RURAL BRAZIL AT THE CROSS-ROADS

H. MEIJER

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Dit proefschrift met stellingen van

HENDRIK MEIJER

landbouwkundig ingenieur,
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is goedgekeurd door de promotor
Dr E. W. HOFSTEE, Hoogleraar in de economische
en sociale geografie en de sociale statistiek

De Rector-Magnificus der Landbouwhogeschool
A. KRUIDHOF

Wageningen, 7 November 1951

STELLINGEN

I

In subtropische gebieden is het opnemen in het bouwplan van veel materiaal leverende groenbemesters doorgaans een noodzakelijke cultuurwijze.

II

Het valt te betwijfelen of de kruidenteelt in Nederland in sterke mate zal kunnen bijdragen aan de oplossing van het zogenaamde „kleine boeren" vraagstuk.

III

Het bestuderen van cultuurmogelijkheden voor diverse Braziliaanse palmspecies welke potentieel voor commerciële doeleinden in aanmerking zouden kunnen komen, moet van belang worden geacht voor verscheidene tropische gebieden.

IV

Bij het verspreiden in het buitenland van wetenschappelijke publicaties betreffende phytopathologische onderwerpen, mogen de commerciële belangen van het eigen land niet uit het oog worden verloren.

V

Bij uitgeputte in lateritische richting verweerde gronden is doorgaans gemakkelijker recuperatie te bereiken dan bij gronden van het podsoltype.

VI

De opvatting van WAKSMAN en STARKEY [1]), als zou de sterke vermeerdering van het totale aantal micro-organismen in partieel gesteriliseerde gronden uitsluitend het gevolg zijn van het beschikbaar komen van door de behandeling ontsloten voedingsstoffen, is door de onderzoekingen van A. GERHARD WINTER [2]) onbevredigend gebleken.

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[1]) The soil and the microbes, 1947.

[2]) Archiv für Mikrobiologie, Bd 16, blz. 136–162, 1951.

Diss. H. Meijer, Wageningen, 1951

VII

Indien geen restrictieve maatregelen zouden worden genomen moet een zodanige uitbreiding der Braziliaanse koffiecultuur worden verwacht, dat een sterke prijsval onvermijdelijk zal zijn.

VIII

Het moderne open potstalsysteem behoeft geen nadelige invloed uit te oefenen op de kwaliteit van de melk, indien elementaire hygiënische voorzorgen worden getroffen en het melken in een aparte stal plaats heeft.

RURAL BRAZIL AT THE CROSS-ROADS

PROEFSCHRIFT

TER VERKRIJGING VAN DE GRAAD VAN DOCTOR
IN DE LANDBOUWKUNDE
OP GEZAG VAN DE RECTOR-MAGNIFICUS A. KRUIDHOF,
HOOGLERAAR IN HET LANDMETEN EN WATERPASSEN,
TE VERDEDIGEN TEGEN DE BEDENKINGEN
VAN EEN COMMISSIE UIT DE SENAAT
VAN DE LANDBOUWHOGESCHOOL TE WAGENINGEN
OP VRIJDAG 7 DECEMBER 1951 TE 16 UUR

DOOR

HENDRIK MEIJER

ISN: 104455

H. VEENMAN & ZONEN · WAGENINGEN

„Hominum generi universo cultura agrorum est salutaris"

(CICERO, CATO MAIOR DE SENECTUTE 56)

Aan mijn Moeder

Aan mijn Vrouw

Bij de definitieve afsluiting van mijn studie aan de Landbouwhogeschool is het mij een behoefte mijn dank te betuigen aan U, oud-hoogleraren en hoogleraren voor het onderricht, dat ik van U mocht ontvangen.

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Ás autoridades Brasileiras, desde o Senhor Ministro da Agricultura, até os Senhores empregados das várias divisões estatísticas, aos funcionários dos diversos institutos autônomos e, enfim ao povo Brasileiro inteiro quero expressar a minha gratidão pela gentileza de me fornecerem todos os dados necessários para poder escrever êste estudo, e pela amizade que gozei e que me penetrou na coração.

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INTRODUCTION

The aim of this study is to try to detect the possibility for a change in rural Brazil which the student thinks might take place in the second half of this century, together with some of its probable consequences.

To reach this aim it is necessary to study aspects of rural Brazil in the past and in modern times. Therefore, in Part I an attempt will be made to give an impression of rural Brazil in general, against the background of some characteristics of the country and its inhabitants.

The rural production system generally was, and still largely is, a one-sided affair in Brazil: the producer wants to harvest without giving back anything to the soil. This method of production was possible thanks to immense reserves of virginal land within an area with some possibilities of delivering the goods to the markets. In some regions these possibilities were limited, and the producers had all the disadvantages of the 'long distance' from the market. Nevertheless, production was possible.

This agricultural system, however, led to a shifting of production centres further and further away from the market and, therefore, the transportation costs increased, with every move. Because of the fact that there is an absolute limit for the 'distance' from the market, varying with the value of the product, beyond which production on an economic basis is impossible for the product in focus, the general rural situation worsened steadily.

It seems, that around the middle of the twentieth century the very limit for various products has been reached prohibiting their production for the big markets in the traditional way. Nowadays there are no large areas of high productive virgin lands within

500 km from the big centres of consumption, Rio de Janeiro and São Paulo. Prices for transport from those high productive regions which were recently opened up, are prohibitive for all products but coffee.

It may seem incredible, that the sparse population of Brazil has been the cause of the loss of natural production capacity in immense parts of Brazilian territory. Nevertheless this occurred, the same as it happened in other parts of the world. It should be borne in mind, that social and economic factors have been the main reasons why the afore mentioned methods had to be used. A change in the social and economic factors may result in a change in production methods. The latter even might prove to be a necessity.

With Part I as a basis, Part II explains further,

- why it is thought a change has to take place;
- along which lines it could be stimulated;
- some of the natural stimulating and hampering factors;
- what final rural configuration is thought the most probable and the most advantageous for the country, and
- its most important probable consequences.

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PART I: *Rural Brazil in the first half of this century*

PART II: *A way ahead for rural Brazil*

[1]) Agriculture in its broader sence.

Part I

RURAL BRAZIL IN THE FIRST HALF OF THIS CENTURY

CHAPTER I

SOME FACTS ABOUT BRAZIL

Although most of the facts concerning Brazil listed in this chapter may be known, it is necessary to mention them, in order to prevent misunderstandig.

Geography

Brazil – the United States of Brazil – is the largest political unit of the South American continent. It covers about $^3/_7$ of this continent, 8,516,037 km², an area somewhat larger than the U.S.A., including Alaska, and 65 times the size of England.

The present day bounderies of Brazil are a result of a long series of treaties concluded between Brazil and her many neighbours (all the South American republics and colonies with the exception of Chile and Ecuador) from 1443 up to 1907.

Brazil may be divided into two major physical parts: the lowlands, i.e. the Amazon basin which covers the States of Amazonas and Pará (with an area of 2,812,544 km² almost one third of Brazil) with an altitude of less that 250 m; and the Brazilian plateau, which is roughly the rest of the republic, save for a narrow coastal plain. As to the La Plata basin it could be considered as a part of the lowlands, but as the Brazilian part of it has a fairly high altitude, it is as well to include it in the plateau.

The Amazon basin is the most humid region of Brazil. Large parts of it are flooded every year. It is the most vast expanse of tropical forest in the world, and has, so far, been of very little economic importance.

The Brazilian plateau consists of a rolling elevated tableland some 300 m to 1,000 m above sea level, traversed by a number of comparatively low mountain ranges. The range which has been and still remains of great importance to the development of Brazil is the 'Serra do Mar', or coastal range. As seen from the ocean, it appears as a practically unbroken chain of mountains; in reality however, it is only the eastern border of the plateau which has a slightly higher elevation than the rest. Its importance is a negative one, because from the earliest times to the present day it has formed a barrier to the economic penetration of large and potentially important parts of the interior.

The coastal plain extends from Cape São Roque in the North to Rio Grande do Sul in the South. It is narrow in the North, disappears in some parts, where the Serra do Mar rises directly from the Atlantic, but widens in the extreme South, and is merged into an extensive, slightly rolling plain.

Rivers in Brazil may be grouped into two great systems, three or four rivers outside these two systems and numerous small streams. The two great systems are those of the Amazon and of the River Plate. The Amazon system, which is of great interest from some points of view, is of little importance in this study, as it drains an area which is of hardly any importance to present day Brazilian economy.

The system of River Plate (Rio de La Plata) is of far greater importance. The Rio Uruguay, the Rio Paraná and the Rio Paraguay form part of the Brazilian border in the South West and have Brazilian sections as well. The Paraguay flows for 880 miles in Mato Grosso, of which 600 miles are navigable. A third of the total length (2,800 miles) of the Paraná drains southwestern Minas Gerais, the bigger part of São Paulo and Paraná States; parts of the southern areas of Goiás and Mato Grosso, too, belong to its basin. Large parts of it, above and below the 'Sete Quedas' (Seven Falls) are navigable. The Uruguay drains south Santa Catarina and northern Rio Grande do Sul but is not navigable.

Among the rivers flowing to the ocean from the great plateau should be mentioned: Rio Paraíba, Rio São Francisco, Rio Jequitinhonha, Rio Doce and Rio Paraíba do Sul.

The only three harbours on the 3,642 miles long coast of Brazil suitable for all kinds of vessels are Rio de Janeiro, (Guanabara Bay), Santos and Bahia. Other harbours of importance for both transatlantic and coastal transport, but with a depth not suitable for the largest ships, are: Belém, Fortaleza (with lighters), Natal, Cabedelo, Recife, Maceió, Ilhéus, Vitória, Angra dos Reis, Paranaguá, Antonia, São Francisco, Itajaí, Rio Grande, and Porto Alegre.

For coasters there are still numerous harbours such as: São Luiz, Tutóis, Luiz Correia, Camocim, Aracatí, Aracajú, Imbituba, Iaguna and Pelotas.

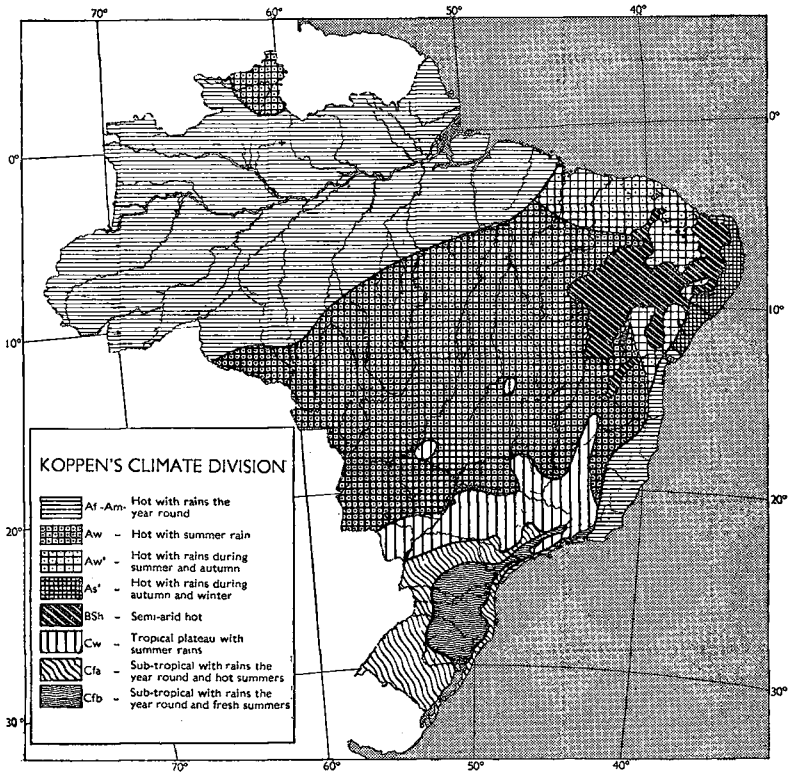
Finally the port of Manáus should be mentioned, although it lies about 850 miles up the Amazon from the Atlantic, because the depth of the river makes this port accessible even to transatlantic liners.

The climate

As less than 10 % of the area of Brazil extends south of the tropic of Capricorn it might be assumed that the climate is predominantly tropical (the tropic of capricorn passes through the town of São Paulo). A number of factors however modify the influence of latitude, such as altitude, prevailing winds and distance from the sea.

Because of the vastness of the country and the factors just mentioned the variations in climate are considerable. A real tropical climate reigns in the Amazon valley and on the coastal strips southward to Santos. On most parts of the plateau the climate is subtropical and in the three southern States it is even temperate.

A clearer indication is given on map no 1.



Bij courtesy of the Conselho Nacional de Geografia

MAP I

Racial composition and population data

A number of nationalities and at least five distinct races have had their part in the racial composition of Brazil.

When the first Portuguese landed in Brazil they found Indians. Later, more than 3,000,000 black slaves were imported from Africa. Latin, Teutonic, Japanese and other oriental peoples immigrated to the country.

Based on the estimates by C. A. Gould in the Journal of Geography of April 1941, the racial composition of Brazil can be suitably illustrated in the following table:

Racial composition

Portuguese stock	12.8 %	white
Italian stock	8.9 %	„
Other South European stock	8.4 %	„

Latin race	30.1 %	white
Teutonic race (chiefly German stock)	2.6 %	„
Other and miscellaneous	11.7 %	„
Negroes	5 to 12 %	black
Mulattos	25 to 32 %	brown
Mestiços (White/Indian mixture)	15.5 %	„
Pure Indian	2.2 %	„
Japanese and other orientals	0.7 %	yellow

The influence of the white races is increasing as a result of continued white, and lack of new black or yellow immigration. The Portuguese have little race prejudice and as only the men immigrated in the first century of Brazil's colonial history, intermarriage was more or less a custom. This, and certain other factors resulted in a mixture of races and a practical absence of race problems, the consequences of which are mentioned in Chapter II.

Localization of the population

The next table shows the latest obtainable data based on the census of 1950 compared with those based on the population census of 1940.

The table shows important differences between the density of population in the different States. The population is very unevenly distributed, as it is concentrated on the narrow strip of the coastal plain and the eastern part of the central plateau.

Furthermore the table shows, that the population of the Federal and State capitals amounts to $\pm$ 16 % of the total population.

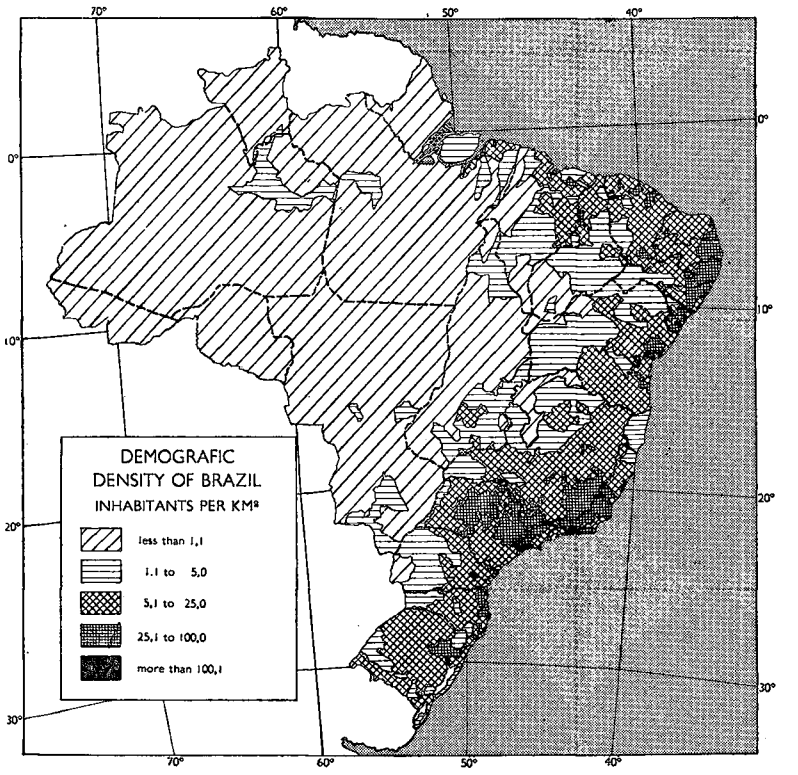
Population of Brazil

States	Area km²	Population census 1940	Population census 1950	State capital	Population state capitals 1940	Population state capitals 1950
Brazil	8,464,198	41,236,315	52,645,479	Rio de Jan.	1,764,141	2,413,152
Distrito Federal	1,171	1,764,141	2,413,152			
Alagoas	28,531	951,300	1,106,454	Maceió	90,253	124,544
Acre	153,170	79,768	116,124	Rio Branco	16,038	28,690
Amapá	133,796	—	38,374	Macapá	—	21,103
Amazonas	1,595,818	438,008	530,920	Manáus	106,399	142,372
Bahia	563,281	3,918,112	4,900,419	Salvador	290,443	424,142
Ceará	153,245	2,091,032	2,735,702	Fortaleza	180,185	280,084
Esp. Santo	40,871	750,107	870,987	Vitória	45,212	52,535
Fernando de Noronha	26	—	648	—	—	648
Goiás	622,463	826,414	1,234,740	Goiania	48,166	55,423
Guaporé	254,163	—	37,438	Pôrto Velho	—	27,545
Maranhão	332,239	1,235,169	1,600,396	São Luiz	85,583	121,917
Mato Grosso	1,262,572	432,265	528,451	Cuiabá	54,394	56,867
Minas Gerais	581,975	6,736,416	7,839,792	B. Horizonte	211,377	360,313
Pará	1,188,769	944,644	1,142,846	Belém	206,331	260,608
Paraíba	56,282	1,422,282	1,730,784	João Pessôa	94,333	120,857
Paraná	200,731	1,236,726	2,149,509	Curitiba	140,656	183,863
Pernambuco	97,016	2,688,240	3,430,630	Recife	348,424	534,468
Piauí	249,317	817,601	1,064,438	Teresina	67,641	93,352
State of Rio de Janeiro	41,666	1,847,857	2,326,201	Niteroi	142,407	190,147
Rio Branco	214,316	—	17,623	Bôa Vista	—	17,623
R. Grande do Norte	53,048	786,018	983,572	Natal	54,836	106,254
Rio Grande do Sul	267,455	3,320,689	4,213,316	Pôrto Alegre	272,232	401,213
Santa Catarina	13,849	1,178,340	1,578,159	Florianópolis	46,771	69,122
São Paulo	247,223	7,180,316	9,242,610	São Paulo	1,326,261	2,227,512
Sergipe	21,057	542,326	650,132	Aracajú	59,031	79,566

Source: census 1940 and census 1950

The population, especially of the larger towns, is growing day by day as a consequence of urbanization caused in turn by a number of economic, administrative and physical factors described later in this study.

Map no 2 shows the density of population.



By courtesy of the Conselho Nacional de Geografia

MAP II

Political Organization

It is necessary to mention in a few words the political organization and the main facts of its development.

Before the year 1807 Brazil was a Portuguese colony. After that followed a period of gradual change, with the 'United Kingdom of Portugal, Brazil and the Algarves' and the 'Brazilian Empire', until November 15, 1889, when the 'Republic of the United States of Brazil' was founded.

The first constitution dated 1891, was amended in 1926 and superseded in 1934 by a new one which was changed in 1937.

In the main these constitutions followed those of the U.S.A. but were sufficiently original not to be an exact copy.

