some years there are periods of copious rainfall alternating with dangerously long periods of drought.

On the whole, the soil is poor, especially as regards its phosphorous and nitrogen content. There is little organic matter in the greater part of arable land, so that even small amounts of manure improve the harvests considerably. The absence of phosphorous may be inferred at a glance from the fact that the cattle are accustomed to chewing bones, pointing to the lack of phosphorous in the pastures and therefore in the soil. This condition dangerously retards the development of plants, exposing them to autumn frost.

The other soil components exist in fairly normal quantities.

Erosion has had much to do with the impoverishment of the soil. Surface erosion is common throughout the Altiplano and furrow erosion is also leading to serious problems in many areas. There is also constant danger of wind erosion during the windy, dry months of July, August and September.

Thus, from the physical point of view, there are numerous factors which limit agricultural production on the High Plateau and which may be briefly summarized as follows:

/1) Marked deficiency

1) Marked deficiency of nitrogen and phosphorous in the soil.
2) Inadequate distribution of rainfall.
3) Frequent sharp falls in temperature (frosts) during the vegetative cycle.
4) Occasional hailstorms.
5) Erosion.

This combination of factors make agriculture in this area relatively poor, though it could be substantially improved. Under present conditions a large part of the area under cultivation might be considered as marginal, in view of the low average yield obtained.

In this region, the following crops are grown, listed in accordance with the area of land on which they are cultivated:

Region influenced by Lakes Titicaca and Poopoo	Rest of the High Plateau
Potatoes	Forage barley
Forage barley	Grain barley
Grain barley	Quinua 1/
Quinua 1/	Potatoes
Beans	Cañagua 1/
Wheat	Ocas 2/
Cañagua 1/	
Alfalfa	
Ocas 2/	

Agricultural products, on the whole, are of only fair to poor quality, since varieties of all the crops cultivated are ill-suited to the region or have degenerated owing to the lack of seed selection and the impoverishment of the soil.

It is not even possible to make a rough estimate of the volume of agricultural production in the High Plateau area, but it is known that it supplies at least 80 per cent of the food of the indigenous producers and the surplus, especially of potatoes and their by-products (chuñua and tunta) meets a substantial part of demand from principal consumer centres such as La Paz, Oruro and some of the large mining establishments.

1/ Edible grains of high protein and vitamin content. Quinua is consumed more or less like rice and cañagua is consumed in the form of toasted flour.

2/ An edible root crop.

Stock breeding on the High Plateau is of a fairly low grade with the exception of the auchenidos, (llamas, huanacos and alpacas), that is native animals and therefore accustomed to the surroundings.

Sheep predominate, followed by cattle, hogs and donkeys. The animals are small and thin, their yield being extremely low whether in meat, wool, milk or butter. The impoverishment of the soil and the consequent shortage of pasture, together with the fact that breeding is unregulated, have caused the present degenerate state of the animals. This does not mean, however, that the High Plateau is not suited for stock breeding; on the contrary, it could be the most lucrative occupation in the greater part of this area, as has already been shown in various isolated spots by careful management and utilization of the pasture land. These few spots have been used too often and the various species of good natural grasses in the area have been gradually exhausted. Thus, where two hectares of natural pasture per head of sheep per annum should be the normal distribution, as many as 4 and 6 heads per hectare per annum are being pastured. Under these conditions it is not surprising that the average weight of an adult sheep is about 23 kilogrammes and that the annual yield of wool is about 500 grammes, with not more than 45 to 50 per cent of births among the ewes. The poor quality of the sheep stands out more clearly when compared with other countries. In Uruguay for instance, the average weight of an adult sheep is about 40 kilogrammes, yielding about 2 1/2 to 3 kilogrammes of wool, with a birth rate of 80 to 90 per cent of the number of ewes.

Despite current agricultural and stock breeding conditions on the High Plateau, this is one of the most densely populated areas in the country, especially the regions of Lake Titicaca and Lake Poopoo where the system of land tenure has become a very serious problem. In the southern part of the country, where agricultural possibilities are poorest, the population is not very dense and many landholders complain of a labour shortage.

The Region of the Valleys

There is little continuity of climate in this region in contrast with prevailing conditions on the High Plateau or the eastern plains. It is made up of a number of different sized valleys located near the spurs of the Andes Range, at the foot of high mountains or on their slopes. This mountainous area is about one quarter of the country's total

/area and

area and includes a part of the Departments of La Paz, Potosi, Santa Cruz and Tarija, as well as practically all of Cochabamba and Chuquicaca. However, only about 3 per cent to 5 per cent of this area is under cultivation at present.

The climate in these valleys fluctuates (according to the altitude and geographic location) between a temperate regime with low rainfall and a tropical regime of high temperatures and more than 4 metres of rainfall. The largest proportion of arable land and the most intensively cultivated area are located in the temperate area with average annual temperatures fluctuating between 12° C and 18° C and a rainfall average of 600 to 1,200 millimetres.

The agricultural methods vary according to the topography of the area under cultivation. There are large flat surfaces where mechanization could be introduced (the central valleys of Cochabamba, the Valle Grande in Santa Cruz etc.), where draught animals are at present being used for agricultural purposes. In the mountainous region, however, cultivation is only possible with manual labour as, for instance, in the deep ravines of Yunga, where coca and coffee are grown. It is impossible to generalize as regards the soil, as it also varies considerably. On the whole, though, it may be said that it is of better quality than that of the Altiplano.

Owing to the limited arable area in the mountainous region, to the density of the population and to transport difficulties, the system of land tenure differs somewhat from that in other parts of the country. In the greater part of the valley region each square metre of arable land has a very high economic value and there is a great demand for its utilization. Therefore, there are greater contrasts here than in the rest of the country between the large and the small estates. The greater profitability of agriculture and the sobriety of the customs of the indigenous population have enabled the people to obtain small pieces of land which, on the whole, are far too small to facilitate self-sufficiency in foodstuffs.

At present this is the most important agricultural region in the country. A large proportion of Bolivian cereal production, especially wheat and maize, the whole of the temperate fruit crops and a large part of the tropical fruits, as well as the majority of vegetables consumed

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in the large urban centres, are produced in this area. In the warmer valleys coffee, coca, cassava, bananas, rice and sugar cane (for the manufacture of alcohol) are grown.

Agricultural production is considerably less risky here than in the high plateau and the crop yields are far higher. The quality of the produce is also better as the result of good climatic and soil conditions.

With the exception of certain isolated places, there are no specialized stock breeding areas; however, in those valleys where draught animals can be used, there is a fair amount of cattle production. Their development is normal both as regards size, weight and their haulage power. Sheep breeding is not very important, especially in the central valleys. Little has been done in the way of breeding hogs, though the prospects would appear to be good.

Dairy products have hardly been developed, chiefly because of their low price. However, there would also appear to be ample scope for improvement here, especially in the irrigated valley of Cochabamba.

The Eastern Plains Region

The whole eastern part of the country, from the northern limits with Brazil to the Paraguayan and Argentine frontiers in the South, consists of plains. This is the largest of the country's three divisions, covering about 60 per cent of the total territory but, because of the dearth of communications and the exceedingly low density of population, it is the least developed region.

The northern part, in the Department of Pando, and parts of the Department of Beni, have a decidedly tropical climate. Almost all this area is covered by dense forests, in which are found rubber trees and chestnut trees, the products of which form practically the only source of income in the region.

In the central region of the Department of Beni there are vast natural grasslands, on which, in 1947, there were from 700,000 to 800,000 head of cattle[1/] which received little tending by man. A large part of this area is flooded every year during the rainy season, causing great losses of livestock.

1/ Cattle Census of Beni, carried out by the Corporación Boliviana de Fomento (Bolivian Development Corporation).

A few small isolated spots in these areas are farmed, but only at subsistence level.

Further to the south, in the Department of Santa Cruz and in the larger part of the Provinces of Cercado, Warnes, Santiesteban, Ichilo and Sara, the richest agricultural region of Bolivia is found, with a temperate climate and an average annual rainfall of 1,300 millimetres. About 60 per cent of these rich fertile plains is woodland and, despite the high cost of clearing away the forest covering, it is this part which is preferred for cultivation. Just to the north of the town of Santa Cruz the "pampas" begin, that is, natural pastureland with scattered groves of medium-sized trees. The "black pampas" consist of soil of average consistency and fairly good quality, but in no way comparable with the fertility of the woodland soil. During the last ten years, with the introduction of farming machinery, the area under cultivation in this region is being steadily extended, though the yields are still low.

The "white pampas" consist of relatively unfertile sandy soil lacking in organic matter, and they are covered by poor pasture of low nutritive value.

Despite the extraordinary fertility of the soil and the excellent development possibilities, this region is sparsely populated and only about half of 1 per cent is cultivated. Some estimates go so far as to suggest that only one hundredth of 1 per cent is cultivated. The absence of an economic system of communication with the consumer markets seems to be the principal cause of the backwardness of this area.

The principal crops grown are sugar, rice and maize, whilst cassava, bananas, coffee and some citrus fruits are also of some importance. The climate and soil of the Santa Cruz area enables it to produce a variety of semi-tropical and tropical crops and there are good facilities for stock breeding.

In the southern part of the Department of Santa Cruz, towards the frontier with Paraguay and Argentina, the rainfall becomes scarcer and it is increasingly difficult to grow annual crops on a large scale without the assistance of irrigation. At present the limited area under cultivation is used to meet the demands of the small population engaged

in cattle breeding. With the help of irrigation some places in this region of Bolivia would offer ideal conditions for the cultivation of cotton and might well meet the requirements of domestic consumption

Ratio Between Area Under Cultivation and the Population

Preliminary calculations of the last census, show that about 75 per cent of Bolivia's population depend entirely on agriculture and animal husbandry for their subsistence.

According to official estimates made in 1947, of a total of 1,178,000 gainfully employed persons, 1,000,000 -- that is, 84.8 per cent -- are engaged in agriculture and livestock production. This estimate seems somewhat exaggerated because a fairly large proportion of the population draws its livelihood from trade, transport or seasonal employment in urban building and industry, rather than from agriculture. Moreover, a part of the population classified as agricultural labour is also engaged in mining.

Taking into account its total area, it may be said that Bolivia is under-populated, since its average population density is 3.2[1/] inhabitants per square kilometre. However, when the total area under cultivation and the rural population are considered, or, alternatively, the population exclusively engaged in agricultural occupations, it will be seen that in comparison with other Latin American countries, Bolivia is over-populated, as both the cultivated area per inhabitant and production per capita are very low.

It was estimated by the Ministry of Agriculture that during the agricultural year 1948-1949, about 350,000 hectares were cultivated throughout the country. Contrasting this figure with that of the population gainfully employed in agriculture, it will be seen that there is a total of about 0.35 hectares of cultivated land per farm labourer. The very low and fortuitous yields indicate that the cultivated surface is too small to maintain even the rural population. A more exact estimate would place the average cultivated area per agricultural labourer as being slightly more than about half a hectare per capita.

Comparing these figures with those of other countries, it will be seen that Bolivian agriculture is inefficient and that the country is over-populated within its present agricultural frontiers. The following

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1/ Figure calculated on the basis of the preliminary estimates of the 1950 population census.

/table shows

table shows the position:

Table 8 Bolivia: Number of Hectares under Cultivation per Person Gainfully Employed in Agriculture

Year of the Estimate	Country		Number of Hectares per Person Gainfully Employed in Agriculture
1939	United States	a/	12.8
1940	Mexico	a/	2.5
1946	Chile	a/	2.4
1940	Brazil	a/	1.9
1947	Bolivia	b/	0.35

Source: a/ Agricultural Development of Brazil [(Document E/CN.12/164/ Annex.B.) Economic Commission for Latin America, May 1950]

b/ Calculated on the basis of official estimates.

Comparing the total population with the cultivated area, it will be found that whereas in Bolivia there are 10 inhabitants per cultivated hectare, in Chile there are 3.7, in Brazil 2.5, and in the United States 1.02.[1/]

The foregoing figures, however, do not reflect the problem very accurately because, while in some regions of the High Plateau and in the valleys there is a far greater density of population than the average indicated, in the eastern plains the density of population does not even amount to one inhabitant per square kilometre. It should also be noted that in the eastern area agricultural tasks are entirely executed by manual labour, without the assistance of draught animals or any implement which might save time or effort. It will thus be seen that the question of distribution of population is extremely serious.