The form of government is federal and the constitution describes exactly the relations between the National and the State governments. The State government have all rights, except a few which are essentially federal. Although the trend in legislation is towards centralization, the power of State government was very extensive in some periods. An interim period under the government of president Getúlio Vargas between 1930 and 1946 gave a very different picture. Especially after 1937, when a new constitution was promulgated, president Vargas gained very much power, lowering the influence of the State governments.

The main feature of the first Vargas regime was to stimulate production, especially industrial production, whereas agricultural production was not adequately helped. The period of World War II considerably stimulated the foundation of industries, while agriculture reached a far better position than previously, due to high prices caused by world shortages, and the necessity for the U.S.A. to have a productive Western Hemisphere.

Foreign investment

A young country like Brazil needs foreign investment to progress. Before the war British capital played an important rôle in Brazilian economic development. U.S.A. investments amounted to more or less half those of the British.

Until 1920 the Brazilian foreign debt was quite normal, but after that year there was an orgy of foreign borrowing, and a large percentage of the money was used for the maintenance and control of coffee prices. This could not go on and in 1931 and 1932 both Federal and State governments as well as a number of municipalities defaulted on their bond issues. Partial service was resumed in 1934 and suspended again in 1937. In 1940 came

a new amortization plan. This plan was not, as a matter of fact, very favourable to the bond holders.

During the war the U.S.A. for strategic reasons, acquired more economic importance than any other country, but after the war, when investigations as to the probabilities of normal investment in Brazil were made, results were not too encouraging. First of all there was a strong current in Brazil to 'shake off the yoke of foreign capital'. The 'o petróleo é nosso' (the oil is ours) fight in 1948 might be seen as an indication of this current.

Apart from this, some sections of the Brazilian people dislike accepting new foreign investments and it seems that private capital in the U.S.A. is none too anxious to flow towards Brazil. If large investments do take place in the near future, they might be seen eventually in relation to a strategic background.

In the meantime, industrial activity, transport and agriculture need a considerable amount of new capital, which cannot be provided by the country itself.

The statistics on foreign investment published by the 'Banco do Brasil', the central bank in Brazil, in its report on 1950 were rather surprising. In the end of 1950 the registered foreign capital investment, totalled 25,136 million cruzeiros. The increase in 1950 was about 60 %. It is very dubious, however, that this increase really is the result of new investments made in 1950, as all other sources of information indicate that the new investments of foreign capital in that year were only moderate. Probably a big part of the increase in the books of the Banco do Brasil is due to registration during 1950 of foreign capital already invested in Brazil before, in order to open the possibility to repatriate profits with a maximum of eight per cent at the official rate of exchange.

Practically the whole increase was due to North American investments. Total North American investments in 1949 were 8,230 million cruzeiros, in 1950 17,792 million.

British capital investment decreased from 4,475 million to 4,368 million cruzeiros in 1950. France as the third in the range

of investors in Brazil showed an increase from 654 to 815 million in 1950.

As this study aims to give some views upon the possibilities and expected changes in Brazilian agriculture in the second half of the twentieth century, something should be said about the three most important elements in Agricultural production, i.e., the human factor, capital resources and natural conditions. The next chapter will give some indications.

CHAPTER II

PRODUCTION FACTORS

The Brazilian

Because it is impossible to obtain a clear conception of the background to Brazilian problems without trying to understand the mental attitude of the people, it is necessary to give an impression of the Brazilian mentality.[1]) However inadequate such an impression may be, it is better to give it than to neglect it, because Brazilian mentality differs widely from that of other white peoples. A European or an American, studying Brazilian problems, without reference to the important differences between the mentality of the Brazilian and that of his own people is likely to obtain poor results.

A number of Brazilian sociologists have extensively studied this matter, and it is mainly from their points of view that the material for the following pages had been taken.

In his work 'Raizes do Brasil' (Roots of Brazil) Sergio Buarque de Hollanda sees Brazil as a unique exemple of the transplantation, on a large scale, of a European culture to a tropical and sub-tropical country, so big, that if it were as densely populated as Belgium, there would be room for all the people in the world.

This point of view, whether it is originally that of Sergio Buarque de Hollanda or not – found as it is in several books on Brazil – needs some further explanation, because it does not mean,

[1]) Although it is wrong in a strict sense, to speak of the mentality of a people, in this study it will be used to indicate the mentality of the average Brazilian.

as might be thought, that the Portuguese culture, or even the Portuguese civilization[1]) transplanted to Brazil, remained practically unchanged.

To elucidate this, it is necessary to go back in history to the foundation of the Portuguese colony, named 'Brazil' (so called because of its wealth of dye wood) and follow, in general terms certain stages of its evolution.

The history of Portuguese influence in Brazil began in 1531 after the country was discovered in 1500 by Pedro Álvares Cabral. The first immigrants who came to Brazil were not – as the Spaniards who landed on the Pacific coast – adventurers headed by ambitious 'conquistadores' looking for domains, treasures and glory, but farmers and merchants etc., who thought to find in Brazil more favourable conditions than in their own country, Portugal. They were more anxious to reach a certain state of wealth, as soon as possible, in a pacific way, than to obtain victories with doubtful results.

The first settlers in Brazil set foot ashore in the hope of finding commercial possibilities. In other parts of the world the Portuguese had already obtained much experience in trading with natives, so they were well prepared to behave in the same way in Brazil. Disillusion was the result, when they soon found that the inhabitants of the part of South America which they claimed, were poor tribes, mostly nomads and with practically nothing to sell to the invaders. The immediate result of this disappointing discovery was a neglect of the new colony: the Portuguese aim of 'quick returns' being easier to obtain in other parts of the world under their influence. Only after Spain and Britain had shown unmistakable signs of their interest in the new Portuguese

[1]) The meaning of the word 'culture' is taken from the formula of Taine, to which most Brazilian writers adhere, i.e., the result of race, environment and point of time, meaning the realization of the vital values. The expression 'civilization' means the representation of a second stage: the realization of the cultural values.

colony, was a real settling ordered by the Portuguese crown.

The first settlements were founded with a defensive purpose. The coast was divided in 'capitánias' (captaincies) such as Itamaracá and Pernambuco in the present State of Pernambuco, Salvador in the present State of Bahia and São Vicente, near the present São Paulo. With these points as main centres, further colonization took place.

Soon the immigrants came to realize the usefulness of the fertile tropical soils, more quickly than the Spaniards, who were too busy searching for Eldorado in the inhospitable Andes. The immigrants in Brazil soon became the masters of plantations of valuable crops. One of the most important features however for the development of the plantations was the finding of labour. In the beginning 'Índios do Brasil' were used for work on the 'fazendas', but the nature of the Brazilian Indian was not suited to regular farmwork, as he was a nomad and too independent to adapt himself to slavery.

It was not only slave hunting that incorporated the Indians into the developing of Brazilian economy. A far more peaceful procedure, the Catholic mission, principally carried out by the Jesuit order, did the same thing, from 1549 onwards.

In the last decades of our own century the Brazilian Federal Government has followed a third way, the civilization of the Indians by the 'Serviço de Proteção aos Índios' (the Indian protecting service) which tames the still existing savage tribes in the remote parts of the interior in an admirable way.

As the Indians were not suitable for work on the plantations, other means of providing the labour were sought. In a letter to Don João III, dated September 4, 1551, Nóbrega asked for some African slaves for the 'Colégio da Bahia' (cartas Jesuíticas, volume I). From this date until 1888 the African slave became more important as a source of labour on the plantations, notwithstanding the higher cost of buying the black labourers. (There are notes to be found making clear that the price of 15 Índios at

a certain time was 35 to 45 oxen, whereas the price of one black slave on the same day was 47 oxen).

The ending of the slavery for the Indians taking place in the second half of the eighteenth century and the ending of black slavery in 1888 (a century later) point in the same direction i.e. a far higher appreciation for black than for Indian labour.

Before the beginning of the 19th century it was practically only the Portuguese who emigrated voluntarily to Brazil, the land being closed to immigrants of other nationalities except slaves. This is one of the main reasons why one can see the formation of the Brazilian race as an intermixture of three strains almost exclusively: Portuguese, Indian and Negro.

The first Brazilian colonists came without their wives, life being too hard to bring European women in those days. They consequently intermixed freely with the native women. De Mello Franco painted this period in vivid colours. In the beginning, as he states, the only material that came from Portugal and stayed in Brazil was the (human) seed, while all the rest returned home. The strong sexual interests of the Portuguese, he writes, had a very big influence and this exp'ains the existence of the 'harems barbares' which were filled with 'negras da Guiné' as well as with 'negras da terra'. In those primitive days, the surest sword of the Portuguese was: 'o seu priape, inexhaustivel e ardente'. Keyserling sees the hypersensibility of the human being in Brazil more as a result of Brazilian climatic influences. For him, in the flora and fauna, and in men as well, there is physically 'this spirit of the Yeast of Creation'.

A. A. de Mello Franco writes about the three main constituents in the following way: Brazil has been the stage on which a great collision took place between two cultures (the indian and the negro) and a civilization (the Portuguese). The civilization came out victoriously, but not unchanged, for it took over many characteristics of both cultures. In the same way as the ancient

countries added the gods of their conquered enemies to their own, the Brazilian civilization is a result of the modification by indian and negro influences of the Portuguese civilization.

S. Buarque de Hollanda still sees his country tied to Portugal by a remote tradition, but sufficiently grown up to feed a common spirit, despite much which separates both countries.

De Mello Franco gives an interesting picture of the composition of the three influences already mentioned. For him it is a right-angled triangle of which the hypotenuse figures as the Portuguese, the long side to the right angle as the negro, and the third side as the Indian influence. This triangle was compounded during colonial times, in the time of the empire it became an amalgam, and in the present day he thinks it is fusing into an alloy. This melting process is also mentioned by Dr Percy Alvim Martin, in his article 'Portugal in America' published in the Hispanic American Historical Review of May 1937:

"In recent years we have heard the term 'melting pot' applied "to the assimilation of immigrants here in the United States. "The term is even more applicable to Brazil, more applicable than "to any other country of America. For in a broad though very "real sense Brazil is the ethnic and cultural heir to three con- "tinents – America, Europe and Africa... A variety of factors "environmental, ethnic and cultural will give the Brazilian a "national physiognomy quite his own. In fact, the process is "already clearly discernable."

The Portuguese system of colonization was milder than the Spanish. Other than in defense, the natives were not killed in mass, but made slaves, and this only when it was impossible to get better manpower. Though the whole system was more liberal to moral, social and religious differences and less fanatic than the Spanish, the Portuguese influence predominated because of its higher culture. Intermariage and the end of importation of new black reserves after 1845 consolidated white supremacy.

Before trying to give an impresssion of the present day

Brazilian mentality it would be as well to mention the principle characteristics brought together by the three strains.

The Portuguese influence – Buarque de Hollanda says 'Iberic influence', but I doubt if he is right, because the Spanish influence is of little importance – is characterized by him, as the culture of the personality to the utmost. Directly connected with this is the dislike of theories denying free will. Further he points to the absence of that 'rationalism of life' so well known in certain 'Protestant races'; to the ease with which the Portuguese are open to all anarchic influences; to all initiatives which separate rather than unite, even if their intention is to be constructive; to the absence of organized hierarchy (with the exception of the paternal hierarchy in the family) and of cohesion in social life. Lack of tradition is an immediate consequence.

Besides this, the Portuguese, coming to Brazil nowadays show some characteristics worth mentioning.

They are extremely thrifty and excellent merchants (their commercial code however not always being as strict as the European one purports to be). It is not an exception to have a Portuguese taxi driver in Rio de Janeiro telling you that he owns one or more 'fazendas' (farms) – and he does. The Portuguese merchant arriving without a penny in his pocket tries to get enough money in some way to open a tiny shop in which he lives day and night, sleeping under the counter and saving up money until his death or until he is wealthy enough to have an old age without financial difficulties. Often, however, his children or grandchildren lose his money more quickly than he earned it.

Farm work is not interesting to the majority of Portuguese immigrants, the commercial side of life being more attractive.

The building up of a small farm with hard work and without enough possibilities for quick returns does not attract them.

It seems to be rather difficult to draw sharp bounds between negro and indian influences. Most authors point to the fact, that

as soon as the negroes were imported, there was a certain coalition between the coloured races to fight against the white. De Mello Franco says:

"From about 1550 on there was a fierce tragic cultural battle, "especially on religious grounds."

Because of the 'coalition', there was an intensive exchange of mystic conceptions and actions between the indians and the negroes. It is better therefore perhaps to speak as de Mello Franco does, of negro-indian influences.

Some authors, amongst them Buarque de Hollanda, think the negro-indian influences less important considering them as: 'the indian veranda to the iberian house'. Others, however, point to the importance of this 'veranda'. Paulo Prado states, that the strange mysticism, the 'macumba',[1]) the leaning towards extravagance, without thinking of tomorrow, the easy resignation when results are not in line with the efforts made for them, are all relics of the indian nomadic or half nomadic manner of life.

The 'childish extravagance' he writes, and the preference to count on the lucky chance, or on black magic and necromancy rather than on a gradually and carefully built up organization are all the same traces of indian or negro influence. The widespread use of all kinds of mascots, most of them of a barbaric origin, also is obviously inherited from negroes or indians.

The afore mentioned influences in space and time, resulted in the formation of the 'Brazilian mentality'. In trying to describe

[1]) Macumba is a kind of black magic still fully alive in Brazil notwithstanding the efforts of the authorities to get rid of it. The problem is a very difficult one, because macumba is always carried out in the small hours in quiet places. Furthermore a lot of people – and of course a number of policemen who have to execute the orders against it – are afraid of the macumba. Near the macumba is the 'baixo espiritismo' which is not prohibited. Some people even call it a religion. There are also all kinds of religious spiritism. The influence of the leaders of such religious sects reacts very strongly on illiterate coloured people especially. The Roman Catholic church is fighting these 'religions' as well as the macumba.

it, it might be felt to be an injustice to many Brazilians. This is not right however, because if one is describing a landrace, of rye for example, the individual specimen will not show the characteristics of the landrace. After what has been said above, genetically the Brazilian race, as most human races, must be judged as a landrace.

Brandt gives the following characteristics of the Brazilian of today. The Latin vivacity is still there, but becomes only visible in rare cases, being normally covered by a phlegm strange to Latin people. The word 'paciência' (patience), which drives other nationalities to despair, is as characteristic to the Brazilian as 'time is money' is to the North American.

The difference between 'o querer' and 'o fazer' (wanting and doing) is the second characteristic he mentions. Although he is probably right, his findings are not complete, and although completeness is not the aim of this chapter, it is necessary to mention some other aspects.

'The Brazilian mind' Keyserling writes in his South American meditations, 'has the luxuriance of the Brazilian flora. Whatever his blood, he is mentally more differentiated than his European father. The Brazilian lacks the coarseness and plebeian character of the Portuguese; generally speaking he lacks whatever makes the latter small and mean. The aphrodisiac atmosphere of the country gives him a charm and a melting sweetness never found in Portugal'.

Tavares de Sá pointed to the following characteristics of his countrymen. A lack of team spirit, which he thinks is perhaps the inevitable consequence of extreme individualism. This unwillingness to share the effort he sees not so much as industriousness, but more as a desire to receive all the glory. A change of government in Brazil, be it on the federal, the state, or the municipal scale, has traditionally meant a loss of momentum, because the new administration invariably interrupted all projects undertaken by its predecessor, and started out on new undertakings

for which it could receive sole recognition. Lack of staying power he mentioned as another liability. Brazilians start out with great energy and enthusiasm, but soon lose interest. As an example he pointed to the experiences of foreign technicians acting as advisers in the establishment of new industries. They were pleasantly surprised at the speedy installment of the new machinery and the ease with which the Brazilian workers acquainted themselves with its intricacies. The new factory would get under way more quickly and smoothly than its European or American counterpart. But once the novelty wore away, and the every day problems were unglamorous tasks of maintenance and repair, the workers would lose their drive. More serious, he thinks, is a lack of the moral courage to face important problems once and for all and try to find a definitive answer. The Brazilian way he wrote, is to indulge in 'soluçõezinhas' (little solutions), that keep pushing the unpleasant task back, but never tackle it.

Tavares de Sá might be right in some of his points – his book is written with the obvious intention of making clear the faults of his own people in order to get rid of them – he does not, however, give the background to the symptoms he mentions and because of that he is in a way wrong. In the previous pages the influence of intermixing was shown, but one important point has still to be mentioned.

The definite end of slavery in 1888 did indeed liberate all black people, but it was not only benefit that they attained – they lost something as well. The slave, having had a very limited free will for some generations, was not used to thinking and acting on his own. On the one hand, he had to obey his masters' will, on the other, he had a – more or less firm – support from his master, in various important facets of his life. Becoming a free man in a time when the relationship between 'boss' and labourer was losing its former patriarchal character, he lost all support at a time when he needed it most. Therefore, being completely absorbed in economic life and to some degree in social life, he lacked the

attributes to become a valuable part of it. Against his will he even became a brake on economic development, especially so because there is little or no race prejudice in Brazil.

Neglecting the big differences between the black races brought into the country, the laziness of the black people – which is a topic for newcomers as well as for many Brazilians by birth – basically does not exist. If the black man is lazy, he is so because the white people did not teach him how to get more comfort in life by working harder and spending his money wisely. Moreover, it is not only black people who lack the knowledge how to spend their money wisely, a percentage of the white and coloured people in Brazil also have this failing. A different way of spending their money would not necessarily make them happier – happiness being an idea far too vague to be measured – but a special kind of education [1]) would stimulate every day 'needs' which, in turn, would stimulate labour and therefore production. With this stimulous the economic wealth of the country would naturally increase. Proper health, good nutricial care and competent managerial direction should of course be brought in line.

The soil

Bare rockgrounds are comparitively rare in Brazil, the climate being favourable to disintegration, and most of the land being of a respectable geological age.

Much is said, but little has been written on a scientific basis about the quality of Brazilian soils. As 'fertility' in connection with soils is a very relative expression which might lead to misapprehension, one might better speak of natural richness in plant nutritive matters in balance to each other (and the absence of plant-poisening compounds), together with a favourable structure of the soil. One might call soils in such conditions: "rich, well

[1]) The term education in this case does not mean the teaching of good manners, the Brazilian having in several ways better manners – natural or not – than many other white races.

structured soils, or soils with a high natural productive capacity".

To obtain an idea of the qualities of Brazilian soils it would be convenient to have many exact data on their content of anorganic Ions. These data, however, are comparatively scarce and it is therefore necessary to use less exact methods in grading.

According to Stebutt, the most important factor in the formation of soils is the climate. As most Brazilian territory has a fairly high temperature, together with enough rain, the tendency in soil formation is a lateritic one, leaving a topsoil poor in potassium, calcium, phosphorus and organic matter (due to rapid bacterial demolition under favourable conditions) and rich in unsoluble iron and magnesium compounds. As a matter of fact, there do exist large areas in Brazil with soils of a more favourable chemical composition, such as the aluvial soils. In the south, where more temporate climatic conditions reign, the type of soil tends to be less lateritic. There the richness in unsoluble iron and magnesium compounds in the topsoil is not so high (the colour is no longer red). The lack of potassium, calcium, and phosphorus is noticeable over large areas in the south as well however.

As far as investigations have reached, there are a few regions in which the chemical richness of the soils might be described in a different way. Virgin, rich, well structured soils south of latitude 14 are to be found in Northern Paraná, Western São Paulo and in Goiás. These regions are indicated on map no 3.