In the High Plateau, along the shores of Lake Titicaca, there is a much larger rural population than is required for the type of extensive farming prevailing there. Due to the system of land tenure and to traditional customs, the density of population varies from one part to another within the region itself. An investigation carried out by the Ministry of Agriculture in 1945 showed that, whereas there was a shortage

1/ This included only the surface on which 52 main crops are grown.

of agricultural labour in some parts, there was a surplus elsewhere. Thus on some estates the area given to each peasant in return for his labour was not more than one hectare, whereas on other estates it might exceed 30 hectares.[1] Along the shores of the lake there is a fairly large population which in return for a house, pasturage for a few animals and fishing rights, works on the owner's estate for one or two days a week.

In the southern region of the High Plateau, the population is relatively small because of the limited agricultural possibilities.

The Chaco War brought many of the peasants into contact with better food habits and other advantages of modern civilization, and as a result, many migrated towards the towns (especially La Paz). This trend was emphasized during the drought which affected the High Plateau between 1941 and 1945. This displacement of population was harmful to many farming areas, but in other parts it was not strong enough to relieve the congestion of the surplus population.

The obstinacy of the rural population in maintaining their customs and remaining on the small plot of land where they were born has not permitted any redistribution of the population within the High Plateau region itself, much less from thence to other parts of the country.

It is known that before the Spanish Conquest, the High Plateau was an important farming region which supplied the larger part of the requirements of its inhabitants. Since then, there is little doubt that the change from the communal regime of the Incas to a system of large estates has been detrimental to the indigenous population, lowering their social position and taking the land from them. Moreover, the constant increase of the population and its refusal to seek employment in other activities or regions have helped to make this situation even worse. Climatic conditions have also become less favourable and the soil has become increasingly impoverished.

Briefly, the position of the rural population of the High Plateau is as follows:

1) There is excessive population density in the northern regions, and especially in the neighbourhood of Lake Titicaca.
2) The inefficiency of the farming methods makesit necessa ry to utilize a large labour force for extensive cultivation of the area.

1/ Agro-economic Study in the Provinces of Los Andes, Omasuyos and Ingavi. (Ministry of Agriculture and Colonization.)

3) The rooting of the rural population to their plots of land has contributed to an even greater concentration of population in certain parts; moreover, a greater number of persons depend on one single cultivated area;

4) The prevailing system of land tenure has contributed towards reducing the amount of arable land available per gainfully employed person in agriculture and has prevented its better distribution. Every year large surfaces are left to "rest", and on many of the large estates only a minimum use is made of the land. This is also partly the result of low agricultural labour productivity.

The ratio between the area under cultivation and the population in the valleys also presents serious problems, though of a somewhat different nature.

Because climatic and soil conditions are favourable and higher yields are obtainable, the majority of Bolivia's rural population is concentrated in the arable area of this region. The density of the agricultural population in relation to the cultivated area is much higher than on the High Plateau, but even so, the standard of living and of nourishment is much better because the land provides higher yields.

The shortage of lands suitable for farming, together with the concentration of the population and the consequent abundance of cheap labour, have enabled large areas to be cultivated on the slopes and steep inclines where terracing is necessary before sowing (coca cultivation). It is naturally impossible to use agricultural machinery or draught animals in this area.

Another factor which has contributed greatly to the concentration of population in this region, is the fact that some of the valleys can be easily reached from the main consumer centres where surplus agricultural production is sold. It will thus be seen that the greatest density of population is located in the vicinity of the cities of La Paz, Cochabamba, Potosí, Sucre and Tarija, or, alternatively, these densely populated areas have good transport communication with these cities or large consumer centres. Just as in the High Plateau area, the farming population of some valleys is closely attached to its native plot. A survey conducted in the central valley of Cochabamba[1/] showed that 66 per

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1/ Olen Leonard-Canton Chullpas, Economic and Social Study in the Cochabamba Valley (Ministry of Agriculture, La Paz, 1947.)

/cent of the

cent of the agricultural population interviewed had remained on the same estates they were working since birth. There was even more stability among the landowners.

In other valleys, especially in the southern part of Bolivia, the position is different due to the annual immigration of large numbers of day labourers from the northern part of Argentina, in search of better working conditions. It is likely that this situation probably prevails to a greater extent in the poorer valleys where the population is denser. It is nevertheless obvious that in many of the richer valleys there has been an increasing pressure on the limited area under cultivation, causing the price of land to rise considerably. Many large landholders, tempted by this rise in prices, have sold their estates in small lots, the majority of which have been acquired by the peasants who formerly worked there as "peons". Thus there are now tens of thousands of small holdings, some of which are not more than 1,000 metres square. The average size of these holdings, however, fluctuates between one and three hectares, which even in the more fertile regions is insufficient to provide the owner and his family with a satisfactory standard of living.

The ratio between the cultivated area and the population in the eastern plains of Bolivia contrasts sharply with the position in the other two areas. In the Santa Cruz region, in which agriculture is of outstanding importance, the soil is fertile and there are large arable tracts, but these have not yet been developed, principally because of the shortage of agricultural labour.

The most primitive type of farming predominates in this region, and even more so in the rest of Eastern Bolivia, requiring a large use of manual labour. This results in a strong demand for labour which is met during the harvest by the seasonal transfer of labourers from other regions of the eastern plains.

Due to the system of land tenure, however, as well as to the existing customs of remunerating labour, and to the limited market for the products grown there (excessive transport costs to the consumer centres in the interior of the Republic), agricultural wages do not vary greatly from those paid in other parts of the country. Whereas wages in currency on the High Plateau were about 20 bolivianos, they were

/30 bolivianos

30 bolivianos in the valleys, and 40 bolivianos in Santa Cruz. 1/

There are several reasons for the continued shortage of population in Santa Cruz, the principal ones undoubtedly being the lack of good communications between this region and the principal consumer centres of the country, which has restricted the market for farm products, and the difficulty of getting groups of Aymará or Quechua people to move to tropical climates. Freight rates between the farm properties and the city of Santa Cruz, and between this and Cochabamba are prohibitive; products therefore become too costly to compete with those imported with preferential exchange from Peru, North America, and even from Europe and Asia.

In the other regions of Eastern Bolivia, there are very few populated areas, and the shortage of labour is the principal hindrance to development.

There is no doubt that problems of this nature can only be solved by means of a unified colonization programme, which would have to consider the possibility of reducing the congestion in the more densely populated regions of the valleys and the High Plateau. The difficulties and high cost entailed in such a project are obvious, but any large-scale agricultural development of the East will necessarily depend on the success in putting it into practice. It would undoubtedly be much more costly to colonize with immigrants, and it is possible that there would be equal or lesser chances of success than by colonizing with indigenous elements.

Systems of Land Tenure and Labour

Bolivian statistics indicate neither the number of land holdings nor their size, and it is therefore impossible to make a detailed study covering land tenure, its changes in the course of time and its influence on production. Consequently, it will only be possible to give a broad outline of the problem.

The typical features of farm property in Bolivia are the existence of a relatively small number of large estates which comprise the great majority of the area under cultivation, and the tens of thousands of small farms which altogether probably cover no more than 10 per cent of it.

Both the distribution of the land and the labour system vary according to the different regions.

Great estates predominate on the High Plateau, with areas exceeding a thousand hectares, and there are relatively few small farms. Data obtained from the office of Catastro Rustico in Oruro, provide information

1/ There are few farms in the eastern region which pay wages in currency; the majority pay by advancing large quantities of consumer goods.

/concerning the

concerning the distribution of farm property according to size in the Cercado province of this Department, and although this cannot be considered as representative of the whole High Plateau, it provides an approximate idea of the system of land tenure. It should be remembered that the greater part of the province is used for pasturing sheep. Farming production is limited to a considerable degree by the scanty rainfall, about 300 millimetres, and the low temperatures.

Some 29 per cent of the farms have an area between 1,000 and 2,500 hectares, 23 per cent are between 2,500 and 6,500 hectares, and 34 per cent cover an area exceeding 6,500 hectares. On the other hand, only 14 per cent of the farms have areas of less than 1,000 hectares.

Table 9 Bolivia: Distribution of Property According to Area in the Province of Cercado, Department of Oruro

Area in Hectares	Number of Farms
Less than 500	2
501 to 1,000	13
1,001 to 1,500	14
1,501 to 2,500	15
2,501 to 4,500	10
4,501 to 6,500	13
6,501 to 8,500	9
8,501 to 10,500	4
10,501 and over	21

Because of the better climatic conditions and the greater density of population in the region close to Lake Titicaca, the properties are somewhat smaller and are worked more intensively.

An analysis of figures taken from a survey conducted by the Ministry of Agriculture in 3 provinces along the shores of the lake, where a random sample was taken of 39 farms, shows that in this region there is a greater percentage of farms with areas between 500 and 1,500 hectares; that the percentage corresponding to farms under 500 hectares is also higher than that registered in Oruro and that there are very few estates exceeding 10,000 hectares. In recent years and at isolated points where weather conditions and the quality of the soils permits somewhat higher yields, a certain trend towards property sub-division can be seen. Moreover, it is known that certain landowners, in view of the difficulties encountered in continuing the existing labour system, and in view of the possibilities of obtaining good prices for their land, are planning to

/divide it

divide it into smallholdings.

On the whole, the position in the valley regions differs somewhat from that of the High Plateau, but the great estates still predominate in spite of progressive sub-division. In the richer valleys there is a marked trend towards sub-division of property, and as a result there is an even greater contrast between the great estates and the small farms. In the less fertile valleys, or those which lack good communications linking them with the consumer centres, this trend is not nearly so evident; the position in such valleys may only be compared with that on the High Plateau.

The trend towards sub-division is not recent, but has grown more pronounced since the crisis and the Chaco War. Wherever yields allowed the peasant population to accumulate savings, the people seek social and economic independence by purchasing a small piece of land where they can build their home and grow some of their own food.

In the principal valleys, particularly Cochabamba, a strong demand for small farms has arisen, with the resultant rise in prices. Despite this, however, the sub-division of properties has continued at a fast rate.

A study of the Chullpas Canton in the Cochabamba Department, although the system of land tenure is not completely representative, does provide a clear idea of the development which is taking place in the size of agricultural holdings. Chullpas provides a typical case history for the region. The whole Canton was at one time a single estate purchased in 1828 by a person who retained it for the greater part of his life. In 1870 the estate was divided among his ten sons who little by little, sold their portions. Today no one belonging to the original family owns land in the Canton.

"Of all the types of farm operators in Chullpas, seven (3 per cent) operated lands of less than one 'almud', that is less than a tenth of a hectare. This scarcely exceeds the area of a small garden, and is obviously insufficient to provide more than a part of the foodstuffs required by a small family."(See Table 10.)[1/]

1/ Olen E. Leonard: op. cit. Page 29.

/Table 10

Table 10 Bolivia: Size of Property in the Chullpas Canton By Type of Operator a/

Area in square metres	Proprietors N°	%	Part owners N°	%	Share croppers N°	%	Peguj.b/ N°	%	Total N°	%
Less than 900	7	5.9	0	0	0	0	0	0	7	3.0
900 to 5399	41	34.5	4	5.2	2	11.7	1	4.6	48	20.4
5400 to 10799	11	9.2	15	19.5	7	41.2	14	63.6	47	20.4
10800 to 29999	39	32.8	43	55.8	8	47.1	7	31.8	97	41.3
30000 to 99999	16	13.4	15	19.5	0	0	0	0	31	13.2
No data available	5	4.2	0	0	0	0	0	0	5	2.1

a/ Olen E. Leonard: Op. cit. Page 29.
b/ Labourers paid in kind (especially land).

However, this is not the whole story concerning smallholdings, because the problem is aggravated by the fact that many farms are divided into small and minute proportions which are separated from each other. In this same Canton of Chullpas, "of the 237 families which cultivate one or more units of land, only 73 were working one single unit, 67 were working 2 units and 46 worked 3. Other families had as many as 6, 7 or 8 allotments each, and finally, there were four families each possessing 11 or more separate lots."1/

As may be gathered from the foregoing quotation, the central valley of Cochabamba has greater problems due to the extreme sub-division of property. Bolivian legislation has only tried to prevent such splitting-up in the area watered by the "La Angostura" system of irrigation works, but has not been concerned with the rest of the country. It should be remembered moreover, that in the principal valleys and particularly in the Cochabamba valley, the existing great estates cannot be compared with those of the High Plateau and the East; here there are only a very few estates with an area exceeding 10,000 hectares. Even in these cases, the greater part of their property is not in the region of flat, rich lands, but rather in the neighbouring hills, extending to the peaks where they may possess extensive areas. Here, however, the climate resembles that of the High Plateau and production is more haphazard, and smaller. Moreover, it is essential to remember that in the richer valleys, farms exceeding 500 hectares are considered large.