In the dry regions of the Northeast, principally in the States of Bahia, Alagoas, Pernambuco and Ceará rich soils also are found; this is explained by the low rainfall in these regions, thus, leaching is reduced to a minimum.

The vegetation is the second most important factor determining soil formation. [1]) Immense parts of the country are still

[1]) The former U.S. Agricultural Attaché in Rio de Janeiro, Mr. Guy Bush, pointed to the fact that there is a wide-spread misconception in Brazil about the quality of the soil. People mostly think, that soils under heavy forests are fertile. Most probably this misconception finds its roots in the opposite rule

heavily forested, but in the more occupied regions most of the forests have been cut down without adequate reafforestation. Paraná, one of the most important producers of timber, in former years undoubtedly had many more woodlands than now; in São Paulo, and most of the other States as well, the woods were and still are being cut down and burnt in order to get arable land. The shifting agriculture and the use of the abandoned plots for cattle grazing, on which the wild vegetation has sprung into existence, and which are burnt periodically in order to get rid of scrub, have deforested the principal agricultural States to a dangerous extent.

This very rough picture is not very encouraging. A number of Brazilians will probably fight it fiercely, under the guise of patriotism whereas it is in fact the opposite. Without any doubt there are regions in Brazil with a soil fertility which is to be compared with that of the best soils on earth, but most of the land now under cultivation needs continual gifts of manure, complemented by considerable amounts of fertilizer, to give regular crops and to preserve the topsoil.

Brazilians studying the matter already arrived at this conclusion. Monteiro Lobato, concerned with the use of soils in Brazil, once exclaimed: "I believe it's time already to launch another slogan [1]): 'Lets look at the Goby', the study of that desert might help us a lot some day". This exclamation is rhetorical of course and perhaps as far from the truth as the conception that the Brazilian soils in general have a high natural bearing capacity.

The latest official estimates (of the Ministry of Agriculture) for the cultivated area show, that the 29 most important crops covered 17,021,232 hectares in 1949. One should be careful however, to draw conclusions from this figure, as far as the potential amount of arable land is concerned. Estimates for land in

which is true, i.e. primary unforested land has invariably been found unsuitable for argicultural purposes in Brazil.

[1]) The other slogan he referred to was: 'Lets look at México'.

far away regions, that could be brought into cultivation exist, but the extent of land in accessible regions that could be reclaimed might be bigger than some authors think.[1]) Data, however, are not available and private estimates are judged to be rather unreliable. The impression one gets, however, when travelling in most agricultural zones is that only a small part of the potential agricultural lands is used as such.

A factor which limits the total area of agricultural land is the topography of the country. Leaving the Amazon region and far away zones such as central Mato Grosso out, land with a slope of less than 7 to 8 % is scarce in Brazil. This means, that special measures should be taken to cultivate it, in order to keep erosion in check. As this has not been done, tremendous areas have been ruined or heavily damaged. Recuperation of those soils may not be judged impracticable, however, as the same climate, that stimulated the devastation can be helpful for its recuperation. The climatic conditions, and the soil, according to the former U.S. Agricultural Attaché, Mr. Guy Bush, are comparable to those of the southeastern States of the U.S. i.e. North and South Carolina, Georgia, Florida. Kentucky, Tennessee, Alabama, Mississippi and Louisiana.

Capital

Capital is short in Brazil. The high rate of interest (10 % is a fairly low rate) is, amongst other factors, caused by this shortness of capital.

The main causes for this shortness are:

- Brazil is still very young as an independent country;
- The national income per head and per annum is comparatively low (Brazil US$ 125–165, the U.S.A. US$ 1,425; not

[1]) George Wythe, Royce A. Wight and Harold Midkiff in 'Brazil, an Expanding Economy': "... some abandoned and neglected lands could be turned to advantage."

taking into account the fact, that usually the official rate of exchange is not realistic nowadays);

- The Brazilian does not like to invest his money in industrial or intensive rural enterprises, the basic expectation of this sort of investment – moderate returns through a large expansion of production sold at moderate prices – not being in line with his speculative trend.

The lack of interest of the Brazilian investor is not so strange if one compares the net profits to capital and surplus in several branches of Brazilian business.

The Conjuntura Econômica of January 1949 gives a.o. the following figures for such net profits.

	1946	1947
Agricultural corporations . . .	13.9 %	13.9 %
Industry	16.9 %	14.3 %
Electric power	13.4 %	9.8 %
Banks	9.9 %	10.8 %
Commerce: wholesale	33.8 %	22.7 %
retail	28.0 %	23.6 %

The Abbink report of 1949 suggestively referred to 'high-unit-profit mentality', an expression which is even clearer if one takes into account that, for instance, in industry in 1947, 36 % of the sales value was devoted to interest, depreciation, other overhead expenses and profits, whereas only 16 % was spent for wages, commissions and bonuses (data of the Brazilian Institute of Geography and Statistics).

Lack of stability in the purchasing power of money is another factor causing little interest in the investing of money in intensive agricultural or industrial enterprises. Individually it seems more profitable for the Brazilian to invest his money in real estate, especially in urban construction, such as apartment houses or office buildings. It has been estimated for instance, that in

1948 the cost of building construction was about 7,500,000,000 cruzeiros (US$ 400,000,000.00 at the official rate of exchange), whereas the total national income might be estimated at about 150,000,000,000 cruzeiros of which not more than about 10,000,000,000 cruzeiros are estimated as savings (excluding purchases of durable consumer goods other than houses).[1]) It is not only in a direct way that the high rate of urban construction has a bad influence on other more productive fields of economic activity; indirectly industrialization has been hampered by a further growth of the urban population and the absorption of cement, lumber and steel supplies by the cities.

Another hampering factor is that a regular capital market for corporation shares, and fixed-interest government or business obligations is only in the embrionic stage in Brazil. This makes transactions in shares and obligations a difficult proposition.

The attraction of foreign capital could be a solution, as long as conditions for foreign capital were favourable. This has not always been the case, not only owing to some of the factors already mentioned, but also to uncertainty as to whether or not the capital, or at least the revenues of it, would be allowed to flow back to the investing country.

In the U.S.A. recently talks have been held on the possibility of safeguarding the American investor in Brazil against 'inconvertibility' of his revenues. This would be a step in the right direction.

The risk of devaluation of the Brazilian currency might be present, but this risk is calculated in the relatively high profit the investor gets from his money.

[1]) Figures taken from the 'Abbink report'.

CHAPTER III

AGRICULTURE AS A PART OF BRAZILIAN ECONOMY

To study Brazilian agriculture one should at least have an idea about the rôle it plays in Brazilian economic life. Therefore this chapter will give a schematic picture of this.

Several Presidents have stated 'Brazil is predominantly an agricultural country'.

Some data about national income and economic employment can prove these statements.

Based on figures Wythe, Wight and Midkiff mentioned in their book 'Brazil, an expanding economy' the distribution of national income might be represented by the figures of the table on page 33. In studying these figures it is seen, that Agriculture and livestock are in the lead. The figure for manufacturing and construction is based on the output of an odd 42,000 million cruzeiros whereas for raw material, a large part furnished by national agriculture and cattle raising, about 37 % should be calculated plus 2 % for power. ('Conjunctura Econômica').

Another way of demonstrating the predominance of Agriculture is given in the table, on page 34, showing the number of persons (older than 10 years) engaged in various non domestic activities. The 'Observador' gave in 1948 these figures concerning 1940. The classification is such, that a person employed in some field of activity is included in that field, his individual profession not being taken into account. For instance a gardener in a textile plant is included in 'Manufacturing'.

National Income, by Productive Classes, 1946. (In millions)

Class	Income	
	1000 cruzeiros	%
Total	156,210	100
1. Agriculture and livestock	28,316	18.2(1)
2. Minerals	1,164	0.7(2)
3. Manufacturing and construction	27,751	17.9
4. Government and utilities	14,424	9.2
5. Trade, distribution and business rents	60,630	38.8(3)
6. Other rents	3,300	2.1
7. Light and power	650	0.4
8. Transportation	3,160	2.0
9. Trucking and taxis	4,420	2.8
10. Coastal trade transportation	316	0.2
11. Insurance and banks	2,700	1.7
12. Real estate transactions	2,200	1.4
13. Medical care	2,000	1.3
14. Engineers, legal services and dentists	1,500	1.0
15. Lodging and restaurants	850	0.5
16. Domestic servants	850	0.5
17. Repair shops	500	0.3
18. Others	1,579	1.0

Figures represent total values.

Comments:

1. Farmers' consumption of own production included or not is dubious, other sources give a production of 31,000 million in 1946.
2. In Brazil mineral extraction is generally added to Agriculture.
3. The excessive figure for trade, distribution and business rent is symptomatic, it is even higher than item 1 and 3 added together!
   The putting together of trade, distribution and business rent is not so strange as one might think at a first glance. Later in this study it will become clear.

The figures of the table on page 34 are far more impressive than those of the former table.

Taking the data of both into account one may extract some very interesting information, which, although very rough, is most probably not far from the truth.

Class	Total	%	Em-ployer	Em-ployee	Working for own account	Member of Pro-ducer's family	Un-known
	(*in thousands*)		(*in thousands*)				
Total	13,538		365	5,512	4,752	2,780	129
Agriculture, grazing	9,455	67	253	3,164	3,310	2,666	62
Extractive industry	391	3	4	114	225	45	3
Manufacturing . .	1,400	10	30	1,078	250	31	11
Commerce	749	5	54	368	306	18	3
Transportation and communication	474	3	3	390	75	4	2
Social services . .	899	6	18	308	524	16	33
Other		6					
			(*percentage distribution*)				
Total	100		2.7	40.7	35.1	20.5	1.0
Agriculture, grazing	100		2.7	33.5	35.0	28.2	0.7
Extractive industry	100		1.1	29.1	57.5	11.5	0.9
Manufacturing . .	100		2.2	77.0	17.9	0.2	0.3
Commerce	100		7.2	49.1	40.9	2.4	0.4
Bank, insurance, exchanges . . .	100		1.9	79.8	17.9	0.2	0.3
Transportation and communication .	100		0.7	82.3	15.8	0.9	0.4
Social services . .	100		2.0	34.2	58.3	1.8	3.7
Other *)	100		1.3	41.1	44.7	0.5	12.4

Source: Gabinete Técnico do Serviço Nacional de Recenseamento, based on summary in 'Mercado de Trabalho', O Observador, Rio de Janeiro, Anno XII, No. 144 (January 1948) pp. 35–49.

*) The following classes are omitted from this tabulation: public administration, public education and national defense.

The national income per capita may be estimated at about Cr.$ 3,400.00 yearly.[1]) The income per person engaged in non-domestic activities is a little over Cr.$ 10,500.00.[2]) In the rural section about 9,500,000 people were economically engaged in

[1]) An approximation based on a total national income in 1946 of Cr.$ 156,000,000,000 – and an estimated 46,000,000 inhabitants.

[2]) An approximation based on a total national income in 1946 of Cr.$ 156,000,000,000 and a number of people engaged in non-domestic activities in 1940 plus 10 %.

1940. Presuming that the difference between 1940 and 1947 is neglectable in this respect, the income per person engaged in (non-domestic) activities in agriculture might be estimated in the following way: According to the 1940 census out of the 9,500,000 people, 1,000,000 are working on cattle ranches and some 6,500,000 in mixed farming. The part of the latter occupied in agriculture strictly speaking might be estimated in the following way: The 1940 census showed that the value of cattle on all mixed enterprises was about 10 % more than on real cattle farms. The same might be estimated as to the number of head of cattle. Official estimates show a total of about 46,000,000 head of cattle in 1946 of which 1,000,000 might be called dairy cattle. The dairy cattle are located mostly on the mixed enterprises; therefore beef cattle on mixed farms might be estimated at 23,000,000. For beef cattle 6 men per thousand head of cattle will do, and for dairy cattle one man might take care of 15 animals. So for beef cattle 23,000 × 6 = 138,000 persons might be employed and for dairy cattle 1,000,000 : 15 = 67,000; in total some 205,000 people, all on mixed farms.

In agriculture in its stricter sence therefore, about 8,300,000 people might said to be economically engaged. Statistical data from the 'Serviço de Geografia e Estatística' show, for 1947, a total value of all crops in Brazil of Cr.$ 24,380,000.00. This means, that per person engaged in this sector approximately Cr.$ 2,940.00 was produced per year. At the official rate of exchange, this means about US$ 155.00.

In industry [1]) one could estimate the average yearly production per worker at about 27,751 million divided by 1,400,000 i.e. more than Cr.$ 19,000.00 or about 1,000 dollars.

In commerce etc. the calculation is even more diverging; here the average yearly income might be Cr.$ 60,630 million divided by 800,000 i.e. Cr.$ 75,000.00 or 3,500 dollars.

[1]) Including small producers.

The three most important groups: agriculture, manufacturing and commerce have respectively 67 %, 10 % and 5 % of persons engaged, whereas the average income per employed person in these groups is interrelated approximately as 1 : 6 : 25.

From the data and estimates just given one might get the impression, that Agriculture is of considerable importance in the Brazilian economic life, but industry most probably a heavy competitor. This is not the case at this moment. Brazilian industry is very young, practically of this century, and therefore it is necessary to protect it against foreign competition. Only in this way it is possible to produce. As is to be deduced, however, from the estimates given about national income, average income per capita, and average income per person employed in the most prominent non-domestic activities, the purchasing power of the Brazilian people is very small, compared with that in the U.S.A. or Western European countries.

Having in mind a population of 45 or 50 millions, one might be inclined to compare the purchasing power of the Brazilian people with that of about $^1/_3$ of the inhabitants of the U.S.A. In actual fact, however, it should perhaps be compared with $^1/_{30}$ of the purchasing power of the U.S.A., because the income per capita in the U.S.A. is about ten times higher than in Brazil. In this connection it will be clear, that industry in general in Brazil has as yet little chance to compete with industries in several other countries in regard to mass production. The Brazilian market is still too small and purchasing power too much dispersed for a thriving all-round industry. This is one of the most important reasons why Brazilian industry can only produce at high prices, the products being forced into the home market by prohibited importation of similar products. Stimulated industry will lead to a continuous rise in all prices in the home market and subsequently to a loss of competitive power as far as exports are concerned.[1])

[1]) The small market is of course not the only important reason why several Brazilian industries are anti-economic: the factors necessary for industri-

An example is given by Luiz Amaral in 'A Cruz de Ouro'. He states that at a certain moment a tube of toothpaste was sold in Brazil at Cr.$ 2.50, the CIF price Rio being Cr.$ 1.00; import tax Cr.$ 1.00 and profits Cr.$ 0.50. To protect the national industry, the import tax was increased to Cr.$ 3.00, therefore, the consumers price went up to Cr.$ 4.50. Then North American firms installed their own plants in Brazil, which did not affect, however, the consumers price of Cr.$ 4.50.

Not only by prohibitive import taxes is the national industry protected; the import regulations are working even more in this direction, with no well designed policy as to which kind of industry should be stimulated and which should disappear.[1])

The foregoing might be seen as a direct attack on industrialization. This is not the case. It is only that the right moment for an intensive industrialization of Brazil is thought not to have yet arrived. First a real home market should be created by improving the purchasing capacity of the people. The other factors – except the natural ones – will then come spontaneously into play. In the meantime all efforts should be directed towards improving production in agriculture and livestock raising. Anti-economic industry should not be protected. Only highly rationalized industries, particularly those for processing rural products, should be stimulated under clearly defined programs.

The objective of creating a bigger purchasing power is being seriously studied by the Brazilian government.

alization of farm products mentioned in Chapter IV are of general importance as well.

[1]) The latest regulations in the field seem to indicate that the new Government want to alter this situation.

CHAPTER IV

GENERAL ASPECTS OF BRAZILIAN AGRICULTURE[1])

In the previous chapters some remarks have been made regarding the dimensions of Brazil, and about the differences in climate and quality of soils. Due to these differences a diversity of types of agriculture exists in the country. Notwithstanding this diversity a certain number of general remarks can be made.

One of the particular things that strike a traveller in Brazil is the limited area of arable land. Travelling by plane over the populated parts of the country one could get the impression, that a giant at play had scattered a few scraps of coloured paper over a green blanket. Indeed, the plots of arable land are apparently completely unplanned amidst the waste land. The waste land being 'campo', a kind of natural pasture of inferior quality, or secondary primeval forest.

This lack of planning which was normal in Brazil until recently, can be traced in the historical development of the country. Above all, three factors played an important part i.e. the almost unlimited area of land suitable for agricultural purposes, lack of care for the future in a broader sense and the 'get-rich-quick' mentality.

In the first period of colonization, the Northeast of the country was more attractive to immigrants than the Southern parts: the former being nearer to the home country. Therefore in the

[1]) Including cattle raising and forestry.

Northeast (Pernambuco and Bahia) the wealthier immigrants predominated.

In the second half of the seventeenth century it is in the Northeast that, thanks to favourable world market conditions, a sugar boom developed. The owners of the big plantations could afford the importation of negro slaves; the soil was suitable for the crop and the financial results of sugar planting paved the way for a monocultural system of farming. As there was an abundant area waiting to be cleared, the need for conservation of the soils did not seem necessary and the 'get-rich-quick' policy led to the use of the same plots without rotation and without giving the soil a rest.

Because the world sugar consumption was rising every year, and competition from other producing countries was small, the sugar boom lasted until the beginning of the 18th century. Then production of the Brazilian sugar soils began to decline as a result of exhaustion of the soil. In the meantime the competition of other producing countries increased.

It is typical of the Brazilian producer that he did not try to fight competition by means of rationalization. To invest money in order to get better returns by lowering the costs of production per unit is not a method in which the Portuguese seem to be interested.

The decline of the sugar boom coincided with the beginning of the gold rush in the State of Minas Gerais. Many plantation owners left their estates in order to explore, with their slaves, the newly discovered treasure grounds. The result was a quick decline of the importance of Brazil as a sugar-producing country and within a short period the country was no longer the world's leading sugar producer.

During the time of the sugar boom in the Northeast, there developed in the more Southern parts of the country a type of agriculture which, although in principle the same as that in the Northeast, was less profitable.

In these parts also, there was practically an unlimited area of suitable land. People had the same idea in mind: quick returns preferably with little effort. However, the resources were poorer. The settlers had not enough money to import African slaves and therefore had to use the inferior Indian labour. This was one of the reasons why these parts began to thrive much later than the Northeast. Only after the end of the sugar boom did the centre of agricultural importance move to the Southern parts, especially the Southeastern sector of the country. Here the harbour of Rio de Janeiro developed as a consequence of the gold rush in Minas Gerais. As the sugar production near Rio was also declining, it was partly abandoned and meat production took its place to provide for the rising demand in the capital.

Gradually attention was turned to the production of coffee on account of its rising consumption in Europe. When at the beginning of the 19th century immigrants from Europe were allowed to enter the country to replace the former African slaves on the 'fazendas', coffee production expanded quickly. This resulted in a coffee boom after 1850.

Coffee production ran a similar course to that of sugar. The symptoms are exactly the same as those in the sugar culture. The consequences, however, are more clearly visible to our generation, since they are of a more recent date.

After clearing the soil of the forest by fire, the coffee is planted between the stumps of the burnt trees, in a soil covered with a thick layer of ash. Until the first crop appears practically nothing is done, except to cut the new shoots from the still living burnt trees. After the plantation has been in production for a number of years, varying with the qualities of the soil, crops begin to decline. When the production grows too small to be interesting for the owner, as a consequence of exhaustion of the soil, the plot is abandoned. In the meantime other plots are set into production. If after planting, a plot proves to be unsuitable for coffee production, it is abandoned anyhow.

The abandoned plots are useless as arable land for years and years. In the more favourable cases they can be used as a kind of inferior natural pasture.

In this way the 'shifting cultivation' comes into existence, leaving behind not much more than a desert.

The shifting of the coffee cultivation has had as a result within the space of a century, the moving of the centres of cultivation over enormous distances. The Vale do Paraiba, between Rio de Janeiro and São Paulo, was the main centre in the beginning. From there the culture spread north, northeast and westward, respectively to Southern Minas Gerais, Espírito Santo and São Paulo. Now the Vale do Paraiba has practically no coffee, Minas Gerais is of little importance and in São Paulo the older coffee grounds near the towns of São Paulo and Campinas are left for new ones in Northern Paraná. Even in remote Goiás the crop is increasing.

At the same time other booms came and went. The rubber boom brought wealth in the centres of commerce in Amazonas and Pará. A thousand miles up the river Amazonas, in the densest part of the Brazilian tropical rainforest, a city of more than a hundred thousand people grew, with modern improvements and a perfect opera house. This city, Manaus, survived the rubber boom but the glory of it has disappeared since European scientists and entrepreneurs broke the Brazilian monopoly by smuggling reproduction material of Hevea Brasiliensis out of the country. Via Kew Garden, the way was cleared for modern rubber production in a plantation system in European possessions in the Far East. The Brazilian rubber gatherer could not compete with the modern scientific ways of the rubber plantations and the story repeats itself: the Brazilian rubber people did not fight the competition with modern scientific weapons, they persisted in their primitive way of gathering wild rubber and the boom ended in a drama. The big Ford experiment in Fordlândia and Belterra with which the Americans tried to get

a sure rubber source in South America, did not give very promising results. Perhaps one of the difficulties was that the plantation system for rubber in Brazil began fifty years later than that in the Far East and therefore at a time when competition was already very strong, whereas labour was less abundant.

In the meantime other less important booms took place. Of these cotton and citrus fruits brought speculative profits in some regions.

The shifting of arable land on a large scale, i.e. the shifting of cultivated areas from one region to another, is represented in miniature on the fazenda itself. The methods in use do not leave any other possibility. This might be considered as a kind of rotation system but it has not the benefits of such a system. The natural recuperation of the soil is not made possible, because of the wide-spread use of abandoned agricultural soils for cattle grazing, since the farmer burns his 'pastures' every few years in order to get rid of the scrub and ticks. This burning of the soil especially is bound to destroy a large part of the organic matter, not to mention the possible losses of anorganic substances as well.

This fire agriculture, however, must not be considered as a lack of sense on the part of the man who uses the soil, but on the contrary, as an example of his intelligence in order to derive the highest profits under existing economic and social conditions. There are in Brazil farms where methods differ considerably, but invariably these farms work under economic and social conditions more favourable to the introduction of modern methods.

The previous expositions make it clear that one of the outstanding points in Brazilian agriculture is the speculative basis. This basis causes soil exhaustion because of its exploiting character, with the result that the cultivated area is moving away from the bigger cities on the coast.

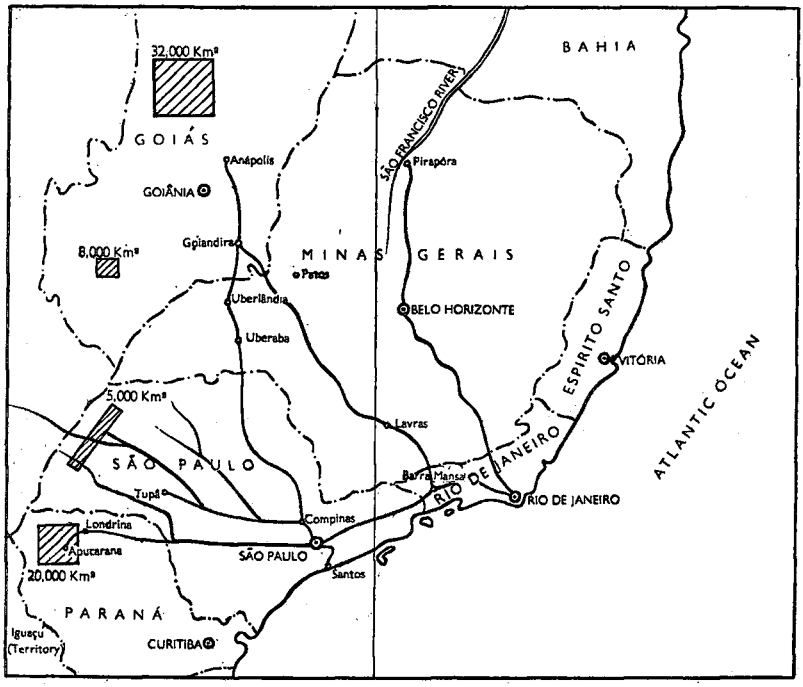
It is a common habit for people of other nationalities to think that they would have done the job better than the Brazilians.

As far as can be judged, this is a mistake. In general, a new private employer in agriculture will make the highest profits if his enterprise has the same economic basis as those existing enterprises under the same conditions. This is not an academic statement: it is clear enough, if one bears in mind that the economic basis of an agricultural enterprise is a result of the economic and social circumstances of the region concerned, in space and time.

The existing forms of enterprises have developed under these circumstances in much the same way as a definite flora develops under given biological factors. In the same way that it is possible for man to change such an autochtonous flora in a very limited way, it is possible to change the existing enterprises up to a certain point. Lasting results, however, can only be obtained with reference to autochtonous flora when the factors of the milieu are changed, and, with reference to enterprises, when the economic and social circumstances are altered. Then, it might be suddenly or gradually, a change may come 'all by itself' without the use of other influences.

It is not impossible that Brazil is really on the doorstep of such a change. Serápio Daniel de Carvalho, at that time Minister of Agriculture, already gave as his opinion in 1948 that Brazilian agriculture was nearing the end of the period characterized by the search for new coffee lands, with its attendant destruction of forest by semi-nomadic farmers who leave exhausted eroded lands for their descendants. One of the most important factors will change within a fairly short time, i.e. the abundance of land suitable for agricultural purposes without the need to expend much labour and capital. Brazilian and foreign observers have already pointed to the fact that really good soils are getting scarce in Brazil. The former U.S. Agricultural Attaché in Rio de Janeiro, Mr Guy Bush, made a study of this item and found in fact that south of latitude 14° [1]) south, rich virgin soils occupy

[1]) For conveniance sake, to exclude the Amazon region and the semi-arid Northeast.



MAP III

less than 70,000 square km and that cultivation of these areas has already begun. Map nr 3 gives roughly the areas of rich virgin land still in existence in this part of the country.

An examination of the map shows immediately the enormous distances between the suitable virgin soils and the centres of consumption.[1]) These distances approximate somewhere between 500 to 1000 km.

In a country with a perfect transport system this would already be a handicap. In Brazil, where the development of the transport system is highly deficient, it is almost prohibitive to cultivate a variety of crops in these far away regions.

[1]) The big cities or the harbours suited to all types of vessels, the places where the national and the foreign buyer normally purchase the products.

If transport costs are high, it is normal to try to find a way out along traditional lines, i.e. the productions of products with a high value per weight and, preferably, a small volume; in that way the transport costs will have less effect on the price of the product. Coffee is the example 'par excellence' in Brazil. Furthermore, the tendency will be to deliver not bulk products, but processed products.

This tendency exists in Brazil without any doubt and examples of considerable success can be given, except that the scale on which the 'industrialization' of farm products is effected is extremely limited. The reasons for this are obvious. The most prominent factors for a successful industrialization and processing of agricultural products are: capital; know-how; skilled labour; a dependable regular and cheap supply of the raw material suitable for the purpose; cheap power; accessible markets for the processed product. (These factors are not enumerated in order of importance.)

Regarding capital some words have already been said at the end of Chapter II.

There are many foreigners in the U.S.A. and in some other countries also with enough know-how in all branches of industrialization, who are willing to come to Brazil on adequate financial terms. In Holland for instance there is even a society the purpose of which is to 'export' specialists in applied sciences. People with scientific education are found in abundance in the upper strata of the Brazilian people, but specialists in applied sciences are relatively scarce. For rapid progress Brazil should attract these specialists.

However, there are a few factors making this kind of importation of talent more difficult than it should be. First a number of Brazilians show an over-estimation of their faculties and abilities together with a super-individualism which creates the desire to keep all the honour to themselves. Then there is a law, making it very difficult for foreign specialists to work freely. Foreign

diplomas are not considered as of any more value than that of a primary school certificate. The basis of this law perhaps confirms what has been said above: lack of faith in one's own ability and, therefore, the need of strong artificial help against foreign competition. Moreover, a foreigner obtaining Brazilian nationality, does not obtain all the rights of a national born Brazilian. This law hampers rather than stimulates naturalization by foreigners. Furthermore it is not only very difficult for a foreigner to get a more or less permanent position in a government service, but the salaries paid for such a position often do not permit the official to retain his usual standard of living. Private enterprises differ in this respect. Not only do foreigners have high posts in several industries, but they are usually well paid, for the management realizes the disadvantages of inadequate salaries, and the importance of a well paid and contented staff.

At a first glance skilled labour might be considered difficult to obtain. Nevertheless this is not quite true. Investigators of this subject have unanimously come to the conclusion that it is very easy to teach the Brazilian labourer how to work in an efficient way with modern tools and equipment. Illiteracy might be high, but this does not prevent the existence of a certain intelligence and handiness, high enough to train the workers for their task in a modern industry. In Salvador (Bahia) in a certain cocoa butter plant with a capacity of 250 tons of butter a month, the managerial staff consists of one white managing director and two assistant engineers; the labourers being all black or highly coloured. The factory works 24 hours a day, of which 16 hours have no supervision from the three white men. Of course extensive measures have been taken for the safety of the labourer and a constant control of production is maintained.

The belief that negroes and negroids are not able or willing to do enough work to gain an adequate amount of money to live in a decent way, becomes more and more a fiction, particularly in view of the statements of Morris Llewellyn Cooke, chief of the

North American technical mission to Brazil (1942).[1]) Skilled labour therefore does not seem to be the bottle-neck for industrializing agriculture, providing the training of the labourers is executed in the right way.

The lack of stability in agricultural production in a certain region has been mentioned already. This lack of stability as to the certainty of getting a regular supply of raw material is serious. The building up of a modern industrial enterprise means an investment of an amount of capital, whereas the transplantation of an industry means loss of capital. These are the reasons why it is not possible for an industry – unless it should be a very primitive one – to follow the shifting cultivation system.

On the other hand, should the distance between the industrial plant and the area where the raw material is produced, grow too great, one of the main advantages of industrialization would be impaired; costs of production would go up and inability to compete in the market would be the result. Positive as well as negative examples can easily be given.

1. The modern sugar factory with a relatively large invested capital makes it necessary to have the cane growing permanently in the surroundings of the factory. This has caused a change in the method of cane planting. At the same time the use of fertilizer plays a big part, not only affecting the permanency of the plantations, but their productivity as well.

2. In the northeastern States of Brazil, quite a number of different species of palms grow in abundance, some of them flowering and bearing fruit all the year round. Oil extraction in a modern way has not yet been effected, however, because there are no plantations which could guarantee the enterprise a regular

[1]) Morris Llewellyn Cooke studying the question whether or not the Brazilian workman has the capacities to meet the special demands of labour in modern industry, came to the conclusion that with proper health, good nutritial care and competent managerial direction the Brazilian workman gives a satisfactory work performance compared with that of countries where industrial development is already more advanced.

supply of nuts, and it is not yet sure, whether a system of plantations would be economically justified in the places where the palms are found.

3. One of the factors making it possible to industrialize cocoa production in Brazil is the limitation of regions, where climatic conditions seem to be suitable for cocoa growing.

Continuously accessible and attainable markets for processed products are generally more difficult to find than those for raw material, the latter practically always finding a buyer somewhere in the world, although prices are sometimes relatively low. For processed products markets are far more limited.

The market in Brazil is much smaller than one would generally deduce from the data on population. This is caused by the very low purchasing power of a large part of the people. Should the home market for a certain processed product be satisfied, then the difficult task begins of selling in foreign markets with fierce competition from other countries, most of them having more experience and more goodwill for this special class of products than Brazil. For many processed products in the agricultural section, however, the Brazilian home market is not yet flooded by the national industry. For instance as long as it is necessary to import powdered milk, the absorptive capacity of the home market for the product seems to be guaranteed.[1])

Bearing in mind what has been said in general about the most important needs for a successful industrialization with the processing of agricultural products as an aim, present day conditions in Brazil do not seem to be sufficiently favourable to allow such an industrialization on a large scale.

An outstanding example to the contrary (when superficially judged) is the textile industry. Already before World War II there was an important textile industry in Brazil. It was, indeed,

[1]) In this case, however, it is the availability of the raw material i.e. the milk to the factory, which is the difficulty. The extensive methods used in dairy farming result in long distances between farm and factory.

the largest industry in the country in which more capital was invested than in any other. The production of cotton in Brazil in pre-war years was about $2\frac{1}{2}$ times the amount used in the country.

During the war the cotton industry in Brazil became extremely profitable, when compared for instance with that of the U.S.A. One reason for this was that other South American countries, being cut off from their usual sources of finished textiles, bought their supplies from Brazil. In spite of the enormous profits most of the owners saw no reason either to expand nor to improve their factories. This is one of the reasons why today's Brazilian textile industry as a whole is not as efficient as it could be.

When textiles were still very scarce in Europe in 1948, and rationing made it difficult to get all the textiles one wanted, consumers in Western Europe asked for information on Brazilian textiles. It was calculated at that time that one had to pay more in Brazil than people in Western Europe had to pay on the black market. It is probable therefore that, unless measures are taken, the Brazilian textile industry will not be able to compete in the future with foreign manufacture. As for the home market, due to high prices and low purchasing power, the consumption will be much smaller than it would be if manufacture were more efficient. Under these circumstances any expansion of the Brazilian cotton industry seems impossible although the yearly crop of raw material is big enough to double or even treble the production.

Industrialization of farm products is not the only way of lowering transport costs. Processing of agricultural products by the rearing and feeding of livestock is alternative. This system is widely used in Brazil.

Brazil is one of the most important maize-producing countries. Its maize area has changed only very little during the last decade as is shown in the next tables.

World production of maize, in m.tons

	1935/39	1940/44	1946	1947	1948	1949
U.S.A.	58,814,817	72,296,959	82,548,730	60,552,838	92,723,919	88,315,444
Argentine . . .	7,670,444	6,581,750	5,814,670	5,999,650	4,572,000	
Brazil	5,484,886	5,268,925	5,411,673	5,585,587	5,511,800	[1]) 5,488,079
Estim. World Total	120,777,000	131,572,000	134,010,400	122,301,000	152,146,000	140,970,000

Source: Foreign Agriculture Circular [1]) Ministério da Agricultura.

Brazil's maize area, in 1,000 hectares

1935/39	1940/44	1944	1945	1946	1947	1948	1949
4,057	4,131	4,101	4,092	4,185	4,341	4,399	4,517 [1])

Source: Foreign Agricultural Circular [1]) Ministério da Agricultura.

Although this production is very important, the place Brazil takes on the world market in coarse grains is a very unimportant one. The following table gives some figures.

Export of coarse grains, in m.tons (to foreign countries)

	1946/47	1947/48	1948/49	1949/50
U.S.A. . .	3,097,784	943,864	2,263,572	2,773,883
Argentine	2,140,585	2,872,486	1,858,533	1,244,276

Brazil . .	1946	1947	1948	1949
	123,016	166,046	110,961	

Source: Foreign Agricultural Circular; Feed Statistics; Crops & Markets; Serviço Estatístico Ministério da Fazenda.

Taking in comparison with the export of the country as a whole, the export of maize is of little importance. The next table shows the value in 1,000 cruzeiros of 3 important export items compared with the export of maize.

Brazilian export, in 1,000 cruzeiros (to foreign countries)

Crops	1944	1945	1946	1947	1948	1949
Coffee	3,879,343	4,260,340	6,441,463	7,755,098	9,018,564	11,610,705
Cotton (raw) .	667,941	1,049,058	2,937,584	3,076,205	3,384,997	2,006,879
Cocoabeans . .	307,859	229,159	651,144	1,047,731	1,065,884	963,505
Maize	616	255	166,537	245,369	183,022	42

(Instituto Brasileiro de Geografia e Estatística).

Pre-war data show the same picture. The high figures for 1946 can be attributed to the loss of value of the cruzeiro, inexhaustible export possibilities immediately after the end of World War II and high prices in a sellers market. In 1947 when prices were still high the export of Brazilian maize was still of some importance, particularly as in this year swine fever (swine cholera) brought heavy losses to the 'sus'-genus which is the most important consumer of this crop.

Not only maize but other crops are also consumed by the livestock, principally pigs. The extent of this way of 'processing' cannot be estimated.

The degree to which agricultural products can be processed by means of livestock on an economical basis, is limited. The most prominent of the limiting factors are the following: demand, agricultural production, costs of transport of the agricultural product to the place where it has to be used as feed; limited knowledge of the breeder; costs of transport of cattle or meat; meat prices and quantity of meat consumption in the big centres.[1])

The demand for meat is much more elastic than that of the most important foodstuffs of agricultural origin. Even in a meat-consuming country like Brazil the demand will vary widely with prices and therefore will be the principal limiting factor.

[1]) For the production of other products of animal origin the list is more extensive, corresponding with what has been said about industrialization.

The use of land

About $^1/_4$ of Brazil's 851,600,000 ha is incorporated in some kind of agricultural or cattle-raising enterprise.

The census of 1940 gave 197,720,300 ha as the total area used by agricultural enterprises of all kinds. Of this agricultural area about 9.5 % is arable land, 44.5 % pastures, 25 % woodlands, 15 % land which is not used, and 6 % 'unproductive' land. The ownership of these lands is divided as follows:

1. individual persons			66.8 %
consisting of:	Brazilians by birth	59.7 %	
	naturalized Brazilians	2.2 %	
	foreigners	4.9 %	
2. communal ownership			17.5 %
3. juridical persons			10.3 %
consisting of:	syndicates and co-operatives	0.5 %	
	religious institutions	0.0 % [1]	
	others	9.8 %	
4. Government			3.7 %
consisting of:	Federal government	0.4 %	
	State governments	3.3 %	
5. Unknown			1.7 %

Taking the area of the enterprises as a basis, a division can be made as shown in the table on the next page.

This table shows that more than 73 % of the land used for agriculture and cattle grazing is incorporated in farms, bigger than 200 hectares and about fifty percent in farms bigger than 1,000 hectares.

As a rule 'fazendas' larger than 200 ha have either a monoculture such as coffee or are used as cattle ranches.

The arable land is concentrated more in the States south of latitude 14 ° [2], than in the others. About 64 % is situated in the States of São Paulo, Minas Gerais and Rio Grande do Sul; about

[1] Less than 0.1 %. [2] See note page 43.