1/ Olen E. Leonard: Op. cit. Page 33.

/The great

The great estate system predominates in the eastern plains. As this region is still sparsely populated, the estates retain the original areas owned when the Republic was founded or when, at the beginning of the century, these lands were sold at the price of 0.10 bolivianos (0.027 dollars at the exchange rate of the period) per hectare. This explains why estates frequently cover 10,000, 20,000, 30,000 or more hectares.

A survey conducted in the more intensively cultivated area of Santa Cruz showed that among 48 properties reviewed, 27 had areas exceeding a thousand hectares and of these, 6 had over 20,000. At the other extreme, there were only 8 with areas below 50 hectares.[1/] The proportion of smallholdings declines and almost disappears in the regions further removed from this farming centre.

During the last ten years, and particularly since construction began of the highway from Cochabamba to Santa Cruz, a strong demand has arisen for farming and timber properties in that region. In view of its great possibility of becoming Bolivia's principal farming region, there has been considerable interest in investing domestic and foreign capital there (particularly Argentine and Brazilian capital), with a view to starting farming and industrial exploitation.

Apart from private property, Bolivia has what is called the "communal system", that is, more or less extensive areas of land which were formerly granted to the indigenous population for working on a communal basis for their personal and exclusive benefit. The position has remained the same under the Republic, as there is a law which declares that all communal property belongs to the State and is ceded on a permanent basis to the peasant in return for a nominal tax, payable each year. The purpose of this law is to prevent the transfer or sale of these lands to third parties.

Within the "community", the system of tenure and use of the land differ very little from private holdings. Each "comunero", whether his ancestors were the original lessees (i.e. when the titles come down from colonial times), or whether he or his ancestors entered the community at

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1/ Olen Leonard: Santa Cruz- Estudio Económico y Social de una Región (Ministerio de Agricultura, Ganadería y Colonización.)

/a later

a later date, possesses one or several allotments of land with defined limits, distributed over the different areas under cultivation in the community. The original lessees usually possess larger areas than the newcomers, and therefore pay a higher proportion of taxes to the Government

The "communities" are generally very large but the corresponding area allotted to each "comunero" varies in accordance with the number of families in the community. In the survey conducted by the Dirección General de Economía Rural, covering the communities in the provinces of Omasuyos and Ingavi, it was found that of 16 communities, in one the area corresponding to each "comunero" was only 2.7 hectares; in another. this rose to 8 hectares, whereas in four more the area ranged between 73 and 83 hectares. In another group, the areas were even greater, and there was even one case where the "comuneros" as a whole owned certain properties in the valleys, which were worked exclusively as private property.[1/]

In 1941 there were 306 communities in the whole country.[2/] This number was somewhat greater in former times, because in spite of existing laws, some of them were transferred for various reasons to private hands, with the resulting loss of the rights of the "comuneros".

The distribution of property, with all its defects and injustices, cannot be considered by itself as a factor holding back agricultural development, because it is closely linked with the labour and land tenure systems, which together aggravate the problem and make it difficult to solve.

When the Spaniards arrived, the Indian lost his right to the land, and practically became a part of it.[3/] This position continues to the present day, because in exchange for small plots which are given them to grow their own food and keep their livestock, they are obliged to give their own services during three, four and more days of the week, and

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1/ Dirección General de Economía Rural: Estudio Agro-económico de las provincias de Los Andes, Omasuyos e Ingavi. 1945.

2/ Ben. H. Thibodeaux: An Economic Study of Agriculture in Bolivia. (United States Department of Agriculture, Washington D.C. 1942.)

3/ The land was allotted to the conquerors and the Indians living on it were also allotted, as part and parcel of the land.

moreover, to provide the animals and implements for cultivating the proprietor's lands, with no additional remuneration. They were also obliged to provide a series of additional services which included the transport of agricultural production to the consumer centres, with their own animals, the service of "pongo" or servant in the proprietor's house for a given number of days in the year; that of shepherd, once every so many years. etc.

Some of these burdens have been abolished, but the system still continues (varying with the different regions), whereby the peasant has to work three or four days a week for the estate owner in exchange for a small plot of land and the right to a house and pasturage for a given number of animals.

In the estates on the High Plateau, each peasant or peon receives, in exchange for his work, areas varying between one and fifty or more hectares, depending on the size of the estate and the number of peasants dwelling on it. The quality of the lands cultivated by these also depends on the particular region, but in general, the estate owner keeps the richest lands for himself. In this way, an average of 60 to 70 per cent of the property is given to the colonists for their own personal and independent benefit. There are only isolated instances of the estate owner taking a small percentage of the colonists' own production as a contribution towards the payment of the property taxes on the estate.

The area of land corresponding to each peasant is not, in general, made up of one single field or unit, but is rather distributed in small lots in accordance with the rotation system of the estate.[1/]

In the valley region, the area corresponding to each peasant or pegujalero is smaller, due to the greater yield of the land, but at the same time, the services which they have to provide to cover the "rent" are somewhat less onerous. In the majority of cases, they have to work for the proprietor three or four days a week, but they are not obliged to contribute the services of an assistant or the use of their draught animals and implements, as is the case on the High Plateau. As regards the other personal services ("pongo" or servant, shepherd, milkman etc.), the burdens are also less. In certain cases, the worker receives, moreover,

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1/ In order to prevent greater stripping of the soils, the great majority of estates divide their land into "zonas de rotación o ainokas" (rotation regions) where the central part is made up of one or more fields used for the owner's crops, and one or more plots for each peon who works on the estate. Some of these are cultivated each year, while others are left for animal pasturage (fallow).

/a small

a small premium or "ration" in currency for each working day. On the estates possessing lands in the high regions (estancias) each peasant may cultivate the area which he wishes, paying a rent of 50 per cent of the total yield of the crop.

Within these regions there are other forms of service in exchange for the right to cultivate a strip of land. It would take too long to describe them all, and it suffices to state that, in summary, the results are the same: an assured and permanent labour supply is obtained at a very low cost which only allows the worker to maintain a primitive standard of living.

In the eastern region the custom is usually to remunerate agricultural labour with a daily wage plus food, housing and even a piece of land for cultivation. Nevertheless, in spite of the shortage of labour, this wage is low and does not permit the worker a higher standard of living than that of the peasants in the rest of the country. Moreover, the isolation of the farms and bad communications encourage a system of credits granted by the proprietors in the form of food, clothing, etc., so that the workers remain in debt, which must be paid in labour; in this way, the proprietors are assured of a certain number of workers for varying periods of time.

Since 1945, when laws were introduced prohibiting certain of the services and obligations which weighed on the agricultural workers, and reducing others, their position has improved somewhat, particularly in the more accessible estates.

It is easy to understand that with the systems of land distribution and labour already described, Bolivia's agricultural development could hardly be expected to achieve any important momentum. The system of land tenure concentrating large ares in the hands of a very few owners, who lack the initiative and capital to undertake a more rational exploitation, linked with the difficult climatic and soil conditions which predominate in Bolivia's farming regions, prevent the cultivation of the excessive amount of land lying fallow. This situation is further aggravated by the low productivity of farm labourers, as well as the primitive and inefficient implements available, which only permit the cultivation of small areas.

/As a result,

As a result, both in the valleys and on the High Plateau, as well as in the East, the large estates, on the pretext of following pre-determined crop rotations which do not "tire" or deplete the soils, keep large areas of land lying fallow, without making any use of them at all. There are farms in the High Plateau region where land is cultivated only once every ten years. Generally, however, the "rotations" are more frequent. This explains why only 350,000 hectares of the estimated 801,000 hectares of arable land in Bolivia are under cultivation; the remainder are presumably lying fallow.

These customs, and the fact that the uncultivated lands are used occasionally for pasturing, mean that the peasants are necessarily obliged to follow the same rotations as the proprietors, as their lands are usually distributed along the edges of the fields cultivated for the main property. The land is not enclosed, and the cultivation of isolated plots is exposed to great losses or damage caused by the herds of animals. Consequently, even in those cases where each worker has fairly large areas, force of habit, material impossibility or merely lack of initiative prevents him from cultivating greater areas than those absolutely essential to provide his meagre requirements. Moreover, as farming is mainly of the unirrigated variety, the proprietor requires the work of his people during the most suitable seasons for ploughing, sowing and other tasks, including the contribution of additional days which are later discounted when the immediate need has passed. As a result, when the colonist does have the time to work his crops, the season for doing so has passed, and consequently yields are lower and losses greater.

In view of this system, it is easy to understand that the High Plateau peasant has little enthusiasm for the work he does for the proprietor and resists the cultivation of larger areas than those established by custom.

The situation in the valleys is somewhat different. The utilization of the land on the large estates is somewhat greater than on the High Plateau, but even so, a large proportion of the land is not cultivated.

The system of work and its remuneration is essentially the same, although there are slight variations. Due to their higher yield and

/greater value,

greater value, the plots allotted to the peasants are smaller, but the obligations are similar, except in certain regions where the contribution of draught animals and implements is no longer customary. There is no doubt that the farm labourer in the valleys has a higher income than the peasant of the High Plateau; his food is better and therefore his output is greater. Nevertheless, the system itself, just as in the case of the High Plateau, provides the estate owner with abundant cheap labour to meet all the tilling requirements of his crops, which, as they are grown under primitive methods without the use of machinery or labour saving implements, require a considerable number of working days.

This is one of the principal factors which has seriously hampered the country's agricultural development up to the present time. The farming of the estates depends almost exclusively on the low cost of labour (remunerated by the allotment of lands) rather than on intensive and scientific methods. The estate owners are used to obtaining certain profits from their lands in return for only a very small investment of capital. The cash expenses in many cases are limited to the payment of an administrator or the purchase of some tools and the payment of the low property taxes. Normally, those areas are cultivated which can be tended by the peasants on the estate. It is therefore difficult for the owners to become accustomed to the idea of making investments, either in the form of payment for skilled services, or for the purchase of seed, and for fertilizers and machinery.

Many progressive estate owners have purchased mechanised farm equipment, but the majority consider the use of it to be uneconomic, because the cost of operating a tractor compares too unfavourably with the cost of manual labour. Only a few have expanded their area under cultivation by using machinery.

In the region of the eastern plains the systems of land tenure and labour are influenced by the sparse population and communications, with consequent shortage of markets. The large estate owners have to limit the cultivation of their lands to the number of hands available. On the other hand, the prices paid to the producer, because of the high freight costs,

/form another

form another factor limiting the level of wages, which in turn prevents the formation of savings which would permit the workers to acquire small plots of land.

In the last ten years, with the rise in prices and the prospects of new markets, in the Santa Cruz region there has been a strong trend towards mechanization, but as farm machinery is not used efficiently, the limiting factor is always the lack of labour.

In summary, then, any attempt to develop Bolivian agriculture would first have to remove the serious obstacle represented by the present system of land tenure and labour, and in turn provide the necessary economic means to permit better training of the farm labourer.

Climatic Difficulties - Irrigation

Climatic conditions are also a very limiting factor for Bolivia's agricultural development, above all in the High Plateau region and in the valleys. For example, summer frosts cause considerable damage, mainly on the High Plateau. Hailstorms and tempests cause sporadic, localized losses. It is the scanty and poorly distributed rainfall, however, which most seriously limits agricultural yields.

An examination of the available information concerning rainfall for the country's principal farming regions shows that in the majority the average rainfall is sufficient for limited "dry" farming, particularly when it is remembered that the rainy season coincides with the season of plant growth. For example, the region of Lake Titicaca shows a rainfall of about 500 millimetres a year; the valley of Cochabamba about 600; Sucre over 700, and Santa Cruz 1,300 millimetres. Occasionally, however, there are years of very little or badly distributed rainfall, with the resulting bad harvests. In the northern region of the High Plateau, it is considered that in each five-year period, due to these factors, one year shows a total loss for almost all crops, three show fair yields with partial losses, and only one may be considered a good year. In the southern part of this region, the position is even worse, because to the poor distribution is added a much lower rainfall which only permits the cultivation of certain drought-resisting crops such as barley for hay, and quinua.

/The situation

The situation is not so extreme in the valleys, but the crops often suffer considerable damage through long dry periods which are accompanied by intense heat.

In the eastern plains, rainfall does not present any great problem for farming. There are few dry periods, and in general, losses due to the weather are not very important.

Several factors which hamper agricultural development arise as a result of the scanty rainfall and its bad distribution.

The uncertain outcome of the harvests (particularly on the High Plateau) helps to curtail the farmers' enthusiasm for investing capital in their properties.