	Number of enterprises	Area	Arable land	Pastures
Less than 1 hectare	39,305	22,911	18,264	1,480
From 1 to 2 hectares	103,077	145,072	119,849	9,448
From 2 to 5 hectares	272,086	924,768	624,453	124,084
From 5 to 10 hectares	240,089	1,800,688	875,575	393,484
From 10 to 20 hectares	315,676	4,557,586	1,710,481	1,134,411
From 20 to 50 hectares	455,057	14,298,481	3,782,990	3,915,839
From 50 to 100 hectares	204,705	14,256,093	2,587,781	4,933,158
From 100 to 200 hectares	123,008	17,178,729	2,256,352	7,077,472
From 200 to 500 hectares	89,332	27,430,468	2,634,711	12,686,717
From 500 to 1,000 hectares	31,478	21,575,802	1,572,896	10,747,652
From 1,000 to 2,500 hectares	18,932	28,544,426	1,327,036	15,099,034
From 2,500 to 5,000 hectares	5,390	18,411,939	597,194	9,864,356
From 5,000 to 10,000 hectares	2,217	15,068,452	365,526	8,272,384
From 10,000 to 100,000 hectares	1,236	26,300,597	331,892	11,407,963
From 100,000 hectares	37	7,204,235	30,430	2,474,251
Area not declared	2,964			

Source: Conselho Nacional de Estatística, 1949.

10 % in Paraná and Rio de Janeiro; 6 % in Santa Catarina and Espírito Santo; 8.5 % in the States of Bahia and Pernambuco; and about 11.5 % in the remaining States.

Density of the rural population

The rural population of Brazil is estimated at about 33,000,000 people. This number is not important. To obtain an idea of the amount of labour available for rural production, calculation should be based on the amount of people economically engaged in agriculture and livestock raising. As has been said in Chapter III, this number might be estimated at about 9,445,000. The 'Serviço Nacional de Recenseamento' divides this number as shown in the table on page 34.

Following the same rough calculation as in Chapter III, one finds that in agriculture, not counting cattle raising, about 8,300,000 people are occupied. Since arable land occupies about

9.5% of the total area of all enterprises, this means that approximately 19,000,000 hectares are used by 8,300,000 people.

Not taking into account the labour of the employers, about eight million people have to work on 19,000,000 hectares. In other words, one man works slightly less than $2\frac{1}{2}$ hectares.

It might be concluded from these facts, that labour is in abundance in Brazil in the agricultural areas. This, however, is not the case. Two main factors produce the reverse situation. Firstly, the Brazilian agricultural labourer has not the same labour capacity as, for instance, his North American counterpart, due to physical and climatic conditions, particularly in the northern parts of the country. Secondly, Brazilian labour is not so well backed by capital as labour in North America or Western European countries, most of the farm work being done by hand with the hoe as the only implement.

The next table gives the number of mechanical implements in use in Brazil in 1940:

tractors	3,380
ploughs	500,853
harrows	127,728
rollers	11,718
drills	156,383
cultivators	227,648
harvesting machines	5,805

Since 1940 many tractors and other farm machinery have been imported. Doubtless this has improved the situation, but nonetheless farm mechanization in Brazil is still in its infancy. Estimates show the number of tractors at 14,000 in 1950. Experts consider at least double the number to be necessary.

It is almost impossible to give an exact estimate of the labour necessary under present day circumstances in Brazil. In practice, however, it seems that there is no excess, but rather a shortage of labour.

The figures given in Chapter III showing the average yearly income per worker in agriculture, industry and commerce, are already a strong indication that urbanization can be anticipated. No other exact data can be quoted than those on page 5, but urbanization seems to be already a problem.

Whether or not urbanization is damaging agriculture is an open question. The rural population is increasing by childbirth, but this causes only a larger number of juveniles and does not improve the labour situation.

Labour shortage, on the other hand, might improve farm mechanization as long as other limiting factors do not interfere. Of these limiting factors topography and finance are the most important.

Furthermore it seems most unlikely that improvement can be reached even by immigration of labourers. The newly imported labour, working under the same conditions as the urbanizing labour did previously, will move to the cities in the same way. Another kind of immigration, which might help the country better, will be discussed in another chapter.

Social conditions in agriculture

After what has been said about production per worker in agriculture, it is clear that social conditions for the rural population can hardly be supposed to be satisfactory. In fact, health, education, housing, hygiene and social security are lacking in the interior of the country.

It is not by accident that the SALTE plan [1]) mentions 'Saude' (health) as the first principal item, because, although much has been done already in trying to eradicate malaria, yellow fever and other endemic illnesses, improvement of health would seem to be of foremost importance.

[1]) An enormous plan projected under the presidency of Eurico Gaspar Dutra in 1949 to stimulate production. *Salte* means Saude (health), Alimentação (food), Transporte (transport) and Energia (power).

As to education, it is estimated that about a 60% of the children between seven and eleven years have no access to primary schools. In the rural areas the scattered population and the inadequate means of transportation, together with poverty, are the principal obstacles. The census of 1940 showed that about 55% of the population of Brazil over eighteen years of age were illiterate. After 1940 two different campaigns were started to improve the situation, but probably 50% of the rural population is still unable to read or write.

The housing problem in Brazil, important as it is in the big cities, does not exist in the rural areas. As the climate varies from mild to hot, there is no need for heated houses. A mud-walled hut, covered with palm-leaves or grass as a roof usually gives enough protection against weather conditions. A more luxurious home may have the same mud-walls but is plastered and has a roof of tiles. Even bigger houses can be built in this manner. Window-panes are seldom used, only wealthier people being able to afford them. Grass or palm-leaves roofing seem to be dangerous to human health, as it provides a hiding place for a parasite, the 'Barbeiro' (Paustrongylus geniculata) which causes an uncurable illness. (Tripanosomiase americana).

In short, the hygienic conditions in the interior are deficient, due to illiteracy, lack of education and poverty, acting simultaneously. Lack of hygiene gives rise to a high death rate, principally for infants (20% die before reaching the age of one year) and encourages many diseases in children and adults. An outstanding example is the hookworm disease, which can easily be avoided by wearing shoes, and by practicing the normal rules of hygiene.

Social security could not possibly be more deficient than it is. The rural labourers, having little contact with each other in small groups far apart, are not in a position to organize themselves into larger groups. Even if they should attempt to unite in order to increase their influence, the lack of transportation facilities inter-

feres. Furthermore it is clear that under these conditions measures taken by the government to improve the situation of the farm worker are very difficult to control.

In the meantime a new legislation for social assistance for rural workers has been brought before Congress by the President of the Republic.

Summarized characteristics

The most important factors in Brazilian agriculture of today might be summarized as follows:

- The area of land at present suited to agricultural purposes in the more occupied regions is probably not so big as in the U.S.A. The chemical qualities of these soils are not very favourable, requiring an extensive use of green manure and fertilizers.
- Lack of capital in agriculture is one of the main reasons why the methods in use are far from modern.
- Taking into account the shortage of farm implements, the number of employers and employees seems rather on the small side.
- Social conditions in the interior are poor.
- On the other hand, the interest and the influence of the government in agriculture are increasing and numerous measures have been taken already, whilst others are to be expected, to improve agricultural production.

The factors mentioned above give rise to some important secondary circumstances:

- Lack of intensity in the use of land and, at the same time, soil exhaustion.
- Limited co-operation between agricultural producers.
- Strong position of the commercial intermediaries.

Intensification of the use of land is only possible if the economic

results justify it. The first thing needed for intensification is capital. Credit is short, however, in Brazil and therefore expensive. It is an open question whether there is any country in the world, where capital could be invested in agriculture in an economically justifiable manner at a yearly interest of 10%.

The long distances between the agricultural enterprises themselves, and between most of them and the consumption centres, together with poor communications and transportation make co-operation difficult. The super-individualistic attitude of most Brazilians hampers co-operation still further.

In general, the enterprises are not very strong financially; credit being expensive and hard to obtain and co-operation still far from its goal, there are big possibilities to earn large profits for the intermediaries by giving credit and dictating prices. In addition, shortage of capital does not allow the enterprise to have storage facilities, making it necessary to sell all the products as quickly as possible after harvesting, to avoid deterioration. It is clear that this weakens the position of the producer as a seller.

In conclusion, the main features of Brazilian agriculture seem to be the following: Brazilian agriculture has been built on a highly speculative basis. Soil exhaustion and shifting agriculture have caused the lines of communication (to use a suggestive military expression) between production and consumption centres to grow longer and longer. It is as if the city appropriated the soil fertility. The profits made in agriculture and in trading agricultural products, were not used to improve rural production, but were for the greater part invested in the cities.

It is most probable that Brazilian agriculture will change in the near future, as the abundance of suitable virgin land is dwindling fast.

Before concluding the first part of this study, the most important crops, livestock raising and forestry will be mentioned in the next chapter.

CHAPTER V

PRINCIPAL PRODUCTS

The following tables show some statistical data concerning area, value and production of Brazil's principal crops during a thirteen year period. Observing the data about value, one should keep in mind that the purchasing power of the cruzeiro has changed considerably during this period. According to the 'Revista Econômica' in 1939 it was about three times higher than in 1949.

The crops marked with a cross will be mentioned further in this chapter.

Brazilian agriculture produces a wide range of products. Besides the crops mentioned in the next tables, there are several others, so that the total number is more than thirty.

This diversity of crops may be considered a result of variations in climate and the tendency to change the traditional Brazilian system of monocultures into a system of polyculture. Such a change will not be effected in a short time. Economic and social influences play an important rôle in this evolution. It should be noted that between 1931 and 1948 about 90% of the total of arable land was still under the seven principal crops: coffee, maize, cotton, rice, beans, manioc and sugar, and the value of these seven crops was about 85% of the total value of all crops. Nevertheless there is a growing tendency to pay relatively more attention to other crops as is shown in the table on page 63 (final column).

PRODUCTION (in tons)

Products	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949 [1]
Pineapple [2]	85,005	88,710	88,608	85,368	82,760	78,146	83,626	73,892	74,906	68,524	69,028	74,450	81,658
Alfafa	142,909	140,666	136,996	111,137	103,204	97,318	102,253	129,323	148,406	162,322	177,625	188,745	179,247
Cotton	405,024	436,628	428,523	468,695	503,003	376,954	496,247	592,381	378,495	377,767	346,715	319,584	395,969
Cottonseed	945,054	1,018,798	999,882	1,093,612	1,173,673	879,559	1,157,910	1,166,810	745,520	744,086	682,924	629,484	799,940
Garlic	–	–	–	–	–	–	–	14,302	12,703	14,264	16,299	15,432	15,568
Peanut	–	–	–	–	–	–	–	31,922	28,584	31,697	53,497	138,961	135,702
Rice (not hulled)	1,231,799	1,529,274	1,484,514	1,319,973	1,687,534	1,811,255	1,893,834	2,100,467	2,146,965	2,759,026	2,596,374	2,554,334	2,720,159
Oats	14,650	7,377	7,322	6,942	8,344	8,333	8,431	6,877	11,085	8,694	8,789	10,023	8,700
Bananas [3]	77,624	80,140	87,741	75,175	80,981	79,992	84,885	92,717	107,311	117,207	127,467	136,291	147,696
Sweet Potatoes	–	–	–	–	–	–	–	659,125	967,921	787,888	851,419	933,806	923,172
Potatoes	322,791	401,777	503,822	433,746	452,500	417,443	517,517	462,660	595,670	541,743	575,387	585,310	747,764
Cocoa	118,900	141,839	134,759	128,016	132,305	108,869	178,300	116,532	119,656	131,659	119,056	96,910	133,376
Grean Coffee beans	1,460,959	1,404,143	1,157,031	1,002,062	961,552	829,879	921,934	686,686	834,916	917,318	947,489	1,037,465	1,068,283
Sugar Cane	15,289,690	16,581,859	19,987,772	22,252,220	21,463,054	21,574,416	22,050,636	25,158,948	25,178,584	28,068,845	28,989,901	30,892,577	30,928,755
Onions	–	–	–	–	–	–	–	69,523	78,096	86,795	87,470	97,828	96,294
Rye	16,000	10,696	14,404	12,755	14,237	15,960	18,233	9,671	10,160	8,450	10,431	13,324	19,053
Barley	12,000	17,535	11,225	12,761	15,848	16,083	15,219	8,778	14,892	11,510	12,289	12,360	14,493
Tea	–	–	–	–	–	–	–	382	409	744	720	676	703
Coco [3]	141,358	133,079	129,426	133,900	147,681	142,626	148,124	135,666	137,712	155,740	216,903	234,181	235,946
Broad Beans	–	–	–	–	–	–	–	39,113	34,520	30,719	34,631	37,679	36,700
Beans	828,673	854,167	789,722	767,314	874,897	837,672	918,672	1,042,520	1,002,446	1,075,955	1,046,234	1,132,610	1,256,848
Tobacco leaves	83,642	91,101	95,998	94,768	95,337	92,951	91,541	104,363	113,449	119,225	110,889	117,627	144,504
Oranges [3]	5,711,728	6,049,824	6,029,023	6,399,333	6,349,839	6,234,481	6,265,563	4,893,532	5,037,305	5,272,104	5,310,228	6,129,180	5,974,846
Castor seed	167,328	127,864	177,335	148,141	173,011	129,368	158,719	185,096	160,436	164,064	182,930	231,147	201,179
Manioc	5,013,042	6,020,611	7,122,316	7,331,862	7,762,561	7,915,672	8,936,239	10,333,356	11,414,680	12,224,793	11,844,510	12,454,823	12,615,735
Maize (corn)	5,775,910	5,559,835	5,393,553	4,875,553	5,438,010	5,276,399	5,210,396	5,574,741	4,846,557	5,721,372	5,502,548	5,607,477	5,448,879
Tomatoes	–	–	–	–	–	–	–	41,487	58,903	87,324	114,555	102,595	111,095
Wheat	149,364	137,268	101,107	101,739	231,454	216,867	223,108	170,586	233,298	212,514	359,363	405,135	437,506
Tung	–	–	–	–	–	–	–	2,878	3,598	4,904	11,330	13,566	8,432
Grapes	215,174	194,642	200,345	214,297	127,472	237,855	166,826	191,356	209,028	220,461	168,762	239,160	235,279

Source: Anuário Estatístico, Ano XII 1947 and Ano X 1949. [1]) Ministério da Agricultura. [2]) in 1,000 fruits. [3]) in 1,000 bunches.

VALUE (in 1,000 cruzeiros)

Product	1937	1937	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949 [1])
Pineapple	21,601	21,749	23,167	25,094	25,431	26,515	36,063	45,478	52,607	63,048	82,557	94,404	107,143
Alfafa	38,347	36,118	32,707	28,854	27,477	31,529	42,098	57,473	78,017	95,115	120,218	151,367	171,203
Cotton	1,379,211	1,504,100	1,421,161	1,474,854	1,486,811	1,434,188	2,413,676	3,147,376	2,039,948	3,167,910	3,254,568	3,484,369	4,774,228
Cottonseed	319,032	345,650	342,027	282,296	285,657	356,477	501,092	439,213	275,962	308,686	402,722	433,799	500,050
Garlic	–	–	–	–	–	–	–	44,481	69,417	84,819	98,441	92,572	105,080
Peanut	–	–	–	–	–	–	–	33,368	33,731	47,077	111,102	292,274	288,539
Rice (not hulled)	726,797	831,763	786,370	684,699	957,064	1,155,799	1,493,472	2,122,043	2,441,353	3,188,193	3,337,875	4,130,737	5,347,364
Oats	4,268	2,598	2,715	3,067	4,291	4,751	5,258	4,724	9,271	10,120	12,460	15,200	14,112
Bananas	112,410	115,310	150,221	117,397	138,583	150,054	185,401	282,753	414,328	537,513	637,484	754,380	885,393
Sweet Potatoes	–	–	–	–	–	–	–	175,058	278,751	293,183	349,004	435,547	454,785
Potatoes	129,412	164,847	200,878	205,068	207,010	202,134	284,051	417,644	632,048	721,596	1,016,573	1,068,420	1,100,773
Cocoa	118,644	164,337	163,987	141,048	219,454	183,401	290,352	179,947	221,341	419,055	790,074	629,722	615,707
Green Coffee beans	1,979,850	2,026,891	1,667,247	1,377,833	1,358,999	1,334,285	1,737,744	2,392,944	3,717,173	5,336,074	5,532,486	6,450,919	8,485,763
Sugar Cane	376,959	463,903	580,994	651,315	678,937	736,732	871,717	1,397,645	1,682,100	1,972,088	2,190,905	2,425,494	2,752,105
Onions	–	–	–	–	–	–	–	104,908	149,441	162,873	171,212	176,197	217,304
Rye	5,920	3,969	4,878	7,428	8,721	10,116	11,277	8,618	11,468	17,224	23,351	25,803	30,805
Barley	3,244	7,072	4,295	5,537	7,357	8,142	8,981	6,148	10,280	12,398	18,123	22,205	25,705
Tea	–	–	–	–	–	–	–	5,017	6,352	13,181	12,717	12,060	12,292
Coco	32,875	37,426	32,122	31,041	40,496	49,875	68,360	79,752	95,024	153,669	178,999	225,870	248,232
Broad Beans	–	–	–	–	–	–	–	42,478	38,764	41,980	46,290	59,967	63,318
Beans	362,555	387,391	405,005	445,214	533,482	504,454	666,283	1,100,198	1,177,968	1,387,732	1,760,126	2,719,235	2,388,483
Tobacco leaves	180,354	190,847	191,577	178,538	186,841	204,430	245,012	400,635	515,219	616,911	614,131	613,293	630,333
Oranges	308,540	279,485	220,122	223,961	234,612	237,227	223,249	195,671	296,397	389,894	442,689	567,790	585,203
Castor seed	82,861	58,340	62,704	80,161	112,050	95,625	120,665	130,347	132,818	283,781	389,573	348,629	239,209
Manioc	507,526	515,413	549,710	514,168	594,527	707,237	884,866	1,309,884	1,688,982	1,955,667	2,070,326	2,357,570	2,695,590
Maize (corn)	1,345,120	1,323,999	1,231,995	1,185,933	1,349,543	1,477,594	2,134,652	3,151,960	3,380,417	4,087,778	4,390,117	5,249,030	5,693,309
Tomatoes	–	–	–	–	–	–	–	68,730	89,942	117,038	145,148	142,397	175,838
Wheat	71,275	73,661	55,358	69,813	163,150	151,854	166,007	152,199	241,775	378,322	930,726	1,022,937	1,067,389
Tung	–	–	–	–	–	–	–	4,831	7,508	8,810	13,342	12,327	8,532
Grapes	79,850	59,342	64,398	69,241	61,921	83,135	73,887	120,388	156,314	174,904	196,478	289,702	278,527
22 cultures	8,186,651	8,613,811	8,192,838	7,803,560	8,682,414	9,155,554	12,454,109	17,142,740	19,270,909	25,277,678	23,392,561	33,082,875	38,640,629
TOTAL 30 cultures	–	–	–	–	–	–	–	17,621,611	19,944,815	26,046,639	29,339,817	34,306,216	39,962,317

Source: Anuário Estatístico, Ano VIII 1947 and Ano X 1949. [1]) Ministério da Agricultura.