The use of farm machinery for tilling is hampered by the lack of opportune rains. There are years when, due to insufficient humidity in the soil, it is materially impossible to use mouldboard or disc ploughs drawn by tractors; only the colonial type of plough, drawn by oxen, succeeds in removing sufficient soil to facilitate sowing in dry land.

The use of certain commercial fertilizers which are immediately absorbed, is difficult and the results are hazardous because the periods suitable for their application may be very dry or excessively damp; in the first instance, their application is impossible, and in the second, the fertilizer is rapidly washed away by the rains before benefitting the plants.

Bolivian farming, in the regions described, would receive a great stimulus by the construction of irrigation systems. This is one of the important methods for considerably increasing the margin of safety for the crops and speeding up the change-over from primitive to modern large-scale farming.

Since 1939, the Bolivian Government has undertaken the study and construction of several irrigation projects, with a view to placing some 50,000 hectares under cultivation.

Table 11 shows the studies conducted up to the present, and the area which may be irrigated. Their execution is included within the plan termed Programa de Obras de Riego y su Plan Financial (1950-1954) (Programme for irrigation works and their financing (1950-1954)).

/Table 11

Table 11 Bolivia: Irrigation Projects Included in the "Programa de Obras de Riego y su Plan Financial (1950-1954)" and the Area which will Benefit Thereby

Name of Project	Location		Area to be irrigated
	Department	Agricultural region	
Tacagua	Oruro	High Plateau	4,500
Huarina-Peñas	La Paz	High Plateau	7,000
Laja	La Paz	High Plateau	6,300
Angostura	Cochabamba	Valley	8,500
Alalay	Cochabamba	Valley	1,500
Pilcomayo	Tarija	South West	16,000
Mairana and Valle Abajo	Santa Cruz	East	4,300

Projects for Desaguadero and Vicachani on the High Plateau have also been studied, as well as several other small works.

Total hydraulic resources in the arid and semi-arid regions would amount to some 200,000 hectares under unified planning. Difficulties of an economic and technical nature have, however, prevented the realization of these projects. None has been completed up to the present; one, the Angostura project, which in 1940 it was estimated would cost 22,500,000 bolivianos and would require three years for completion, is still only partly finished, as only a little over 3,500 hectares are being irrigated. A wide network of canals still has to be completed and the total cost of the project has risen to over 110 million bolivianos. Another, at Tacagua, is in course of construction but, as in the previous case, it is very much behind the original plans and the cost has so far exceeded the original budget.

It would be difficult to begin the other projects within the periods originally stipulated, because of the lack of funds for their execution. Of these, the one of greatest economic importance for the country is that of Pilcomayo in Villa Montes, Department of Tarija. This project was planned to irrigate 16,000 hectares with the possibility of expanding this area to 40,000 hectares. The climate and lands of the region are suitable for growing cotton, rice, oilseeds, fruit and sugar cane. There, are, however, problems of high freight costs and shortage of labour which can

/be solved

be solved by means of links with the new communication routes being constructed in the region, and by colonization.

The Irrigation System of "La Angostura" and its Problems

The inauguration of the first national irrigation system has brought with it a complexity of problems which had not been foreseen and which will have to be solved before long if this project is to yield the desired results.

The new irrigation system originally benefited an area of 3,500 hectares of relatively poor lands which could not be fully utilized on account of the region's scanty rainfall, only unirrigated crops with sparse and occasional yields being grown. As the construction of the reservoir and canals proceeded, these lands rose in value. When the water arrived, the rise in prices was sharper, reaching levels which were not justified by yields. In spite of this, the demand for these new irrigated lands did not diminish and the sub-division of many properties began forthwith, aggravating the problem described in the preceding chapter.

In order to control these strong tendencies, it was necessary for the Government to draft laws designed to control speculation in rural property and its division into very small lots.

From a technical viewpoint, the preparation of new irrigated areas made it all the more necessary to provide an efficient agricultural extension service. The farmers who were used to dry crops met with serious difficulties in the use and handling of the water. Problems of erosion and washing away of soils were felt immediately as a result of the use of excessive quantities of water and the poor outline of the irrigation ditches.

The lands continued to be cultivated under the same primitive methods used until then and only in some cases was mouldboard ploughing introduced with a fixed shaft, and of a size small enough to be drawn by oxen. Modern methods of cultivation are almost entirely unknown and only traditional rotation systems practised, which contributed little to the preservation of soil fertility. The experience of the experimental station of "La Tamborada" is still too recent to have been used by the farmers.

From the economic viewpoint, the incorporation of new lands in the irrigation system did not provide the expected results, because, due to the technical deficiencies and the relative poverty of the soils which were originally irrigated, yields were not very encouraging and costs were somewhat high. Nevertheless, production in the region increased

/considerably, causing

considerably, causing serious problems due to the limited demand of the local market and the lack of distribution systems adequate for incorporating other markets. These difficulties resulted in the fall of some prices, particularly those of perishable products.

From the Government point of view, the dam at La Angostura was conceived with the main object of increasing wheat production; however, only a small proportion of the total area was assigned to this crop, as the farmers preferred to employ their efforts in crops with a greater cash yield, such as pulses, alfalfa, potatoes and maize. It was not until 1948, due to the high price quoted for wheat, that the area assigned to its cultivation increased considerably. Nevertheless, the attack of rust and damage caused by birds will be factors limiting future production, both for summer and winter wheat.

Modernization of Agriculture

Bolivian agriculture, except for a small sector of growing importance, is in a primitive state, depending exclusively on cheap labour and primitive methods rather than on the use of intensive and scientific methods.

There is little Government intervention to foster agricultural activity, and this added to many other factors of a physical, economic and social nature has stultified the farmer's initiative, this in turn having resulted in the stagnation of the country's agriculture.

From the Government point of view, the production of foodstuffs has not been a matter requiring urgent attention. Except for the last two years, even at the cost of prejudicing other sectors of domestic economy, there have always been sufficient funds available to import those foodstuffs which domestic farming and stock breeding have been unable to provide.

In order to foster agriculture, the Government maintained a Ministry of Agriculture between the years 1905-1910, 1936-1940 and from 1942 onwards. However, this Ministry has always been assigned such minute portions of the national budget that it was unable to carry out any work on a broad scale. Table 12 gives an exact idea of the importance given to the Ministerio de Agricultura, Ganadería y Colonización within the national budget.

/Table 12

Table 12 Bolivia: National Budget Funds Allocated to some Ministries

Years	Ministry of Agriculture		Ministry of Education		Ministry of Defence		General Budget of the Republic
	Millions of Bolivianos	% of the total	Millions of Bolivianos	% of the total	Millions of Bolivianos	% of the total	
1936	1.5	1.15	6.6	5.07	41.9	32.2	130.1
1937	..		..		..		..
1938	4.5	0.71	23.3	3.7	175.0	27.91	627.0
1939	..		..		..		..
1940	11.5	1.83	80.0	12.75	175.0	27.91	627.0
1941	..		..		..		..
1942	..		..		..		..
1943	35.3	2.88	168.0	13.69	246.0	20.05	1226.9
1944	31.3	2.40	169.1	13.08	273.7	21.17	1293.2
1945	33.7	2.54	193.5	14.80	265.5	20.3	1307.6
1946	29.8	2.32	201.4	15.66	275.5	21.42	1286.4
1947	25.4	1.73	260.0	17.65	240.0	16.3	1472.7
1948	34.5	1.74	386.9	19.49	391.7	19.73	1985.1
1949	23.2	1.09	372.5	17.53	391.7	18.43	2125.4

Source: 1936, 1938 and 1940 - Budget of the Republic.
1943-1949 Annual Report of the Central Bank.

In 1942, when the Ministry of Agriculture was reinstated, an attempt was made to give it a more solid organization of higher standing; however, the funds assigned to it only allowed it to carry out administrative work, with few development activities. In the course of time the position worsened considerably because as inflation increased this Ministry's budget was reduced both in world figures as well as in proportion to the country's general budget. The amount assigned to it dropped from 35.3 millions in 1943 to only 23.2 million bolivianos in 1949, so that there was a decline of 34.3 per cent. In relation to the general budget, its share fell from 2.88 per cent in 1943 to 1.09 per cent in 1949, that is, a reduction of 47.6 per cent.

Apart from the ordinary budget, certain additional funds have been set aside for the construction of irrigation works, but these sums were never large enough to permit the prompt completion of the works envisaged, which were begun several years ago.

Among the principal objectives causing the Government to set up a new Ministry of Agriculture in 1942 was the improvement of the technical level of agricultural activities by means of research and agricultural extension services. The conviction had been reached that the prevailing methods of

/farming - which

farming - which still predominate with very few changes at the present time - made it practically impossible to improve domestic production. Cultural practices throughout the country were governed by the models introduced by the Spaniards at the time of the colony or by methods inherited from the indigenous population. Selection and genetic improvement of seeds was unknown; crop rotations had no technical function; neither organic nor inorganic fertilizers were used; agricultural pests and diseases caused tremendous damage, and modern storage methods were unknown. In summary then, both proprietors and peons lacked any knowledge of modern methods of cultivation and were left to their own devices, because they received no official guidance or protection. The few isolated instances of progress were due to the private efforts of certain progressive estate owners who, either alone or in co-operation, sought methods of improving their production.

In spite of the Government's good intentions, the Ministry of Agriculture was unable to do much to improve the situation described; the budget assigned to it prevented it from attempting far-reaching agricultural research. Only very limited assistance could be given to the farmers through the office of Agricultural Development, with its services for the renting of farm machinery and the sale, at cost, of certain imported seeds and implements. In addition, it was possible to provide some technical guidance, on a very small scale, but this was based on theoretical knowledge, because there had been no experimentation, and this is the basis of all agricultural extension services.

After 1947 the situation underwent an encouraging change because, with the assistance of the United States Government, the Servicio Cooperativo de Estaciones Experimentales was inaugurated as an integral part of the Ministerio de Agricultura. This Experimental Station Service had its principal research centre in the valley region, Cochabamba, with two additional stations, one on the High Plateau, near Lake Titicaca, and the other in the eastern plains of Santa Cruz. Interesting research work was commenced immediately, particularly as regards the selection, improvement and acclimatising of varieties of the most important crops and grasses for each region. These experiences will play an important role in the country's agricultural development, particularly if they continue on a sufficiently large scale and during the necessary period. Among the organization's plans is included also the work of improving

/stock breeding

stock breeding.

An integral part of this organization was the establishment of a good agricultural extension service, which has already carried out effective work among the farmers, spreading the preliminary results which are being obtained in the experimental stations and teaching the general principals of agricultural technique.

The other departments of the Ministry continue struggling within a very small budget which only allows them to carry out purely administrative work.

Technical Instruction

Bolivia has one agricultural school at a university level in the city of Cochabamba. Here again, the lack of funds has hampered the institution's progress, as up to date it has had limited means both as regards professors and educational equipment. Nevertheless, some work on genetics has been done with potatoes, maize and quinua.

As this Faculty is located in the temperate zone, it has mainly attracted students from the valley region, and only a few from the other two regions with different climates. The formation of teaching centres at University level on the High Plateau and in the east appears essential in order to raise the technical level of agriculture.

Apart from the Faculty of Agronomy at Cochabamba, there are three practical schools on a much lower educational level, but these also have found their work practically nullified by the shortage of funds.

The small number of technicians in Bolivia provides a clear indication of the backward state of agriculture. At present, the number of Agronomous Engineers who have graduated either from the National University or from foreign universities, does not exceed 80, and there are only 20 veterinarians. It is worth noting, however, that very few estate owners request the services of technicians, because this would require the investment of working capital, to which they are not accustomed. As a result, nearly all the technicians work for the Government, on their own private properties or in activities outside their profession.

Mechanization

Over 90 per cent of the country's agricultural work is carried out using primitive implements. In the eastern region, as well as in the mountainous districts and in parts of the High Plateau, the tilling of the

/soil and

soil and other tasks are carried out exclusively on the basis of human labour with the assistance of manual implements. More commonly, however, the Egyptian type of plough, drawn by oxen, is used. The intermediate tasks and the harvest are also carried out exclusively by hand. Under these working conditions, it is easy to deduce that the productivity per man is very low.