AREA

Products	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949 [1]
Pineapple[1]	10,335	9,849	10,246	9,282	9,718	9,069	9,581	8,995	11,422	12,863	12,182	12,613	13,096
Alfafa	27,462	22,981	26,164	20,325	20,107	20,572	22,317	27,681	26,564	24,081	25,494	24,617	25,064
Cotton[1]	2,235,872	2,350,159	2,272,552	2,412,484	2,492,594	1,931,399	2,423,716	2,807,758	2,721,584	2,479,580	2,470,091	2,307,585	2,497,295
Garlic	–	–	–	–	–	–	–	5,217	5,561	6,860	7,015	6,893	7,788
Pea-nut	–	–	–	–	–	–	–	31,344	40,617	34,451	51,652	141,920	136,177
Rice[1]	887,521	978,772	1,075,729	871,717	1,000,632	1,058,707	1,170,013	1,427,515	1,498,117	1,646,029	1,650,989	1,661,601	1,758,246
Oats	10,070	8,692	8,533	8,263	9,108	9,614	10,378	10,935	12,677	11,660	13,572	13,940	14,169
Bananas[1]	77,216	79,483	84,316	80,414	82,225	80,145	84,499	75,709	84,205	90,538	90,983	95,632	100,082
Sweet Potatoes	–	–	–	–	–	–	–	86,650	107,916	112,639	112,007	120,798	114,125
Potatoes[1]	61,781	81,747	85,191	66,420	69,640	71,974	101,995	84,017	115,855	110,122	116,521	128,068	154,856
Cocoa[1]	187,330	180,909	205,902	229,884	239,362	241,164	239,173	241,520	267,920	243,772	257,885	260,786	258,024
Coffee[1]	3,459,728	3,492,364	3,041,905	2,519,111	2,378,311	2,173,577	2,340,799	2,326,141	2,381,561	2,406,369	2,414,648	2,463,996	2,537,851
Sugar Cane[1]	453,920	473,709	495,683	564,164	560,226	559,004	577,235	675,606	656,921	758,134	772,853	818,608	796,687
Onions	–	–	–	–	–	–	–	19,770	21,895	23,463	22,507	24,737	23,281
Rye	14,250	9,040	12,536	12,888	14,571	17,234	20,063	14,439	13,800	11,945	13,608	17,435	23,638
Barley	8,490	12,665	8,723	12,727	13,700	14,065	13,739	12,042	13,757	13,067	11,742	11,102	13,874
Tea[1]	–	–	–	–	–	–	–	1,263	1,510	1,290	1,572	1,581	1,581
Coco	33,849	37,384	39,295	44,426	51,789	51,497	46,328	35,212	37,148	37,874	47,402	48,942	51,175
Broad Beans	–	–	–	–	–	–	–	51,057	59,208	57,177	62,922	76,410	80,350
Beans[1]	942,021	1,001,825	1,005,429	978,508	985,060	977,413	1,072,454	1,349,505	1,432,190	1,534,110	1,583,723	1,650,007	1,790,966
Tobacco[1]	102,187	91,840	92,887	96,419	96,313	96,214	101,694	114,769	143,565	136,495	134,211	143,877	145,447
Oranges[1]	102,501	101,723	115,655	124,589	122,630	123,422	123,749	170,662	73,183	75,918	77,916	76,024	80,656
Castor seed	143,017	114,504	114,819	140,749	169,277	126,544	153,943	207,563	200,073	200,350	219,422	258,195	251,720
Manioc[1]	387,797	473,104	533,300	584,094	586,027	608,276	665,649	807,009	897,988	907,737	911,285	913,022	941,309
Maize (corn)[1]	3,876,895	4,253,878	4,397,481	3,903,946	4,112,426	4,059,316	4,289,794	4,101,315	4,092,054	4,326,864	4,323,052	4,346,544	4,516,540
Tomatoes	–	–	–	–	–	–	–	3,346	6,591	9,032	11,279	12,772	12,408
Wheat[1]	161,752	169,611	206,933	201,091	271,874	277,265	291,807	328,487	315,548	300,842	391,555	536,334	630,102
Tung	–	–	–	–	–	–	–	3,804	4,456	4,667	9,186	10,767	8,899
Grapes	60,717	24,097	24,193	32,492	33,953	35,062	34,019	31,297	32,002	32,943	36,867	34,654	35,826
21 cultures	13,244,711	13,968,416	13,839,472	12,913,987	13,319,543	12,541,533	13,793,125	14,758,177	15,028,134	15,361,293	15,576,001	15,823,582	16,636,623
TOTAL 29 cultures	–	–	–	–	–	–	–	14,960,628	15,275,888	15,610,872	15,854,141	16,219,460	17,021,232

Source: Anuário Estatístico, Ano VIII 1947 and Ano X 1949. [1] Ministério da Agricultura.

Percentage of the Agricultural Area

Year	Cotton	Rice	Coffee	Sugar-cane	Beans	Man-ioc	Maize	Total 7 crops
1931	7.38	7.19	36.49	3.48	5.22	2.27	31.67	93.70
1932	5.59	7.55	35.02	2.89	7.07	2.41	32.83	93.36
1933	7.14	6.95	31.81	3.45	6.66	2.91	34.96	93.88
1934	12.87	6.53	28.01	3.84	6.70	3.05	32.30	93.30
1935	13.69	7.36	27.61	3.39	6.78	2.50	31.62	92.78
1936	15.31	6.90	26.92	3.58	7.31	2.65	30.11	92.78
1937	16.88	6.70	26.12	3.43	7.11	2.93	29.27	92.44
1938	16.82	7.01	25.00	3.39	7.17	3.39	30.45	93.23
1939	16.42	7.77	21.98	3.58	7.26	3.85	31.64	92.50
1940	18.68	6.75	19.51	4.37	7.58	4.52	30.23	91.64
1941	18.71	7.51	17.86	4.21	7.40	4.40	30.88	90.97
1942	15.40	8.44	17.33	4.46	7.79	4.85	32.37	90.64
1943	17.57	8.48	16.97	4.18	7.78	4.83	31.10	90.91
1944	19.03	9.67	15.76	4.57	9.14	5.47	27.79	91.43
1945	18.11	9.97	15.85	4.37	9.53	5.98	27.32	91.04
1946	16.14	10.72	15.67	4.94	9.99	5.91	28.17	91.54
1947	15.36	10.27	15.02	4.81	9.85	5.67	26.89	89.87
1948	14.65	10.55	15.65	5.20	10.48	5.80	27.60	89.93

Source: O Observador, 1949.

Coffee

Already in literature the importance of coffee can be illustrated by the fact that the 'História do Café no Brasil' by Affonso de E. Taunay is a work of more than six thousand pages. In addition to this work, an abundance of literature on coffee is to be found in Brazil, while literature on other crops is relatively scarce.

In 1727, according to history, coffee was introduced by Francisco de Mello Palheta into Brazil in the State of Pará. The first plants came to Rio de Janeiro from the north in 1760 where they were planted in a monastery. From the monastery the seeds were distributed to places near the cities of Rio de Janeiro, Rezende, São Gonçalo and to the Vale do Paraiba (Paraiba Valley).

The value of coffee as a commercial crop sprung into existence

in the early nineteenth century when the market for the product in European and North American cities steadily grew. From this time on coffee began its victorious, but destructive march through the country.

The Vale do Paraiba was the first area in which coffee planting expanded at an amazing pace. The spread of coffee cultivation coincided with the decline in gold mining, producing a migration from the gold-towns of Minas Gerais to the Paraiba Valley in the first half of the nineteenth century. About 1860 coffee reached its peak in the Vale do Paraiba and thereafter declined. Coffee plantations are no longer found in this region today. The decline was caused by lack of care for the trees, exhaustion and erosion of the soil. This was aided by the setting up of new coffee plantations in new areas in São Paulo State and the freeing of the slaves in 1888. In the neighbouring regions coffee lingered on. There are still coffee plantations in Minas Gerais. Originally in the southwestern part of the State and later in the East. They still exist also in the State of Espírito Santo and in Bahia, but the production is comparatively small.

It was coffee that stimulated the building of the first railroad in Brazil. In 1873 a line was built from Rio to Juiz de Fora, which was reached in 1875. Then in 1877 a branch line to São Paulo via Paraiba Valley was constructed. It was also principally the coffee that was responsible for the building of the railroads in São Paulo State.[1])

In São Paulo, the coffee history more or less repeated itself. From Campinas near São Paulo City, the coffee marched west (European immigrants provided labour), passing the borders of the State and penetrating Northern Paraná, where at this present moment coffee is expanding rapidly.

Today, coffee is grown in practically all Brazilian States but

[1]) It should be noted that this sequence between railroad building and production is the reverse order as that followed in the U.S.A., where first the railroads were built before production started.

the States of São Paulo, Minas Gerais, Espírito Santo, Paraná and Rio de Janeiro are of the main importance.

1948

State	Total agricult. area (in 1000 ha)	Coffee area (in 1000 ha)	Coffee area in % of total agricultural area
São Paulo	4,315	1,299	30
Minas Gerais	2,730	549	20
Espírito Santo	413	228	56
Paraná	1,100	198	18
Rio de Janeiro	352	53	15
Bahia	790	57	7

The number of trees was estimated officially at 2,250 millions in 1950. In the early thirties the maximum of about three thousand million trees was reached, but from that time on the number declined. Some experts expect a further decline to about one thousand million trees in 1960, because new good coffee soils are expected to be increasingly scarce and only sufficient for maximum 700 million trees.

The regions expected to bear coffee in the near future are:

1. Isolated areas in the extreme western part of São Paulo.
2. Northern Paraná, north of a line 25 km south of Londrina (south of that line frost makes planting too much of a hazard).
3. Parts of Eastern Minas Gerais.
4. Northern and Central Espírito Santo.
5. Parts of Central Goiás.

On the other hand, experiments in which exhausted coffee soils were used for the replanting of coffee, after adequate agricultural measures had been taken, seem to give promising results. Therefore the above mentioned estimates might be too pessimistic.

Coffee is planted generally in squares with 625 trees per hectare. When the plants are put in triangular bond, which is also done, it is possible to grow 721 trees per hectare.

The production of the beans starts four years after planting and varies widely according to the age of the tree, the variety, the soil and climatic conditions. In some districts coffee trees will bear economically for 60 or even 80 years, in others, especially on sandy soils, this period is only 8 years.

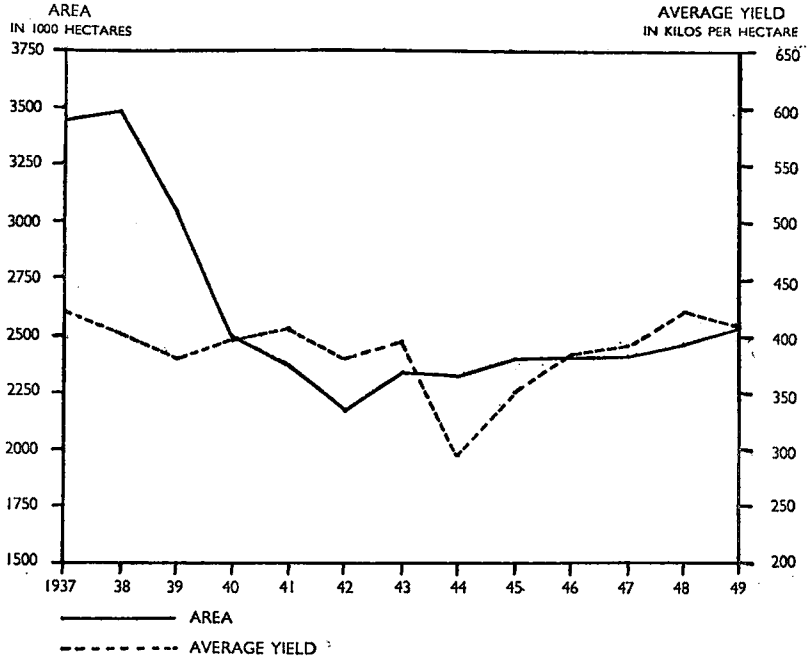
Diagram I shows in a glance the area covered with coffee and the average production in kilos per hectare during the last twelve years.

To understand the sharp decline in the late thirties, one should keep in mind that in the period before 1930 no provisions were taken to keep production in line with world demand.

Coffee, as a speculative crop, always expanded rapidly when

Diagram I

COFFEE



prices were attractive, the four-year period in which young coffee trees do not produce, forming a kind of camouflage. When the new plantations come gradually into production there might be a (relative) over-production with a sharp decline in prices.

Already in 1902 the State of São Paulo had a crop of 16,000,000 bags from 530 million trees in production and a 135 million more trees younger than four years. The government, seeing the danger of an over-production (world consumption being about 12,000,000 bags at that time), prohibited new planting for a period of five years. Severe frosts in the main coffee centres helped, and the crisis was postponed until 1906 when the Brazilian crop was 20,000,000 bags. The government then extended the prohibition of planting to 1912 and adopted a system of 'valorization', i.e. a system by which it purchased a quantity of coffee, and stored it until the market was ready to absorb it. This policy was based on three points:

1. Two consecutive bumper crops are usually followed by two consecutive smaller crops.
2. The coffee market shows little elasticity.
3. Coffee can be stored for many years without deterioration.

The small crops between 1909 and 1912 made this policy profitable for it was possible to sell the stored coffee surplus and liquidate the investment.

In 1917 another bumper crop made a second valorization necessary. Extraordinary cold in 1918 reduced the crop of that year and again the government was able to sell the stored quantities.

In 1924 a policy of permanent protection of the coffee market was adopted, however, without any real effort to control new planting. The result was that in 1928, the crop was already 36 million bags, while in 1930 the harvested quantity was more than 38 millions. The Government resources were not big enough to valorize these immense quantities. In a short time prices fell from 24.8 ct/℔ to 7.6 ct/℔. Price controls were instituted but these strengthened the position of other coffee-producing coun-

tries more than they helped Brazil. Between 1930 and 1944 more than 78 million bags of coffee were burnt or dumped into the ocean; older coffee plantations were ordered to stop production; many thousands of coffee trees were cut down. The 'Departamento Nacional do Café' (D.N.C.), founded in 1933, did its utmost to restore the prices at a reasonable level. The equilibrium was not only artificially restored; nature did her part as well. After the second world war an insect, called in Brazil 'broca do café' (Hypothenemus hampei), the coffee borer, did a great deal of damage. World demand having risen considerably after 1945, the government again got rid of the stocks it had accumulated in the foregoing years to valorize the coffee. In 1948 all old stocks were liquidated.

At this moment (1951) it seems as if the situation is sounder than before, although improvements are still possible and a control is anticipated.

The latest obtainable figures concerning coffee production are shown in the next table.

1950

States	Trees in production	New trees	Total
São Paulo	987,517,540	80,234,650	1,067,752,190
Minas Gerais	470,148,520	12,047,750	482,196,270
Espírito Santo	278,940,000	3,213,000	282,153,000
Paraná	123,317,000	44,710,000	168,027,000
Rio de Janeiro	10,479,000	2,080,000	103,559,000
Bahia	70,000,000	2,000,000	72,000,000
Pernambuco	50,000,000	187,000	50,187,000
Goiás	13,316,000	8,627,000	21,943,000
Mato Grosso	2,020,000	1,220,000	3,240,000
Total	2,096,738,060	154,319,400	2,251,057,460

Source: Departamento Nacional do Café.

About 25% of the production is used for home consumption; the

rest is exported. Official figures show that home consumption averages about 6.5 kg per capita yearly, which means a lower consumption per capita than in the U.S.A., but higher than in most other countries.

The harder coffee types are principally used for home consumption, whereas the milder types are prefered in the U.S.A. and in most of the West-European countries.

Maize (Corn)

Maize is the most important grain produced in Brazil. It covers more area than any other crop. The method of production is very different from that in the U.S.A. Much maize is still planted in Brazil according to the methods employed by the Indians before the Europeans came to the country. The trees of the forest are cut down and as soon as the timber dries a little, it is set on fire. Only the smaller timber and underbush burn. Then, even before the heavier timber is sawn into lumber or cut into firewood, the maize is planted. Planting is done generally in early spring in the southern part of the country, and in January to March in northern Brazil. A hole is made with a hoe, from ten to twelve grains of corn are put in each and a little soil is pushed over the seeds with the foot. The soil is very rich because it has been under forest and has the benefit of the ashes of the burned vegetable matter. The maize springs out of the ground with the first rains and grows rapidly. There are so many stumps that the planting is very irregular and cultivation is difficult. Since the fire has so recently burned all vegetable matter, very few weeds appear. Maize grows tall in Brazil; often a man on horseback cannot be seen in the field. A stalk usually produces one ear only as it has not been selected for two-ear production, and often a few stalks are barren because so many are left in each hole. Sometimes, when the maize is four months old, beans are planted in between and they climb the maize stalks. In this way the farmer gets two crops a year from his land.

In the North, maize is grown between rows of castorseed. This may be one of the reasons why foreign buyers of Brazilian maize strongly insist on the product being free of castorseed, since both products ripen practically at the same time.

The yearly yield depends very largely on an adequate rainfall at the critical time, just when the maize grains begin to develop on the cob. Too much rain when the corn is forming the tassels, reduces the yield.

When the time comes to gather the corn at the beginning of winter, i.e. May or June, the workmen go in to 'break' the maize. They really break the corn, because often the stalks have grown so tall they must be broken down so that the ears can be reached to be pulled off. The maize is piled on the field and may be hauled away at once to be stored, or in places where there is little or no rain during the winter months it may be left in the open for some time. In cases where beans have been planted in the corn field, these are harvested first, so the maize must be left on the stalk until the beans are out of the way. The maize is always pulled or 'broken' complete with the shuck, and in this state it is stored. The shucks help, to some extent, to keep out the weevils. This is also the reason why the Brazilian farmer plants predominantly flint varieties of maize. The softer dent corns, stored without the shucks, as is done in the U.S.A., would be destroyed by the weevils in a very short time.

Sometimes the harvesting is left to the pigs, which are simply driven into the field, to eat what they can find.

The Indians, and some of the Brazilian farmers, plant corn for a few years on the same plot of ground. Then, after the yield has grown too small, a new piece of timber is cut, burned, and the land is put to use. In some cases the farmers plant grass instead of beans in the corn during the last year and in this way pasture is obtained; the corn then being planted on a new plot of land. In many parts of the country this way of maize growing is no longer possible, because the timber has been cut down. In these

older regions new methods of corn cultivation have had to be adopted. Thus, one finds production methods ranging from the primitive to the most modern in various parts of the country.

When planted in rows, these are usually four feet apart, two grains in a hole, the holes being two feet apart. This makes it easy to cultivate in between the rows by hand or mechanically. On many farms the axe, the bush-hook and the hoe are the only implements, but the number of farms on which ploughs, harrows and drills are used is greatly increasing. Even combines are used nowadays in some places.

All maize growers have a sheller. A few of the most modern ones that take maize, husk and all, sending out the winnowed grain all cleaned, can be found on some of the more modern farms. Handpower shellers, however, are in general use.

The percentage of maize grown on mechanized farms is relatively small, but gaining in importance. Hybridized maize, suitable to Brazilian conditions, has been introduced and pushed by the Basic Economy Cooperation, controlled by Nelson Rockefeller. The results are promising.

Maize is grown in all Brazilian States, but the table below gives an impression of the importance of the main maize-growing States (São Paulo, Rio Grande do Sul, Minas Gerais, Paraná Santa Catarina), whereas diagram II shows the total area and the average production per hectare between 1937 and 1949.