The introduction of farming machinery is relatively recent, as until the middle of the 'thirties, there was little interest shown in improving the methods of cultivation. Until 1937, the number of tractors imported annually was insignificant. After 1938, mainly due to the active propaganda carried out by agents of farm machinery manufacturers, a greater number of tractors and implements began to be imported. The inauguration of the Departamento de Crédito Rural in the Banco Central in 1941, gave great encouragement to mechanization, and as a result, in 1942, tractor imports for strictly agricultural purposes were the highest for the decade. In subsequent years, imports of wheeled tractors declined, while those of the caterpillar type increased. (See Table 13)[1/]

Table 13 Bolivia: Imports of Tractors from the United States 1935-1949

Years	Wheeled Tractors	Tracklaying Tractors	Total
1925	12	1	13
1926	4	-	4
1927	5	-	5
1928	1	-	1
1929	-	3	3
1930	7	3	10
1931	-	1	1
1932	-	6	6
1933	-	1	1
1934	-	4	4
1935	-	-	-
1936	-	1	1
1937	-	3	3
1938	6	10	16
1939	11	18	29
1940	15	9	24
1941	75	21	96
1942	19	20	39
1943	58	15	73
1944	47	33	70
1945	56	17	73
1946	58	51	109
1947	45	33	78
1948	40	41	81
1949	56	39	95

Source: Foreign Commerce and Navigation of the United States 1925-1929.

1/ About 99 per cent of the tractors imported into Bolivia come from the United States, so that Table 13 may be taken as representing total imports.

/Assuming that

Assuming that about 50 per cent of the tracklaying tractors are used for farming[1], and that, due to the scanty use made of machinery the tractors imported during the last fifteen years are in useful working condition, it may be said that at present Bolivia has over 600 tractors for agricultural uses.

The ratio between the total area under cultivation and the number of tractors in operation - 700 hectares per tractor in 1947, would lead to the belief that Bolivia's degree of mechanization is only slightly lower than that of the best-equipped countries in Latin America.[2] The real situation, however, is different: at present, less than 600 farm properties have the permanent use of one or more tractors. In view of the inefficient way in which farm machinery is used, the technical difficulties and the plentiful supply of cheap labour, it is unlikely that each tractor really cultivates more than 50 hectares. A detailed survey made by the Mixed Working Group of CEPAL-FAO (Economic Commission for Latin America and Food and Agriculture Organization) found that only about 20,000 hectares, that is, 5.8 per cent of the total, were mechanized in 1948.

A glance at Table 14 shows that the use of machinery in Bolivia has been mainly directed towards heavy work, that is, soil preparation. The large number of ploughs and harrows,[3] and the shortage of other machines and implements, show that the tractors are used inadequately and evidently uneconomically, as it is known that operating costs are greater when the hours of work are less, particularly in view of the high interest rates which have to be paid by semi-fixed capital. Under present conditions, the majority of tractors work almost exclusively for ploughing and harrowing, and a little for transport.

1/ This assumption is made in view of the fact that the majority of tractors of this type imported by the country have less than 49 horse-power at the drawbar, that is, a power and weight lower than that normally used for industrial work.

2/ There is no doubt that the official calculation of area under cultivation has been underestimated, as only 340,000 hectares were considered. It is very likely that this figure is higher than 400,000 hectares.

3/ No discrimination has been made between implements which are mechanically drawn or by animals, but the number of harrows, which are generally drawn by machine and are usually purchased in combination with a plough, lead to the assumption that the number of ploughs of this type would be similar.

/There are

There are many reasons for the inefficient use of mechanized equipment. Among these, the most important are:

1) The abundant cheap labour available, generally obtained in exchange for the use of given areas of arable land. Although in some cases this form of compensation may be uneconomic for the proprietor, this is not generally so, and usually it assures him of a labour supply with no investment of capital and without risks.

From the point of view of the proprietor, these working conditions compete favourably with any other system which it may be desired to introduce, and which would entail the investment of fixed or working capital.

There is therefore little interest in mechanization, particularly among a sector of the great estate owners.

Table 14 Bolivia: Farming Machinery and Implements Imported from the United States, 1938-1949

Years	Ploughs	Harrows	Cultivators	Grain Drills	Reapers	Combines	Threshers	Maize Shellers
1938	173	6	11	6	2	-	56	22
1939	261	31	3	3	-	2	9	10
1940	497	137	27	8	5	8	11	96
1941	550	79	8	18	21	10	4	15
1942	54	55	49	1	7	4	-	-
1943	409	115	7	20	44	17	8	3
1944	1210	58	6	5	-	1	1	20
1945	80	19	4	9	25	-	-	-
1946	16	37	1	11	10	6	6	-
1947	24	9	100	24	11	2	-	10
1948	20	13	2	14	19	-	2	13
1949	352	38	16	9	-	5	-	41
Total	3646	597	235	128	144	55	97	230

Source: Foreign Commerce and Navigation of the United States, 1938-1949.

This may be proved by the experience of a fair number of farmers in relation to the purchase of mechanized equipment. Lured by salesman's propaganda, they purchased machinery of different classes and types. Nevertheless, when they noted that the operation of this equipment represented a fairly large outlay of money for fuel, spares, personnel etc., and that the harvest yields did not improve as

/expected, they

expected, they chose to reduce the operation of the machinery as much as possible and return to using the primitive methods of their peasants. This explains why imports have preferably been for implements for the heavy working of the soil - ploughing and harrowing - and not for those designed for tillage operations and the harvest.

2) The purchase of unsuitable equipment. The farmers' lack of skill caused the majority of them to purchase equipment which was unsuited to the size and features of their properties and farms. There was a marked trend towards the purchase of large size tractors which are too costly when used for light work. Their use is limited, therefore, to work of soil preparation and, in some cases, to transport work; during the greater part of the year, then, there is immobilised capital paying high interest rates.

3) Unskilled operators and poor repair services.

4) Unfavourable climatic conditions. As a result of the badly distributed rainfall and the dryness during the period of soil preparation, mechanical tilling is hampered, particularly when dealing with compact soils; mechanical ploughs are unable to penetrate properly, and at times it is necessary to resort to the use of the native plough for preparatory work.

These factors, apart from contributing to the inefficient operation of existing farm machinery, hamper the greater development of mechanization. There is no doubt that the principal factors which have delayed this process are the systems of land tenure and labour, and the consequent cheap cost of labour. The ratio between the daily wage value and the machine value is unfavourable to the latter. The initial investment which has to be made by the farmer in order to purchase modern equipment is very high and there are relatively few who find such an investment justified, particularly when there are no strong pressures of an economic nature. To these should be added other reasons which also hinder a greater degree of mechanization.

There are few farmers with sufficient capital to purchase mechanized equipment. In addition, there are few farm credit facilities, and terms, even when a loan can be obtained, are onerous, particularly as regards guarantees and periods of amortization. Farm machinery is therefore beyond the reach of those who need it most, that is, the medium sized farms.

/The prices

The prices paid to the farmer have remained at lower levels than those which he has to pay. The policy of ceiling prices maintained by the municipalities since the 'thirties concerning foodstuffs, particularly during periods of shortage, and the absence of guarantees for keeping them at suitable levels during times of plenty, have prevented farm production from having an economic incentive. This is yet another factor which limits the farmer's desire to make investments.

A low level of agricultural prices should necessarily be compensated by low production costs. Under the present systems of remunerating labour, the nominal cost of production is small.[1/] The use of machinery entailing a heavy initial investment and high operating costs (fuel, lubricants, spares, tractor operators, amortization and interests) severely influence the cost of production, particularly considering that whether they work or not, the peasants employed by the estate continue to occupy the land assigned to them.

The size of property is another factor limiting the use of machinery. It has been stated that there are a large number of small properties, particularly in the valleys, where the use of motorized equipment and even of heavy draught animals would be uneconomic, and at times impossible. Although the majority of the small farmers are not in a position to purchase tractors and their implements, many of them seek the co-operation of the farm machinery services of the Ministry of Agriculture; the operating costs for this machinery on smallholdings are very high and generally discouraging. The situation on the large properties on the High Plateau is somewhat similar. The very widespread custom of splitting the land into small strips, around which are distributed very small plots of land to the workers on the estate, makes the use of machinery inefficient and costly.

The use of modern implements drawn by animals has also met with great difficulties. One of the principal factors limiting the employment of these tools is the small size of the draught animals - oxen - which

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1/ No survey has been made up to the present to determine the remuneration of agricultural labour under the present system; in the majority of cases, this is unquestionably miserable, but in others, it may be more or less high.

have not sufficient strength to haul medium-sized implements. 1/ It has only been possible to introduce in the valleys a small mouldboard plough with a wooden shaft fixed to the yoke of the oxen. Its small size and the rigidity of the different parts represents only a small advance over the wooden plough generally used. Other implements, such as cultivators, hillers, etc. are practically unknown.

Mechanization has also been hampered during the last few years by the difficulty of obtaining foreign exchange which would permit the import of machinery and spares. Within the sales of exchange for imports, only between 1 and 2 per cent of the total budget is granted for the purchase of farming machinery and implements, an amount which is insufficient to meet the requirements of the limited demand. In 1949, of a total of 48.2 million dollars granted for imports, agriculture's share was only 686 thousand dollars, that is, 1.43 per cent.

Productivity of the Farm Labourer

It has already been stated that, according to official estimates, the ratio between the area under cultivation and the population engaged in agriculture is lower in Bolivia than in almost any other country in Latin America, as there are only between 0.35 and 0.5 hectares per person. Nevertheless, about 80 per cent of the country's active population is engaged in agricultural work.

Whether this state of affairs is due to the system of property distribution, to the immobility of the rural population, to poor communications, to ignorance of modern farming methods, to poor use of labour, or to a combination of these and other factors, the net result is that the productivity of farming is low. This is even more apparent when it is remembered that the large proportion of active population engaged in rural work only produces part of the country's requirements for food and agricultural raw materials, leaving scarcely any surplus for export, the situation being rather that considerable quantities of these materials and foodstuffs have to be imported to meet the deficit of domestic production.

The inefficiency of the farm labourer must be added to the fact that large masses of population are concentrated in a few parts of the country, causing pressure on the land and giving rise to problems of a

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1/ The poverty of the soils and pastures on the High Plateau has brought about a degeneration of cattle, resulting in small animals without strength.

social and economic nature. In fact, the working methods employed make it essential to use excessive quantitie of labour even for the simplest tilling operations or crops. Under these conditions, the existence of a strong concentration of agricultural population is essential, up to a certain point. There is no other explanation for the increasing difficulties being experienced by some rural proprietors in view of the slight drift of farm workers towards the cities and the relative shortage of labour which this represents.

A study of the number of man-days required for any farm work shows the waste of human effort in farming. A discussion of this subject involves considering once more, separately, the country's three typical regions, due to the considerable differences existing both in the prevailing working methods used and in the output of workers and animals.

As no crop is common to the three regions, separate comparison will be made of products which are common to at least two of them. (See Table 15).

Table 15 Bolivia: Man and Animal Hours Employed for Cultivating One Hectare of Wheat (Unirrigated) on the High Plateau and Cochabamba

Nature of Work	High Plateau		Valley	
	Man-hours	Oxen-hours	Man-hours	Oxen-hours
Soil preparation				
Ploughing	48	96	40	80
Cross ploughing b/	64	128	64	128
Harrowing b/	-	-	16	32
Clod breaking	112 a/	-	-	-
Sowing				
Marking for sowing	-	-	2	4
Broadcast sowing	3	-	3	-
Seed covering	16	32	16	32
Cultivation				
Weeding	24 a/	-	48 a/	-
Harvest				
Hand reaping	56		48	
Transport to the threshing floor	6	6 b/	10	
Threshing and winrowing	128 c/	-	60	80 d/
Sacking and transport	2	8	3	9
Totals	489	270	310	365

Source: Unpublished surveys.

a/ Women and children; b/ Donkeys; c/ With spades; d/ With donkeys and oxen.

/Table 16

Table 16 Bolivia: Man and Animal Hours used for Cultivating One Hectare of Maize in the Valleys and in Santa Cruz

Nature of Work	In the Valleys		In Santa Cruz	
	Man-hours	Oxen-hours	Man-hours	Oxen-hours
Soil preparation	-	-	108	
Weeding with spades	-	-	108	
First ploughing	40	80		
Cross ploughing b/	64	128		
Harrowing b/	16	32		
Sowing	21 a/	28	54	
Cultivation				
1. Hilling and weeding	8	16	90	
2. Hilling and clearing	-	-	90	
Harvest				
Plucking maize ears	32		28	
Transport	8	4 b/	8 c/	
Shelling with a stick	106		96	
Winnowing, sacking etc.	10	-	10	
Totals	325	288	480	

Source: Unpublished surveys; B.N. Thibodeaux: An Economic Study of Bolivian Agriculture, (O.F.A.R. United States Department of Agriculture, Washington, D.C. 1942.)

a/ Men and women; b/ Donkeys; c/ Transport is effected in bullock carts.

According to the survey by B.H. Thibodeaux, - An Economic Study of Bolivian Agriculture, - the number of man-hours and animal-hours for some crops are much higher than those noted here.[1/] For example, on the High Plateau he assigns 1,621 man-hours and 496 oxen-hours for the cultivation of a hectare of barley, while for a hectare of potatoes he gives 2,820 man-hours, 996 oxen-hours and 270 donkey-hours. On the eastern plains, he

1/ The amounts of work noted seem to be a little exaggerated, above all as regards the number of ploughings on the High Plateau, as for barley he gives one breaking and four cross ploughings and for potatoes one breaking and seven to eleven cross ploughings.

/assigns 776

assigns 776 man-hours for a hectare of rice and 392 hours for a hectare of maize, without including the stripping of the grain.

The corresponding data in Tables 15 and 16 refer to crops grown on the land used for the estate owner himself. As a general rule, the peasants or workers devote less man-hours and animal-hours to their own land, as they prepare the soil at the most with one ploughing and one cross ploughing; in many cases, the cross ploughing also serves to cover the seed. They also use a large number of women and children, whose output is lower. Altogether the cultivation of a hectare of wheat on the High Plateau takes about 350 man-hours and in the valley, a little more than 230 man-hours.

Comparing the three regions, it may be noted that the valley worker's output is much higher. There are several factors contributing to this greater efficiency, the following being among the most important:

1) Due to climatic features and the quality of the soil, the valley worker has a more balanced and plentiful diet than those of other regions, and consequently a greater source of physical energy.
2) The valley worker usually has stronger and bigger draught animals than the peasant of the High Plateau; the animals on the high lands graze only on barley straw or tough grasses, whereas those in the valleys eat better quality grasses. It is also important to remember that on the High Plateau the farm labourer is obliged to contribute his own draught animals to the tilling of the proprietor's land; the animals are therefore forced to work continuously and this wears them out faster. In the eastern plains, almost all the work is manual,[1/] oxen being used only for drawing carts.

A comparison of the amount of labour used for cultivating the same product under approximately similar methods in several countries shows that Bolivia is not at a great disadvantage. For example, the cultivation of one hectare of maize in Mexico requires 477 man-hours when the work is entirely manual, and 297 man-hours and 203 oxen-hours when these animals are used;[2/] Bolivia uses 480 man-hours in the first instance, and 325 and 288 respectively, in the second. In Chile, in the irrigated land of the central region, using mouldboard ploughs drawn by oxen, the amount of work required

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1/ It was already shown that more mechanization had been introduced in the eastern region, so that at the present time there are numerous exceptions to the statement in the text.

2/ John A. Hopkins: Mexican Farm Wages and Farm Labour Productivity, Foreign Agricultural Report N°46, (Office of Foreign Agricultural Relations, United States Department of Agriculture, Washington D.C.)

per hectare is much greater, due to the fact that tilling operations are more comprehensive, from the preparation of the soil to the harvest; 427 man-hours and 307 oxen-hours are required in Chile for the same hectare of maize.[1/] A comparison of these figures with those for the more mechanized regions of the United States, shows that there is a tremendous wastage of human potential in these countries, since in the State of Iowa, with complete mechanization, only 41 man-hours are required for the cultivation of one hectare of maize.[2/]

As regards wheat cultivation, the High Plateau region of Bolivia is at a marked disadvantage in relation to the region of the valleys and even more so in relation to other countries, as while 489 man-hours are required there for cultivating one hectare, only 310 are necessary in the valleys. In the Puebla-Tlaxcala region of Mexico, only 257 man-hours are required for irrigated wheat, and in Valdivia, Chile, 249, using oxen, mouldboard ploughs, carts and machine threshing. On the High Plateau, the principal disadvantage lies in the fact that winnowing is done by hand, using a species of club, and threshing is also done by hand, the wheat being beaten with long curved sticks until all the grain is separated from the tassels. In the State of Kansas, with completely mechanized cultivation, one hectare of wheat requires only 11.4 man-hours.

Low and uncertain yields are added to the high labour input. The farm worker's productivity is therefore very low. Unfortunately, there is not sufficient information available to make a comparison between different years and discover whether the position has improved or deteriorated in the course of time. It may be stated, however, that for various reasons the average productivity of the farm labourer has improved on a very small scale or has at least remained stationary.

On the one hand, the introduction of small quantities of farming machinery and implements must have reduced the amount of labour used, even though this reduction is barely perceptible. Possibly the introduction of the wooden shaft mouldboard plough has had the greatest influence on reducing the number of hours used for preparing the soil; the use of this

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1/ E/CN.12/164 Appendix C. Agricultural Development of Chile - page 80.

2/ E.CN/12/164 Appendix C. Page 112, Appendix 2.

implement has reduced the work of ploughing a hectare of land by at least 8 hours, that is, about 15 per cent. Unfortunately its use is not sufficiently widespread to influence the country's average productivity.

On the other hand, the improvement of the highway network and the widespread use of truck transport has had a considerable effect on increasing the farm labourer's productivity. At the end of the 'twenties the peasants were obliged (and still are in some isolated places) to transport the products of the owner's harvest to the city using their own animals, with the resultant loss of time. Now the majority of this transport is done by truck, leaving time to give better attention to the preparation of their own fields.

It is not possible to discuss yields, as the available information on this subject over several years cannot be compared. With average yields of 500 kilogrammes of wheat per hectare on the High Plateau and 750 in the valleys, productivity per man is only 1.04 and 1.56 kilogrammes, respectively, per hour of work. In other words, the production of a metric quintal of wheat requires about 100 man-hours on the High Plateau and only 66 in the valleys.

With regard to maize production, productivity per man improves considerably, due to the much higher yields of this grain. About 22 man-hours are required to produce a metric quintal of maize in the valleys, with an approximate yield of 1,500 kilogrammes. This figure rises to 32 for the same amount of grain in the eastern plains. The use of farm machinery in each region lowers the figures to 7 and 7.8 man-hours per metric quintal respectively.

In order to introduce some comparisons with other countries, Table 17 has been compiled, showing that despite the good yields of maize per hectare, productivity per man in Bolivia is small in comparison with that of other countries. As regards wheat, productivity per man is really discouraging.

/Table 17

Table 17 Bolivia: Productivity of the Farm Worker Compared With Other Countries

Classification	Bolivia		Mexico		Chile		U.S.A	
	M A I Z E							
	Valley	East	Guanajuato	Jalisco	O'Higgins	Average	Iowa	Average
Methods of work	Oxen	Manual	Oxen	Oxen	Tractor & oxen - irrigated	Mixed	Machinery	Mixed
Man-hours per hectare	325	288	311.4	274.3	326.3	406.8	40.8	67.5
Yield - metric quintals per hectare	15	14	8.4	7.96	22.43	14.4	29.41	17.81
Man-hours per metric quintal	22	32	35.5	39.4	15.0	28.2	1.4	3.8
	W H E A T							
	Valley	High Plateau	Ensenada Tijuana	Puebla Tlaxcala	Valdivia	Santiago	Kansas	Average
Methods of work	Oxen	Oxen	Mules - irrigated	Oxen - irrigated	Oxen	Tractors & oxen	Machines	Machines
Man-hours per hectare	310	489	116.2	257.0	249.2	121.4	11.4	21.5
Yield - metric quintals per hectare	5	7.5	8.0	4.84	149.3	16.94	9.14	10.21
Man-hours per metric quintal	97.8	66.5	14.7	52.5	16.7	7.2	1.24	2.9

Source: For Bolivia: unpublished surveys.
For Mexico, Chile and the United States: Document E/CN.12/164 Appendix C.

Two important conclusions are particularly notable in Table 17 viz:

1) There is a very broad margin indeed for improving the productivity of the farm labourer. Without having to invest capital, which is beyond the means of the small farmer, the number of man-days could be sharply reduced for the different crops by using cheap and easily handled implements like the rake and long-handled shovel, which would make tilling operations much easier; the scythe, which speeds up reaping and more skilled methods of threshing, or the use of small

/hand threshing

hand threshing machines or strippers. As regards soil preparation, the use of the mouldboard plough, small harrows, and mules or horses as draught animals would considerably help to accelerate the work.

2) Under the present systems of cultivation and the systems governing land tenure and labour, it is unlikely that there will be any increase in the area of the country under cultivation. The great number of working hours necessary for the preparation, cultivation and harvesting of any product, and the fact that the appropriate seasons for carrying out these tasks are too short, limit the peasant's working capacity, thus affecting the area which he can cultivate for the proprietor, and more still the amount he can cultivate for himself.

In the High Plateau region, a peasant with his assistant, using primitive methods and ordinary implements, requires 14 eight-hour days (28 between the two of them) for the adequate preparation of one hectare of land (breaking, two-cross ploughings with oxen and a wooden plough, and manual clod breaking with the help of mallets) for sowing wheat, barley, quinua, and a little more for sowing potatoes. Nevertheless, according to the traditional customs of the region, the real work of a farm labourer and his yoke of oxen in this type of cultivation does not exceed six hours a day (due to the poor feeding and to the reduced strength of the oxen); consequently the good preparation of one hectare for sowing requires approximately 18 man days. To this must be added the fact that under existing laws, four days a week are worked on the proprietor's lands, so that the peasant has only three days available for cultivating his own land. Assuming that under these conditions the proprietors take advantage of the maximum capacity of their labourers, this would ensure them a given number of hectares per peasant which would seldom exceed three per year, due to the short season available for this class of work. As regards the peasant, his position is difficult because the time in which he can work his own land would not allow him to cultivate more than two hectares, as first, the thorough preparation of one of them would require about seven weeks of three days each. In practice the position is different because the peasant works his land very imperfectly, using a minimum of man-hours; therefore the yields are also lower.

This explains why, particularly in the High Plateau region, such long rotations are adopted, leaving great areas lying fallow. It also explains

/the very

the very low living standards of the peasant, because the limited area which he can cultivate gives him a very small "wage" and also a very hazardous one, as weather accidents reduce his harvests to practically nothing.

The position in the other farming regions of the country is not so difficult from the point of view of productivity and the compensation which the peasant receives for his work, but there are other limitations. In the principal valleys, the capacity and efficiency of the worker are decreased by the shortage of land and the small sizes of the cultivated units. In the eastern plains, the problem lies in the large number of man-hours required to obtain a harvest, and the excessive physical effort which this entails, as there is no assistance from draught animals.

3) An improvement in yields could increase the farm labourer's productivity considerably. As already indicated, the use of the most elementary principles of agricultural science, the growing of varieties more suited to climatic and soil conditions, and improved seed selection could result in more assured and abundant harvest with the same labour output.

Should any change be introduced in the systems of remuneration of labour, without the previous improvement of technical and economic farming conditions, the wages received by the rural workers would necessarily have to be low because, apart from a low physical output per unit of human and animal labour, the value of the product is generally very small, due to the low level of prices paid to the producer.

Transport and Agriculture

Communication routes and transport systems in Bolivia have not helped to speed up the country's agricultural development. The country's railways, in their great majority, were constructed to export mining products and only a few - those built more recently - link the great consumer centres with those of agricultural production. The building of highways was also greater in the more populated regions to the west and south of the country. While some important producing centres were linked with these, their extent and quality were insufficient to extend the farming frontier and to facilitate the movement of the population within the country.

The difficulties due to the country's topography, the great distances, the relative isolation of the farming regions and the high cost of construction, has retarded the expansion of the highway and railway communications within the country and the improvement of those already in existence.

/In 1948,

In 1948, Bolivia had 2,756 kilometres of railways and 24 816 kilometres of highways. Of these, only between 10 and 15 per cent (about 3,000 kilometres) corresponded to highways for permanent traffic with some kind of reinforcement. The rest were dirt roads, which can only be used by wheeled traffic during dry periods. In both cases, however, transport is difficult and very costly, to the extent of being prohibitive for many farming products.

There are still potentially very rich and extensive farming regions which are practically isolated from the rest of the country. The eastern plains provide the best example of the influence which the lack of suitable communications may have on the stagnation of a region's economic development. There are large areas of rich land in that region which could produce all the sugar, rice, cotton, maize, oilseeds, hard fibres, timbers and meat required by Bolivia, as well as a considerable surplus for export. The highways connecting these regions with the rest of the country are dirt roads, with no reinforcement, and they can only be used during dry periods. The general condition of these highways is bad, and as a result, the wear on the vehicles and the costs of transport are very high, so that it is only possible to trade in non-perishable products with a high commercial value, such as alcohol, hides, fine timbers and, recently, rice.