Normally, nine tenth of the whole production is used for home consumption. The production is largely interrelated with pig breeding as swine are the most important consumers. When between 1937 and 1939 the government stimulated hog breeding, maize production went up. As long as pork prices are reasonable, maize production is profitable, even with the low average yields shown in diagram II. As soon as difficulties start in pig breeding the maize producers are hard pressed. A good example for this was

Year	Maize Area (Brazil: in 1,000 ha)	Maize Area (% from 5 States)	Production (Brazil: in 1,000 tons)	Production (% from 5 States)
1931	3,170	79.92	4,750	79.09
1932	3,722	80.23	5,770	79.95
1933	4,352	79.46	5,608	81.24
1934	3,988	77.63	5,292	78.53
1935	4,076	77.23	5,933	80.31
1936	3,872	75.49	5,721	80.51
1937	3,877	75.29	5,776	79.90
1938	4,254	76.49	5,560	78.72
1939	4,379	77.73	5,394	79.79
1940	3,904	78.92	4,876	81.71
1941	4,112	79.62	5,438	82.53
1942	4,059	80.24	5,276	81.61
1943	4,290	79.91	5,210	81.92
1944	4,101	80.76	5,575	85.51
1945	4,092	76.27	4,847	80.83
1946	4,327	71.12	5,721	84.34
1947	4,323	74.65	5,503	82.92
1948	4,347	76.12	5,607	83.20
1949	4,517	75.67	5,449	81.37

Source: O Observador.

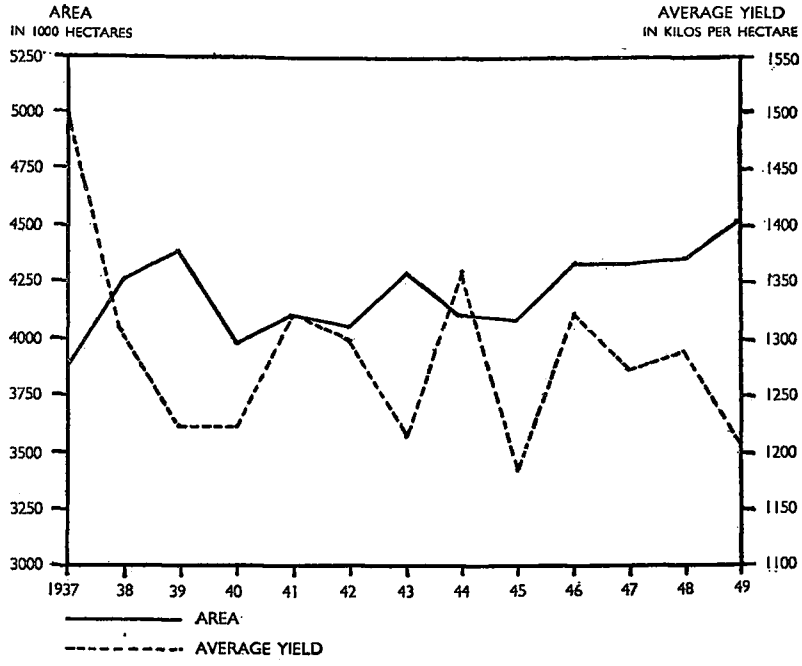
the year 1947 when swine fever decimated the pigs in Brazil. There were big surpluses of maize and the solution seemed to be exportation. As a specialized grain trade, storage facilities, and transportation facilities were lacking, difficulties arose, although there existed a sellers market for maize at that time.

In Brazil maize is not only used for pigs and other livestock (principally horses, mules and poultry), it is also one of the important items of the Brazilian diet, principally in the form of mashed foods. Cornbreads, cornflakes and other such processed foods are, however, unknown in Brazil. Cornflakes and similar imported American breakfast foods of corn are only used in the cities, primarily by foreigners.

Industrialization of maize has been introduced in the recent

Diagram II

MAIZE (CORN)



years. Corn-starch, glucose, corn-oil are now produced in São Paulo.

Although Brazil is the third maize-producing country in the world, after the U.S.A. and the Argentine, Brazil's place on the world market for the product is of little importance. The handicaps are:

- lack of uniformity;
- lack of storage and transport facilities;
- lack of a specialized grain trade.

Laws have been passed, establishing rigorous grading standards and prohibiting the exportation of maize with over 15 % humidity, in order to improve export possibilities. Since the war some

internationally well known grain firms have established subsidiaries in Brazil, and their activities may lead to improved market conditions within the country and eventually to better export possibilities.

According to official estimates 5 million tons are necessary for home consumption. This means that only about 10 % of the average production can be available for export.

Cotton

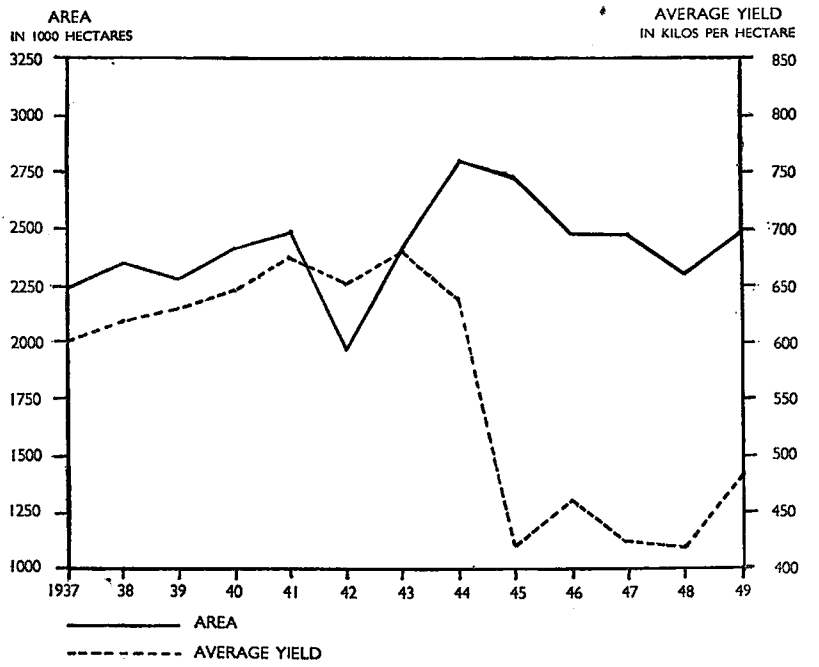
The first time cotton was mentioned in Brazilian history was in the year 1500. In 1749 the first cotton was exported to Europe and in 1750 the first cotton industry was founded in Brazil.

In 1871 Brazil already exported a volume of about 82 thousand tons. From that time on exports declined, but had peaks in 1919 and 1934. This last peak particularly caused some concern in the U.S.A. The opinion was that the artificially supported cotton prices in the U.S.A. stimulated production in Brazil, and furthermore general conditions in Brazil were looked upon as being favourable to cotton production. The alarm was unwarranted because for several decades cotton and coffee have reacted to price variations in a reciprocal manner in Southern Brazil, more or less in the same way as maize and wheat in the Argentine. However, cotton and coffee can hardly be combined in a stable and harmonious agriculture, as the harvest times coincide and both require a large supply of labour.

Between 1930 and 1941 cotton increased in importance, on account of crisis in the coffee situation. Considerable attention was paid to the cotton in this period, especially in São Paulo. After 1941 considerably less cotton was grown, due to bad weather conditions, soil exhaustion, and erosion, lack of attention caused by improved prices for coffee and for some other crops. An additional factor was the anticipated pricefall in the home market due to probable difficulties in exporting the product. After the

Diagram III

COTTON



government began to buy the cotton surpluses, with the intention of selling them immediately after the war, the cotton area was expanded rapidly once more. In 1944 Brazil had a cotton area as it never had before. The peak of exportation was reached in 1946 with more than 352 thousand tons, nevertheless, in that year, surpluses remained, which could only be sold later.

Diagram III shows the acreage in cotton during recent years together with the yearly average production per hectare. The decline in the average yield was caused by bad weather conditions, high prices of fertilizers and unfavourable price regulations, as well as by pests.

Cotton is grown in practically all Brazilian States. Two regions are the most important, however:

Zone I – Northeast (Rio Grande do Norte, Paraiba, Alagoas, Ceará and Pernambuco);

Zone II – the State of São Paulo.

The first zone is the older one. When the sugar was falling slowly into decadence in the Northeast, cotton took its place among the leading exports. The first expansion came about 1750 in Pernambuco. Some 85 % of the big exports of 1871 were from the northern zone.

In this zone a perennial variety is grown in the dry regions, sometimes called 'tree cotton', which has a long silky fiber of considerable strength. Except in a few sections the strains have not been kept pure, and have become mixed with annual varieties. This is to be regretted, because the long staple cotton is very much in demand, provided the grading and baling come up to industrial requirements. It seems, however, that in the northern zone it will be difficult to have modern grading methods more generally adopted.

It was only after 1918 when an exceptional frost in the southern coffee regions did much harm to the coffee, that the second cotton zone became important. It was not until 1936 that the São Paulo production surpassed that of the first zone. The next table gives figures on production in recent years.

From 1924 on much was done to improve the production in São Paulo. In that year Oswaldo Cruz Martins, after studying cotton in the U.S.A. was made chief agronomist of the São Paulo State Experimental Section in Campinas. From that time on improved varieties were planted. Another very important step was taken when José Garibaldi Dantas, returning from a special course in cotton grading at the University of Georgia, was made head of the Federal Cotton Grading Commission in the State of São Paulo. All cotton grown in the State has to be classified by this commis-

COTTON

Year	Cotton Area (in 1,000 ha)	Production (seed cotton) (in 1,000 tons) [1]
1931	738	375
1932	634	253
1933	889	504
1934	1,589	949
1935	1,765	991
1936	1,968	1,172
1937	2,236	1,350
1938	2,350	1,455
1939	2,273	1,428
1940	2,412	1,562
1941	2,493	1,677
1942	1,931	1,257
1943	2,424	1,654
1944	2,808	1,795
1945	2,722	1,147
1946	2,480	1,145
1947	2,470	1,051
1948	2,308	986
1949	2,497	1,200 [2]

Source: O Observador.

[1]) The ratio in weight between raw cotton and cotton seed is about 1 : 2.

[2]) Ministério da Agricultura.

sion, and as a result grading was improved enormously in this State.

The improved varieties brought the staple length up from about $\frac{3}{4}$ inch to 1–1$\frac{1}{4}$ inches, the better grading brought a better uniformity and the ginning too was improved by importing modern gins, which give the cotton a more attractive appearance.

The national industry uses yearly about 200,000 tons of ginned cotton. As can be deducted from the above table there is thus an export surplus every year. Before the war Germany was the largest buyer of Brazilian cotton, Great Britain and Japan following on the list. During the war Great Britain, Spain, Sweden and Portugal were the European purchasers, Colombia and, to a

lesser extent, Bolívia and Ecuador, the South American buyers.

Pessimism about the future of cotton as a major export crop is rather general in Brazil. Prognosticates seem rather haphazard, however, as many factors in the near future are uncertain.

The production of the staple is not the only important thing in cotton growing, the seed provides valuable by-products. Cottonseed oil is widely used in Brazil and the cake, that remains after pressing or expelling provides dairy cattle feed. An even larger quantity of both oil and cake than is at present produced can easily be consumed in the country itself. The average yearly consumption of cottonseed oil is 2.3 kg per capita (in the U.S.A. 21.4 kg). Before the war much of the cottonseed cake was exported, the change to home consumption starting during the second world war.

Other fibers

Although cotton is the prominent fiber produced in Brazil, the country has several other fibrous plants, some of which are used on a commercial scale. When during World War II Brazil could not cover its needs for raw material for its large sacken bale industry (an odd 40 million sacks are necessary yearly) interest in a national fiber production increased. Of the 33 native fibrous plants principally four, Caroá, Piaçava, Sisal and Jute, are used in fiber industry.

Caroá is produced chiefly in Pernambuco, Paraiba, and Bahia. In 1939 production was only 425 tons. In 1944 a top production of over 10,500 tons was reached, after which production declined slightly. In Pernambuco an industry to manufacture this fiber has developed.

Piaçava is a hard fiber used principally for the manufacture of brooms, etc. The production goes back many years and the quantity produced in the last 10 years varies between 5 and 6 thousand tons per year. Pratically all piaçava comes from Bahia.

Sisal (Agave) is mainly grown in Paraiba. The production is expanding since the war, production having risen from 2,500 tons in 1945 to 25,800 tons in 1948.

Jute production too is gaining importance. Japanese immigrants started its production in 1936. The production, 4,600 tons in 1941, was raised to 9,400 tons in 1948. The national production covers approximately 25% of the supplies needed for industries, the remainder being imported from India.

The afore mentioned products in Brazilian statistics are listed under 'produtos da Indústria Extrativa', which means that they are chiefly gathered and not cultivated. This, however, is not up to date, since sisal is mainly cultivated nowadays.

All fibers mentioned above, except piaçava, are normally used mixed with jute in bag manufacture. About 65% of the raw material in this industry is of national origin. Some of the fibers are used in the clothing industry also, often mixed with flax, grown for fiber in Paraná, Santa Catarina and Rio Grande do Sul.

There seems to be increasing interest recently in flax growing in these States. The fiber is not, however, of first quality and the production is small.

Ramie (China grass) is grown in São Paulo to some extent. It is manufactured in that State into threads and twines, and fabrics made from it are marketed in competition with cotton and linens.

Rice

The first reliable historical information referring to rice is to be found in the 'Crônica Geral do Brasil', where it is stated that Spanish priests and the Governor of Bahia were offered rice by the Indians.

In colonial times the crop was mainly located in the northeastern regions of the country and, though locally of some importance in those times, was not to be compared with, for instance, sugar. Nevertheless export is recorded at the end of the eight-

eenth and the beginning of the nineteenth century. It is even said, that in some years the export of rice was more important than that of any other crop.

After 1890 more attention appears to have been paid to rice production. In the southern States production was begun. Until the First World War rice had to be imported in fairly large quantities, but importation in 1913 had fallen already 75 % compared with that of 1905. From about 1930 onwards production was large enough to leave substantial export surpluses every year. These surpluses are in fact only about 5 % of the total production. Consumption per capita averages about 50 kilos a year.

The crop is grown in most Brazilian States, but those listed in the next table are the more important.

Rice production in tons

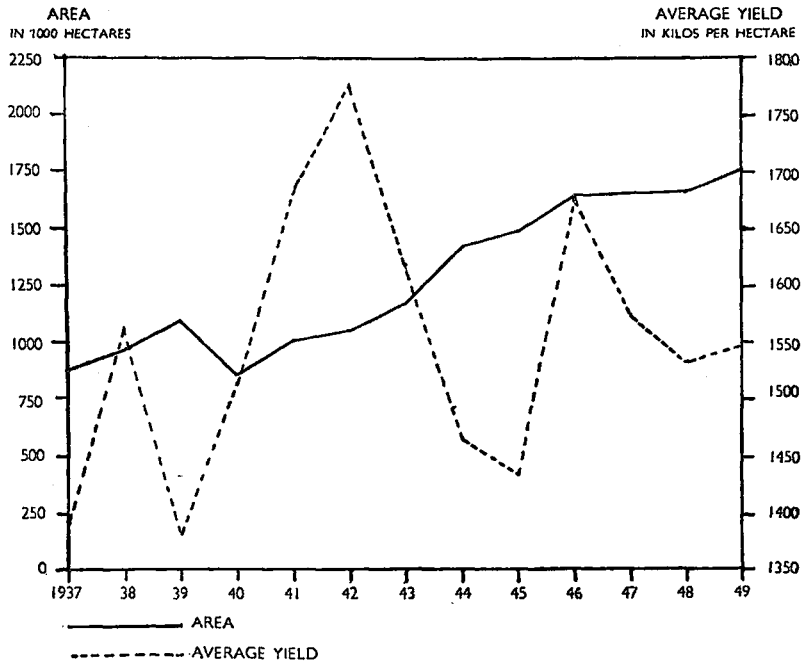
States	1945	1946	1947	1948	1949
São Paulo	677,934	973,006	838,456	832,650	781,899
Minas Gerais	450,965	506,311	517,240	532,122	629,762
Rio Grande do Sul . . .	373,624	628,494	566,607	515,621	547,762
Goiás	225,403	191,612	192,042	160,155	205,740
Santa Catarina	83,162	80,871	79,500	81,349	72,641
Paraná	45,264	71,286	77,412	116,339	69,757
Rio de Janeiro	73,307	47,079	49,171	39,203	63,249

Source: Ministério da Agricultura, 1950.

There are two different types of rice production, i.e. with and without irrigation. Without any doubt the irrigated rice field gives the better results economically, but nevertheless more than 50 % is grown as 'dry' rice. This is not only the result of social economic circumstances, but is also caused by the topography of the country. In regions where the topographical conditions are more favourable, for instance in the State of São Paulo, irrigated rice predominates. On some farms cultivation is even mechanized. For irrigation slowly running water is preferred to standing

Diagram IV

RICE



water. The use of fertilizers is very limited, for this reason in Rio Grande do Sul after one or two crops the land is allowed a period of rest.

Where virgin forests are cut down, rice is considered to be a good first crop. It is planted between the stumps, after the seedlings have been grown on a primitively cleared piece of land.

There is a striking contrast between diagram IV, giving acreage and average yield per hectare for rice, and diagrams I to III. The area under rice increases continuously. This constant increase is to be found, roughly speaking, from 1913 on, when stimulation of the production first became noticeable. This is striking, because most of Brazilian products have their marked ups and

downs. Preston E. James even named various periods after the product in maximum production at a certain time thus, sugar cycle, citrus cycle, etc.

The diagram shows marked variations in the average yield in the period under discussion. These variations are caused not only by the precarious nature of 'dry' rice production, but also by pests. Locust plagues are not uncommon in the important rice-producing regions, and the damage wrought by these insects is only too well known.

According to figures from the International Institute of Agriculture the average yield per hectare in Brazil is very low. Taking 1946 which was a normal year as a basis of comparison, only Rumania had a lower average yield, nevertheless some of the varieties produce an excellent quality rice.

The product is sold to a large extent to local consumers. The State of Rio Grande do Sul is an exception to this rule, where production exceeds local consumption. For example in 1947, this excess was more than 5 million bags,[1]) of which approximately 2 million bags were shipped to other Brazilian States and 3 million remained for foreign export. The important part exportation [2]) plays in rice production in Rio Grande do Sul, has brought into being the 'Instituto Riograndense do Arroz' (I.R.G.A.). This institute has the power to issue regulations controlling the internal rice trade, and to fix prices and special taxes on rice exports.

There are large possibilities for the expansion of rice production. As yet only in Rio Grande do Sul do the authorities think it possible to expand the acreage 30 % by irrigation projects. Goiás and Mato Grosso, some suppose, will become important rice-producing regions also when transportation facilities improve. The big São Francisco Valley project might also lead to an expansion of production.

[1]) A bag of hulled rice is 60 kg.

[2]) Products sold to other States or other countries are classed as exports.

Sugar

Sugar cane was introduced in Brazil in 1532 and planted in the surroundings of present day Santos. In the second half of the same century a sugar boom started in the northeastern parts of the country. The wealthier people settling in Bahia and Pernambuco had enough financial backing to install the plants requiring a large capital investment and to import black labour to work on the sugar plantations. The rapidly expanding European sugar market made it possible for cane planting to spread in a short time. This occurred principally in the forest zone of Pernambuco State and around the big bay on which Salvador is built in the State of Bahia.

Sugar was the leading export commodity until about 1830. Then it was surpassed by coffee and it held the second place until the end of the nineteenth century, excluding 1871 in which year cotton exports took second place.

Nowadays Brazil is still one of the five foremost sugar-producing countries of the world, but at the present time, Brazilian sugar is produced almost entirely for home consumption.