The lack of suitable highways has therefore meant that the whole of this region's agriculture remains at an almost primitive level. The high freight rates and the difficulties of the journey limit the markets, and consequently demand is scanty and the prices received by the farmer are low for the majority of local products. There is therefore very little incentive to expand the areas under cultivation and intensify farming. However, in spite of these drawbacks, a strong progressive movement has commenced during the last decade in the Santa Cruz region, which reached greater intensity in view of the prospects for the relatively rapid completion of the asphalt road to Cochabamba and the Railway to Corumba (Brazil).

There are other regions similar to the eastern plains, which are completely isolated due to their distance from consumer centres and the poor condition of the roads - when these exist. Over 50 per cent of the national territory may be taken as removed from the economic life of the country.

/Within the

Within the region best served by the national departmental and local highway network, there are sectors which in spite of being relatively close to the consuming centres and of enjoying good conditions for farming, are considered marginal, because the high freight rates prevent their products from being taken to the markets. Such conditions frequently occur in the mountainous region where, in spite of the fact that there are fairly important trunk roads, there are other factors which have a strong influence increasing the tariffs. At times these are due to the bad condition of the highway and the hilly terrain, both these conditions causing heavy wear on machines with the resultant high rates of depreciation; in others, the lack of local roads made it necessary to use beasts of burden, at least as far as the road, with the consequent damage, delays and additions to the cost.

Policy of Prices

There are no statistics available permitting a detailed study of the prices paid to the farmer and of the influence of these prices on agricultural progress. Certain conclusions may, however, be drawn from factors which are directly or indirectly related to these prices.

In general terms, it may be stated that the prices paid to the farmer have not risen in the same proportion as the general level of prices and that as a result, he has not had sufficient incentive to increase his production.

On the basis of the cost-of-living index prepared by the Banco Central, it may be observed that the sector corresponding to foodstuffs has remained lower in almost every year and for the majority of cities, than the general index and the partial indices of fuel, clothing and housing.

Taking this index separately and comparing it with the index of food prices and that for imported raw materials for food, it may be seen that the second has risen in much higher proportion than the first. Thus, while the cost-of-living index in the foodstuffs sector (32 commodities) for the city of La Paz rose to 2,611 in 1949 - base 1931 = 100 -, the index of prices of imported foodstuffs (48 commodities) rose in the same year, as against the same base, to 4,210.[1/] Bearing in mind that a considerable part of the components of the index of foodstuffs is imported,

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1/ This index refers to c.i.f. prices at port of destination, and therefore is much lower than the retail prices, as it does not take into account transport costs to the consumer centre, commissions of importers and intermediaries, losses, depreciations etc.

/it will

it will be seen that products of domestic origin have risen in very much lower proportion than imported ones. Remembering, also, that the cost-of-living index is always calculated on the basis of retail prices in the principal cities, it may be assumed that, due to the numerous stages through which the farm product has to pass in the process of distribution, the prices received by the farmer have also risen in much lower proportion than that indicated by the index of the cost of foodstuffs. Within the prevailing systems of distribution in Bolivia, the producer is practically forced to accept the ruling of the middleman. On the other hand, the commercial producer has to meet the competition of the small indegenous peasant, who does not take into account either his labour or time; he takes his products to the markets and sells them personally, without adding the cost of transport or the value of his time to his prices.

The prices received by the farmer are even more diminished by the high freight rates which he has to pay. Since the beginning of the Bolivian inflationary process in 1952, both the National Government, as well as local or municipal authorities have tried to control the prices of essential commodities, and in particular, of foodstuffs. Ceiling prices were set for this purpose, but these were always fixed arbitrarily, without taking into account the market conditions or production costs, and by means of simple decrees which did not seek ways of regulating the mechanism of the market. 1/

On the other hand, in years of plenty, the supply exceeds demand and prices fall to abnormal levels, without any measures being taken to prevent this.

Such sharp price falls have in many cases caused the loss of considerable quantities of products on the farms themselves, because the

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1/ Information from the Ministry of Agriculture indicates that only in the case of price controls for fresh milk were production costs taken into account, in the case of meat, the distribution cost was calculated but not that of production.

2/ The narrow market margins, the lack of distribution systems and high freights, all contribute to make these situations frequent and to make it impossible to remedy them by taking the products to other markets within the country or abroad.

/market prices

market prices were insufficient to cover the freight costs. Perishable and semi-perishable products (vegetables, potatoes, fruits etc.) are most affected under these conditions.

As a result of these limitations, the relative position of the farmer has deteriorated. While the index of the cost of foodstuffs to the consumer rose to an average of 2,229 (Base 1931 = 100) for the five-year period 1945-1949, the index of the cost of clothing (8 articles) rose, during the same period, to 3,142; that for prices of imported machinery and implements 2/ rose to 2,494, and for fuel costs, to 2,508.

These comparisons show that the farmer's position is scarcely promising, as his profits are limited and are possibly lower than those of any other activity within the country. Such conditions are scarcely conducive to any change in the agricultural producer's attitude, as the economic incentive is very small and the risks he runs in investing his capital are very great.

Policy of Artificial Prices

Bolivia is obliged to import each year considerable quantities of foodstuffs and agricultural raw materials to meet the requirements of domestic consumption. One of the main factors which prevent the country from producing this deficit has undoubtedly been the competition of the imported product and the facilities given for bringing it into the country. Until the final decade of the last century, when construction was completed of the first railway linking the city of Oruro with the Port of Antofagasta on the Pacific Coast, Bolivia produced almost all its foodstuffs, including wheat, sugar, rice and meat. The railway connecting the country with the outside world permitted the introduction of growing quantities of better quality foodstuffs, at much lower prices than those in force until that time, so that part of domestic production, particularly that coming from the eastern region, was rapidly displaced. The abundance of foreign exchange derived from the sale of minerals meant that there was no hindrance to this trade. After the Chaco War, the devaluation of the currency and the growing shortage of means of payment had a marked effect on imports. Exchange control and the granting of exchange for imports of food and raw materials at preferential rates prevented a sharp increase in prices. This trend became sharper as the boliviano was devalued, to the extent that in 1949, exchange was granted for the import of essential goods

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1/ This index refers to prices f.o.b. port of shipment, so that it may be assumed that prices to the consumer have risen to even higher levels.

42.42 bolivianos per dollar, while the black market exchange varied at that time between 90 and 115 bolivianos per dollar.

Under this policy, an official subsidy on imports was maintained, creating a completely artificial situation, so that certain imported products were quoted in Bolivia at lower rates than in the producing countries themselves. Several recent examples may be used to provide a better illustration of the situation. In the month of May 1950, the boliviano was devalued, and two exchange rates were introduced: an official rate of 60 bolivianos per dollar and another "free" rate of 100 bolivianos per dollar. On the black market, the dollar was quoted after devaluation at about 170 bolivianos. In June, sugar was quoted c.i.f. Mollendo at 5.90 dollars per quintal of 100 pounds; rice c.i.f. Antofagasta at a price of 6.20 dollars for a similar measure. At the official rate of 60 bolivianos granted for the import of these goods, the price in bolivianos was 354 and 372 respectively. The price to the consumer in the city of La Paz, after adding freights, commissions and overprices designed to foster wheat production, were fixed by the Ministerio de Economía at 530 bolivianos and 525 bolivianos respectively. Taking into account the total transactions in foreign currency, the real exchange for the boliviano varied, possibly at around 110 and 120 bolivianos per dollar. Applying the average of these exchange rates to the prices set by the Ministerio de Economía, the result would be even without deducting the margin of "revertibles" (Government earnings in the sale of other products, used as subsidies), that the price in La Paz was 4.60 dollars per quintal of sugar and 4.56 dollars for rice, these prices being much lower than those quoted in the ports of access to Bolivia. Very similar and even worse situations arose as regards wool, cotton, condensed milks, barley, meats etc., because the prices for these products were not surcharged in order to obtain "revertibles".

The fixing of artificially low prices has serious consequences for the national economy because, on the one hand, they are so much lower in some neighbouring countries, that the clandestine re-export of imported products is encouraged, together with contraband of national products (coffee, wool, textiles etc.), and on the other hand, foreign commodities compete favourably with those produced locally.

This latter situation and the sparse Government technical assistance has undoubtedly contributed towards even greater retarding of agricultural development. The low prices fixed through the use of multiple exchange

/rates for

rates for imported commodities of prime necessity runs counter to the interests of the domestic producer, discouraging him from making a greater investment and intensifying production. As a result, this policy has helped to stagnate farming progress, preventing production from maintaining a growth similar to the increase in the population and its greater demand. In some cases, it has contributed to the reduction of some crops (coffee) while in others it has meant that some products are used in a way which is against the national interest - the manufacture of cane alcohol instead of sugar.

Any consideration of the competition which the domestic product has to meet should bear in mind that foodstuffs and agricultural raw materials which are imported into the country come from countries which are specialized and efficient producers, whose costs permit them to compete on the world market. It is impossible, therefore, to conceive that the Bolivian farmers, with difficulties of all kinds, particularly technical ones and transport problems (high freights), could produce and sell at lower prices than those ruling on the world market. It is possible that because of the low level of wages, the cost of labour is less than in other countries, but it has already been proved elsewhere in this study that the productivity per man is usually much lower in Bolivia and that the organization of production is essentially inefficient. It may well be, therefore, that a calculation of comparative costs would not show any great advantages for Bolivia.

Returning to the case of rice and sugar, it was found that the price of these products in June 1950 in the city of La Paz had been 7.00 dollars and 6.50 dollars respectively (c.i.f. value plus transport from the port of access to the consumer market, and commissions), that is, that at the real exchange of 115 bolivianos per dollar, rice would be 805 bolivianos and sugar 746.50 (without surcharges for "revertibles") instead of 525 and 530 bolivianos, which were the prices fixed by the Ministerio de Economía, with a view to the immediate and very understandable need of ensuring that prices to the consumer were not too high.

In the case of coffee, while a quintal of 100 pounds was quoted at 42.13 dollars in Santos Brazil, that is, over 4,800 bolivianos at the real exchange and 2,427.80 bolivianos at the official rate of 60 bolivianos per dollar, in the city of La Paz the price was fixed at 1,200 bolivianos, in spite of the fact that production in the main coffee region of the country had been reduced, due to adverse weather conditions, to under

/40 per cent

40 per cent of the normal figure.

Subsidy Prices

Increased production of wheat, a basic component of the urban diet of Bolivia, was always the principal objective of the Government's policy of fostering agriculture. In 1929, one of the first laws was drafted, designed to favour domestic production of this cereal and, among other measures, a small tax was introduced for imports of foreign wheat and flour. Later, both the import of flour and milling of it were burdened with new taxes and these funds were assigned to fostering wheat production and to irrigation works. Moreover, the Junta de Fomento Trigüero was created, designed to increase cultivation by means of the irrigation works and the improvement of production methods. These measures, however, did not have the desired effect, as production remained stationary and imports of both wheat and flour continued to increase.1/

In 1941, the first Decree was drafted fixing guaranteed prices for the domestic product, granting 45 per cent premium over the prices in force until then. First class wheat reached a quotation of 123.25 bolivianos for a quintal of 100 pounds. Later this price was reduced to 120 bolivianos.

These measures did not have any marked effect on production, as domestic grain had to meet competition from maize which, being a more hardy plant with higher yields, was preferred by the valley farmers.

After 1946, in view of the enormous increase which wheat had experienced in the world market and the difficulties which were being encountered for the normal supply of the country's requirements, a policy was initiated of subsidy prices which in two stages lifted the price of this cereal by 179 per cent in relation to that fixed in 1941. Lesser increases were determined for other grains (quinua, barley and rye), where an increase in production was desired.

The results of these decrees only became evident in the harvests of 1948 and 1949, as purchases of domestic wheat by the millers throughout the country increased by 120 per cent in 1948 and 276 per cent in 1949, in relation to the five-year period 1943-47. Finally, in spite of the serious difficulties which have to be overcome by wheat growers, particularly as regards cryptogamous diseases and low yields, it had proved possible to raise the price to a level where it displaced maize and barley over considerable areas, and it was also sown in the irrigated lands of the Cochabamba valley. There is no doubt that the development activities of the technical sections of the Ministry of Agriculture partly contributed towards improving production.

1/ Under the 1929 law, which placed a progressive tax on wheat imports, the only achievement was to protect the domestic milling industry, as the result of this was that imports of flour in two years fell by over 86 per cent, while those for wheat increased by more than 2,885 per cent in a period of three years, rising from 737 tons in 1929 to 22,011 in 1932.

/The fixing

The fixing of subsidy prices for domestic wheat at levels similar to those on the world market, considering the fine par value, as well as the import of the balance of consumer requirements at the preferential rate, forced the Government to create a compensation fund in order to prevent a rise in the price of bread. For this purpose, advantage was taken of the fall in imported sugar experienced at the end of 1947. The Government, as the sole importer of this product, kept prices at practically the same level as the average for that year, and used the difference of about 100 bolivianos per quintal (after deducting commissions, expenses etc.) for the payment of the overprice. This fund was also increased by the proceeds from a 15 per cent tax on commercial profits from imported goods. The purchase of 12,100 tons of domestic wheat in 1948 signified for the Government the payment of 25.8 million bolivianos with the object of keeping the price of bread stable.

The guarantee prices fixed for other commodities did not produce the same result as with wheat. Only quinua experienced increases of some importance in the area cultivated. Barley and rye, on the contrary, seem to have lost ground to wheat, as the price of this was not only at a higher level but rose in much greater proportion.

Agricultural Credit

The commonest feature of the vast majority of farming in Bolivia has been the moderate investment of both fixed and working capital. Until the middle of the 'thirties there were few landowners who had invested any important sums in improvements and the increased use of technical methods in the agricultural industry. The vast majority of proprietors of farming estates continued using the methods inherited from colonial times, that is, workers remunerated with the use of the land, primitive home-made implements and unselected seeds, generally produced on the farm itself. Rural buildings were poor, and were almost always built by the peasants themselves; only in some regions was the proprietor accustomed to purchasing draught animals, as in others, these animals and the tilling implements were supplied by the peasants as part of their obligation. Livestock were usually of the creole type, born and bred on the same properties. As a general rule, the only outlay entailed in working a farm was the payment of a foreman, who received a very small wage.

Under these conditions, it was difficult to consider farming as a business; it was rather a kind of patriarchal exploitation, in which rural property was considered as a means of producing a small supplementary

/income for

income for the proprietors, who were mostly absentees, their main activity being outside agriculture. Those persons whose income was derived exclusively from the land, had to possess large areas of land, either in one or several properties, in order to receive an income which would allow them to maintain a standard of living comparable to that of the upper middle classes in more advanced countries. Briefly, under the working conditions described, farming was not considered a lucrative investment and only in very rare and exceptional cases did it permit the formation of savings.

When these were accumulated, they were either invested outside agriculture or in the purchase of new rural properties, but very seldom in the intensification and improvement of agricultural activities.

At the end of the 'thirties a few farmers began what may be termed the principle of slow evolution of Bolivian agriculture. This interest in the development of farming activities was shown by the increased imports of agricultural machinery, seeds, fertilizers on a very small scale, thoroughbred animals for stud purposes, and greater investments in rural buildings. Also, partly due to the pressure of these farmers, the Ministry of Agriculture was organized, succeeding, in spite of its sparse economic resources, in creating a favourable atmosphere for the intensification of agricultural activities.

This goodwill towards agriculture could not make much progress due to the shortage of capital; there were no agriculture savings and the commercial banks laid down onerous conditions for the loan of funds for this purpose; the amortization periods were very short, interest rates very high and collateral requirements excessively so. These banking institutions were also somewhat cautious and lacking in confidence as regards agricultural activities.

In view of the impossibility of obtaining capital for the development of agriculture, some landowners managed to persuade the Government, in February 1940, to entrust the Banco Central de Bolivia with the organization of a Department of Rural Credit with a capital of 30 million bolivianos. This department commenced its activities in the second half of that year, granting crop for livestock loans (purchase of seeds, fattening of cattle etc.), with amortization periods of one year for the first and up to three years for the second; improvement loans for the purchase of farming machinery and stud animals, and draught animals, were granted with periods up to five years, and finally, real estate improvement loans were

/granted for

granted for buildings, fences, irrigation works etc., with periods of up to seven years.

All the loans paid an interest of 6 per cent per annum, and as a general rule they were granted with mortgage guarantees up to 50 per cent of the commercial value of the mortgaged property being lent. The investment of credits was strictly controlled by the Bank through its technical personnel through periodic visits to the properties concerned.

The interest which existed in agricultural activities could be noted by the rapid depletion of the Department's capital. In April 1942, the 30 million bolivianos had already been loaned, and by 27 July, when its functions ended, it had received requests for loans to a total of almost 55 million bolivianos. The Department's activities were therefore limited exclusively to operations with the funds which returned to it in the form of amortizations on loans already effected.

In this first stage of specialized agricultural credit, the greater part of the loans were set aside for the purchase of farming machinery and stud animals. By means of this assistance, imports of farming machinery and implements increased sharply. (The quantum index for these imports rose by 71.5 per cent in 1941 in relation to 1950.)

The strong demand for credits, the shortage of capital and the difficulties which from the beginning were observed both in the methods of operation and in the conditions required, showed the need to expand credit assistance to agriculture. For this purpose, the Government in February 1942 decreed the creation of the Banco Agrícola de Bolivia, with an authorized capital of 200 million bolivianos and a paid-up capital of 50 million bolivianos. To form the second item, the Government contributed 20 million bolivianos in cash, and the remaining 30 million were contributed by the Banco Central de Bolivia in the form of credits granted by its Departamento de Crédito Rural.

The Banco Agrícola was to continue the operations of the Departamento de Crédito Rural of the Banco Central on a somewhat larger scale and moreover, to undertake certain activities for fostering agriculture. These included the organization of public auction markets for agricultural and industrial products, in order to eliminate middlemen and regulate prices; the purchase of agricultural raw materials and of products in the course of processing, for distribution to industries in general; the import of seeds, fertilizers, chemical substances, thoroughbred animals, raw materials,

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machinery and implements for agricultural purposes etc.

The Bank began its activities in the city of La Paz in July 1942 and its activities were soon expanded, agencies being founded in all the capitals of the Republic and in some of the principal farming regions.

The requests for credits presented to the new institution continued to be very much higher than its small capital could meet, in spite of the fact that this was increasing annually after 1945, by means of a loan of 60.9 million bolivianos granted by the Corporación Boliviana de Fomento, various contributions from the Government, and the profits of the Bank itself. On 31 December 1950, its capital had risen to 166.3 million bolivianos and its reserves to 44.4 million bolivianos.

In spite of these capital increases, the Bank was never able to meet the limited requests for credits from the farmers. In 1947 it granted 74 per cent of the total requests presented to it, but in 1946 it only succeeded in meeting 45.4 per cent. On an average, from its inception until 1948, the Bank granted credits which only amounted to 59 per cent of the total of the requests. (See Table 18.)

Table 18 Bolivia: Capital, Loans Requested and Loans Granted by the Banco Agrícola de Bolivia, and Loans Used by the Farmers

1942 - 1948

Years	Total Capital	Loans Requested	Loans Authorized	% of Loans authorized over Requests	Loans Used	Loans Owed
1942	50.0	83.8	49.9	59.5	41.8	32.1
1943	50.6	62.0	41.3	66.5	37.4	51.1
1944	54.9	44.5	25.5	57.3	32.4	55.5
1945	111.4	108.4	62.9	57.9	63.1	81.6
1946	132.9	135.7	61.6	45.4	58.4	96.5
1947	151.9	96.3	71.7	74.0	64.9	117.3
1948	175.5	80.2	47.9	59.6	52.9	114.3
1949	210.6	79.6	37.5	47.1	38.5	105.8
Totals	940.8	690.5	398.3	59.0	389.4	

Source: Memoria of the Banco Agrícola de Bolivia, 1949.

The figures noted in the preceding table, however, present a situation which does not agree with the real problem. The value of the loans requested from the Banco Agrícola were really only a small part of the real credit needs of the farmers, as many of these knowing the small extent of

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the Bank's capital and the time which sometimes elapses before a loan is obtained, did not make requests. Others did not have sufficient collateral to meet the Bank's severe requirements, and the majority were entirely ignorant of the existence and uses of credit.

From the beginning, lack of capital has been the Bank's main obstacle preventing the efficient fulfilment of the task entrusted to it. The small sums placed at its disposal only served to meet a little over half of the requests and to give an initial stimulus of positive value, to agricultural development. Judging by the data published in the Bank's annual reports, it is probable that in the ten years which have elapsed between the introduction of agricultural credit into Bolivia until the end of 1949, loans were not granted to more than 7 or 8 thousand proprietors.[1/] As the total number of farm properties in the country exceeds 150,000, it will be seen that the benefits of credit have only reached about 5 per cent of them.

As the value of agricultural production in the country was calculated, in a preliminary manner, at 2,400 million bolivianos[2/] in 1940, it will be seen that the initial capital of 30 million bolivianos for agricultural credit purposes was extremely small to finance any sector of production, no matter how small and specific. Taking as an example the year 1946, the last year covering calculations on the value of domestic production, the situation appears to have been even worse, because for agricultural production estimated at a total value of approximately 6,053 million bolivianos, only a capital of 108.8 million bolivianos was available and new loans were only granted for 61.6 million bolivianos. Therefore in that year, only about 2 per cent of the value of production was financed by means of development credits. In later years, this situation deteriorated considerably, as the Bank's capital did not increase in relation to the possible increases in production, and less in relation to increases in its value, at current prices, caused by the strong inflationary pressure.

No figures are available corresponding to either banking or private commercial credits granted to agriculture, but it is known that these were not of great importance in agricultural development. The use of such credits is practically unknown in the country, both because of the lack of confidence which exists as regards agriculture, and because of the over-onerous conditions demanded by the lending institutions or persons.

1/ The total number of loans was possibly greater, but many proprietors have received two or more credits.

2/ Estimated calculation by the Banco Central.

The Bank's shortage of capital has discouraged the farmers in their desire to obtain credit. This discouragement may be noted clearly in the way in which requests declined after 1946. In that year loans were requested for 135.7 million bolivianos; in 1948, this figure dropped to 80.2 million bolivianos, only 48 million having been authorized. In 1949, requests rose to 79.6 million, but loans were granted only to a value of 37.5 million.

In 1948, a proposal was studied for founding the Banco de Fomento de la Producción for the purpose of developing both agricultural and industrial production. This Bank was to have an authorized capital of 1,000 million bolivianos and a paid-up capital of 500 million, composed of the Government's contributions, the Banco Central, the Banco Agrícola and the Corporación Boliviana de Fomento. Difficulties of various natures, particularly financing, prevented the creation of this institution.

In its Report for 1945, the Banco Agrícola estimated that purely for the partial mechanization of agricultural activities, a minimum of 1,000 million bolivianos would be required. As the agricultural development of a country does not depend exclusively on the direct assistance to farmers, but also requires heavy investments on the part of the Government in highways, irrigation works, colonization, organization of markets etc., this would imply that Bolivia would need at least double that figure to plan itself on a self-sufficient basis and to unify its agricultural regions and markets.

In general, the Banco Agrícola has confined itself to granting improvement loans at terms of about five years, for the purchase of machinery, breeding animals, improvements and for perennial crops. It also grants some crop and livestock loans with amortization periods varying between one and three years. However, due to the customs of Bolivian agriculture and the risks implied, the Bank prefers not to conduct this type of operation. On the other hand, many of these short-term loans are converted into fairly long-term credits, as in the majority of cases it is necessary to grant renewals.

Loans with amortization periods exceeding five years and up to a maximum of fifteen, have been granted on a much smaller scale than the others, due to the capital limitations of the Bank, but as the investments to which these loans are directed are important, their value within the whole is of some significance.

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Of the total loans granted, about 80 per cent were assigned directly or indirectly to agricultural production; 14 per cent to animal husbandry and the rest to associated industries. During recent years, there has been greater interest in stock breeding, particularly sheep, on the High Plateau, and cattle, for the production of milk, near the large consuming centres and in the valleys.

The Banco Agrícola has not followed a defined policy regarding the direction of its credits and has had to adjust itself to the mentality of the farmers and the agricultural atmosphere. "In Bolivia, it would be impossible to foster the production of a given product more or less exclusively, without running the risk of arousing serious discord both of a political and a regional nature; that is why the Bank has granted loans in a vague manner for the cultivation of all kinds of products. However, in certain cases preference has been given to larger credits for farmers who are particularly interested in intensifying the cultivation of products important to the national economy, such cotton, sugar, rice, etc."[1/]

1/ Statements by the Manager of the Banco Agrícola to a member of the Mixed Working Group ECLA/FAO, 29 November 1948.