Sugar cane is planted in every State of Brazil, but only a few States are important as sugar producers. As in the case of cotton production, two different zones can be distinguished in sugar production. The Northern zone: Pernambuco, Bahia, Alagoas and Sergipe (zone I), and the Southern zone consisting of the States of Minas Gerais, Rio de Janeiro and São Paulo.

States	Total agricultural Area (in 1,000 ha)	Sugar cane Area (in 1,000 ha)	% of Total agricultural Area
Pernambuco (I) . . .	788	157	19.92
Minas Gerais (II). . .	2,762	144	5.21
São Paulo (II)	4,456	131	2.94
Rio de Janeiro (II) . .	356	86	24.14
Bahia (I)	801	36	4.49

Source: Ministério da Agricultura.

The above table shows the relative importance of sugar cane production in the five more important States, in 1948.

Brazilian sugar industry before World War I suffered under the increasing competition from other parts of the world. Beet sugar production was on the increase, Cuba financed by the U.S.A. had its sugar industry modernized, Java under the Dutch had a modern sugar industry, as had Hawaï also.

Pernambuco, the traditional Brazilian centre of sugar production lost its supremacy as a result of the Brazilian sugar policy of that time. This policy artificially stimulated production in other parts of the country.

In 1906 the Brazilian sugar industry refused to join the Pact of Brussels, as they feared the competition of beet sugar. Instead they followed a policy of artificial high prices within the country itself, and of dumping in foreign markets. As a result of this policy the industries in São Paulo, Minas Gerais and Campos which are situated nearer to the big consumption centres in southern and southeastern parts of the country, multiplied their production in order to supply those centres.

The outbreak of World War I averted a crisis, since sugar could be sold at high prices during the war. As soon as war was over and the countries that suffered from it recuperated, the competition, principally of beet sugar, was heavily felt again in Brazil. In the meantime the industrial installations had been modernized, production had been further expanded, especially in the southern zone, and 'over-production' came about. Several attempts were made to improve the situation, but results were poor. The northern district suffered especially. Economic life in Pernambuco depending largely on the sugar industry as it does, the government was forced to take action to alleviate the situation.

To control production and to preserve an equilibrium between the sugar-producing zones in the country, in 1933 the government created a cartel, the 'Instituto do Açúcar e do Alcool'

(I.A.A.), the Sugar and Alcohol Institute. This institute assigns production quotas to the respective factories, fixes sale prices and sells surpluses in foreign markets.

The next table shows sugar production during the last decade in comparison to some earlier figures.

It should be borne in mind that Brazil has two different types of sugar factories, known in the country as 'engenhos' and 'usinas'. The 'engenhos' are primitive types of factories where low-grade sugars are produced in 'open kettle'-mills. The I.A.A. has forbidden the founding of new 'engenhos', but production in those existing is uncontrolled. It is estimated that about fifty thousand 'engenhos' are still operating, the greater part of them in the State of Minas Gerais. Exact production of 'engenhos' sugar is not known; the Institute of Sugar and Alcohol estimates production as is shown in the next table. To stimulate production of the better qualities, the I.A.A. decided that 'engenhos' which modernize their production system can be considered as 'usinas' and therefore receive a quota with its attendant benefits of price support.

Production of Sugar, (in bales of 60 kilos)

Year	'Usina' sugar	'Engenho' sugar	Percentage 'Usina' sugar
1925/'26	5,282,071	7,207,291	42.3
1930/'31	8,256,153	8,739,922	48.6
1935/'36	11,841,087	6,059,112	66.2
1940/'41	13,511,832	7,054,869	65.7
1941/'42	13,839,083	7,042,836	66.3
1942/'43	14,759,017	6,788,800	68.5
1943/'44	15,314,442	6,344,300	70.7
1944/'45	14,896,924	5,342,000	73.6
1945/'46	15,417,553	5,741,915	72.9
1946/'47	18,352,339	6,335,318	74.3
1947/'48	22,622,512	—	—
1948/'49	23,578,876	—	—

Source: Anuário Açucareiro.

Not only sugar is manufactured from sugar cane: a considerable alcohol industry has developed, due to regulations requiring gasoline importers to mix a certain percentage of alcohol from the domestic industry with motor fuel. These regulations were made to improve the balance of payments which was unfavourably influenced by increasing purchases of gasoline. During wartime, when export difficulties existed and Brazil experienced a shortage of motor fuel, production of dehydrated alcohol was stimulated still further. The next table gives some data.

Year	Alcohol 74–97.5%	Dehydrated alcohol above 99.5%	Total production in litres
1930/'31	33,291,642	—	33,291,642
1935/'36	54,298,819	7,739,791	62,038,610
1940/'41	59,021,592	67,599,396	126,620,988
1944/'45	89,348,405	30,421,796	119,770,201
1945/'46	80,390,662	26,120,105	106,510,767
1946/'47	80,934,291	36,103,119	117,037,410
1947/'48	82,326,878	61,516,520	143,843,398
1948/'49	92,206,270	75,126,315	167,332,585

Source: Anuário Açucareiro, 48/'49.

Although to the visitor sugar consumption might appear very high in Brazil, judging from the innumerable little cups of black coffee with several spoonfuls of sugar consumed all hours of the day, statistical data show that the use of the better sugar types is relatively low. Figures published by the Sugar and Alcohol Institute are shown below.

Denmark	56.0 kg per capita yearly	Norway	35.6 kg per capita yearly
England	51.2 „ „ „ „	Belgium	32.6 „ „ „ „
Sweden	49.1 „ „ „ „	Finland	30.4 „ „ „ „
Switzerland	43.1 „ „ „ „	Netherlands	29.4 „ „ „ „
Ireland	41.2 „ „ „ „	Brazil	26.8 „ „ „ „

The variations in sugar sonsumption within Brazil are very great. For example, consumption in the State of São Paulo is about 38

kilo per capita yearly, while in Piauí it is 3.5 kilo, in Espírito Santo 4.1, in Santa Catarina and Ceará 6.5. Most probably in the States with the lower figures the use of 'rapadura' and 'mascavo', low-grade substitutes for sugar from the 'engenhos' are widely used. The price of refined sugar being high this is not surprising.

Sugar consumption has continued to increase, rising from 12,000,000 bags[1]) in 1940/'41 to 18,000,000 in 1948/'49. This total was not consumed directly as sugar, part of it reached the consumer via the fairly large industry of sweets, jams which is on the increase.

Apart from the manufacture of sugar and alcohol, a percentage of the sugar cane is used for the manufacture of alcoholic drinks. The 'fábricas de cachaça' are widely spread over the country, and the product ('cachaça' or 'pinga' – a kind of rum) seems to be used more than is apparent at a first glance. Exact figures are not available.

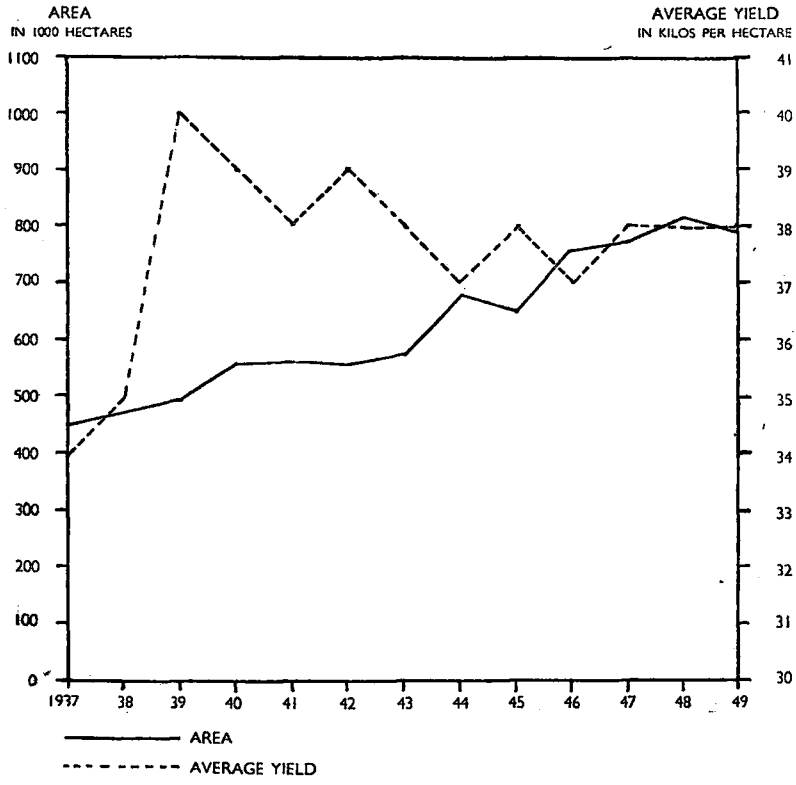
Taken as a whole the growing of sugar cane and the manufacture of sugar still show a poor efficiency. In the last decennia new varieties have been tried out and are now widely used. Amongst others several P.O.J.-varieties from the former Dutch East Indies, seem to have had some influence.

Not only are new varieties being brought into production, other improvements such as the greater use of fertilizers and irrigation, are also being practised. Much has still to be done, however, as can be deducted from some of the words the president of the I.A.S. spoke when he took over the presidency in 1951: "Our yield per acre is mediocre when compared with other producing centres, where irrigation, fertilizers, mechanization, selected varieties and industries with large capacities have been brought about by the full economic knowledge of the producers... the area in Brazil could be reduced with a third part of it and

[1]) A bag contains 60 kg.

Diagram V

SUGAR CANE



still have the same production index as far as sugar production is concerned."

Diagram V shows the acreage and the average yearly yield in the last twelve years. The steady rise of the sugar area gives the impression that production under present day conditions seems profitable. The decline in average yield can probably be explained by the fact that the newly occupied soils are less suited to the crop. The decline of 10 % in a 9 year period seems less important, when compared with the 14 % rise during 1938–'39.

Manioc (cassava)

Manioc is native to Brazil. Two varieties are grown in the country: 'mandioca' (manihot utilíssima) and 'aipím' (manihot dulcis), the more important difference between the two being, that the first has poisonous roots, containing cianic compounds, whereas the second has non-poisonous roots. The poison can be eliminated by various methods such as soaking the roots in water for several days, or by drying the roots and roasting them. In Brazil, the white powder prepared from the roots is called 'farinha de mandioca' or 'farinha' for short. It can be stored for a long time. It is used at every Brazilian dinner or lunch, sprinkled liberally over the food. 'Farofa' is a rough powder, used as a substitute for bread at meals. As 'farinha' is almost pure starch, the ways in which it can be used as a food are almost unlimited. The Advisory Committee on Nutrition gave amongst others the figures shown in the next table, demonstrating a comparison between the more important constituent parts and calories in manioc meal and other foodstuffs.

Composition per 100 grams digestible food [1])

	Water %	Proteines (g)	Fat (g)	Carbohydrate (g)	Calories
Beef	52	12.9	33.5	—	353
Rice	12	6.8	1.0	78.1	349
Beans (Braz.) . .	8	21.5	—	36.6	260
Manioc meal . .	10	1.8	0.4	81.7	338
Potatoes [2]) . . .	78	2.0	—	16.2	73
Pork (light) . . .	19	6.2	70.7	—	661
Wheat flour [3]) .	12	12.5	2.0	59.7	306

[1]) Technical Advisory Committee on Nutrition, London 1943. Mineral and vitamine values are not mentioned being of no importance for this comparison.

[2]) Stored potatoes.

[3]) Milling 80%.

On several occasions the law has stipulated that manioc meal to a certain percentage must be mixed in wheat flour for the baking of bread, so to reduce wheat imports. As a human food manioc is very important in Brazil, but it also has a variety of other uses. It is used as a feed for dairy cattle and also finds a use in the production of starch, alcohol and glycerin. Cellulose industries can use manioc as a source of raw material also.

The next table gives the 5 States in which manioc production is relatively important.

States	Total agricultural area (in ha)	Manioc (in ha)	%
Bahia	800,682	133,207	16.63
Santa Catarina . . .	541,371	80,807	14.93
Pernambuco	787,921	82,673	10.41
Rio Grande do Sul .	1,914,775	105,673	5.52
Minas Gerais . . .	2,762,068	85,352	3.09

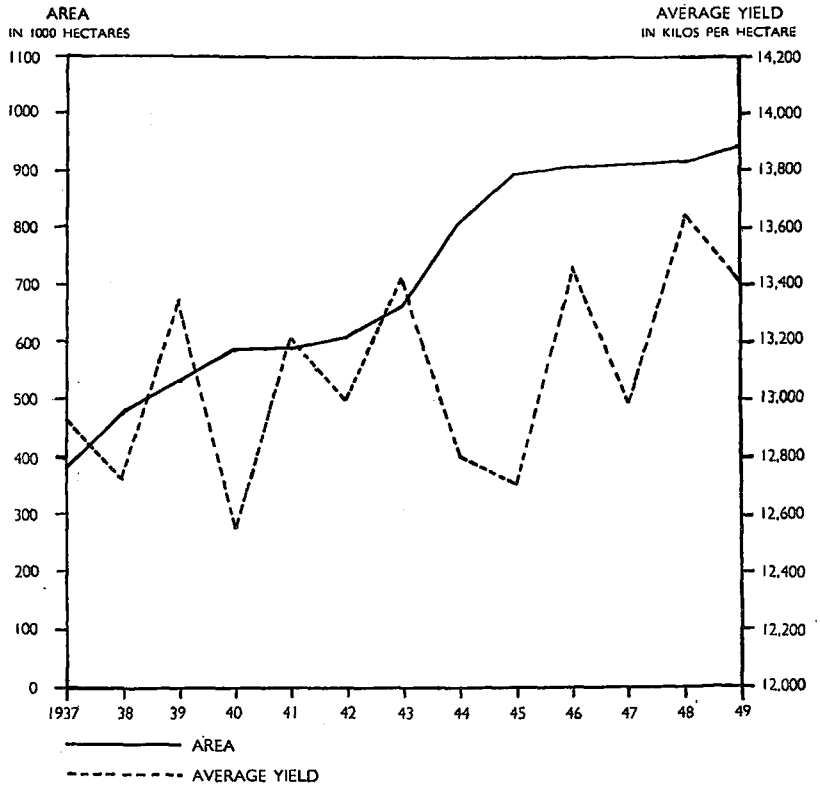
Source: 'Anuário Estatístico do Brasil', Ano X, 1949.

Although Brazil is the largest producer in the world, exports of manioc products were of importance only during certain years, never exceeding 10 % of the total on the world market. Before the war the Dutch East Indies were the chief suppliers of the world with manioc products. The main question therefore – whether or not Brazil will be able to find a better position as an exporter – is the possibility of present day Indonesia, regaining her previous position.

Some circles in Brazil are afraid that the stimulation of wheat production may adversely affect the production of manioc. This may be true to a certain extent, but as long as the country is producing mainly for home consumption, and as long as the Brazilian diet remains unchanged, the production is not likely to fall below a certain level. Should possibilities arise to compete on the world market, production might be increased considerably,

Diagram VI

MANIOC



climate and soil being suited to the crops and the plant not being subject to serious diseases. 'Broca de mandioca' (a borer) and viruses are known, but the damage they do is not great.

Diagram VI illustrates the acreage under manioc and the average yield per hectare in recent years.

Beans

Beans are, next to rice as the most important part of the Brazilian diet, eaten twice a day the year round. 'Feijoada' is one of the

most characteristic Brazilian dishes. It is prepared with jerked beef, salt pork and sausages and sprinkled over with 'farinha' (manioc meal).

Before the first world war large quantities of beans had to be imported, but today the production covers national consumption and occasionally permits exportation. The exported quantities vary greatly from year to year.

Beans are grown in most Brazilian States, but only in a few is the crop of importance.

States	Total agricultural acreage (in ha)	Under bean cultivation	%
Paraná	1,116,486	207,104	18.55
Ceará	752,284	112,753	14.99
Pernambuco	787,921	68,958	8.75
Minas Gerais . . .	2,762,068	386,713	14.01
Rio Grande do Sul	1,914,775	143,580	7.50
São Paulo	4,456,345	276,405	6.20

Source: Anuário Estatístico, Ano X, 1949.

The cultivation of beans is carried out in two ways: about half of the beans are planted in maize fields and between sugar cane or young coffee; the other half are grown as a single crop. As beans mature very rapidly i.e. within 2 to 4 months, two plantings a year are possible in most regions.

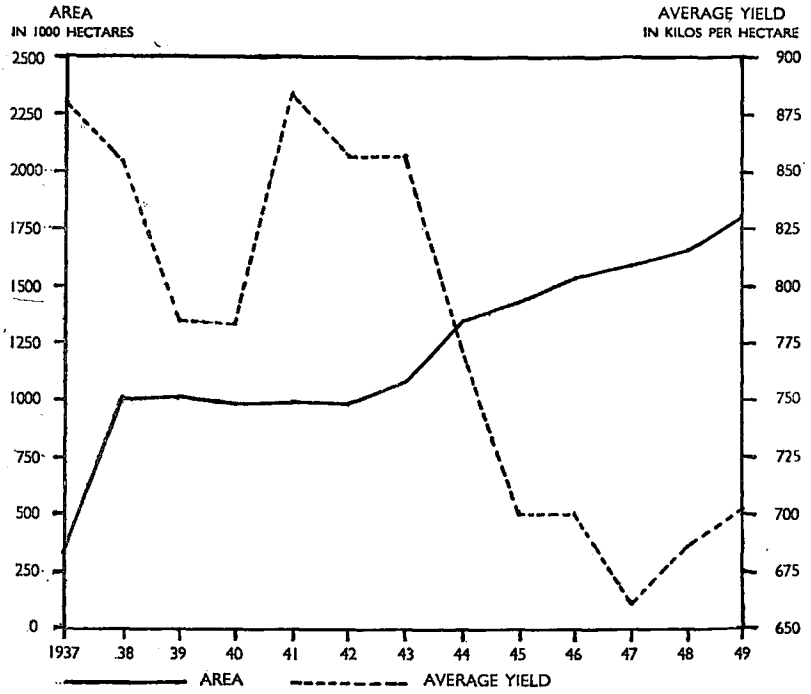
In the South the most popular variety is the black bean 'feijão preto'; other varieties of lighter colour, which can be stored better are also produced.

The methods applied in cultivating the crop are rather primitive. Fertilizers, seeders and threshers are only used in rare instances. Production has been slightly over a million tons per annum in recent years.

Diagram VII gives at a glance the acreage under beans and the average yearly yield. The difference in yield should be explained principally by differences in climatic conditions.

Diagram VII

BEANS



Potatoes

In Brazil potatoes are not such an important item of food as in the U.S.A. or Europe. They are almost exclusively consumed by the higher income groups. Production is limited to a few States as shown in the next table.

In the State of Bahia European immigrants recently started to grow potatoes as an experiment.

Production, although theoretically not far from covering the Brazilian needs, is in practice insufficient each year, especially in the months of September to December. The two yearly harvests

States	Agricultural area (in ha)	Production (tons)
São Paulo	53,106	209,421
Rio Grande do Sul	46,858	202,009
Paraná	29,681	162,973
Santa Catarina . .	8,607	35,060
Minas Gerais . . .	9,718	49,125

Source: Ministério da Agricultura, 1949.

take place in the months of December/January and April/June and losses, due to transportation difficulties and lack of storage facilities, are extremely high. At least 25% of the production is not suitable for human consumption. This is why since the end of the second World War potatoes have had to be imported yearly from abroad, the quantities varying between 16 and 55 thousand tons, which represents only from 3 to 10% of the national production.

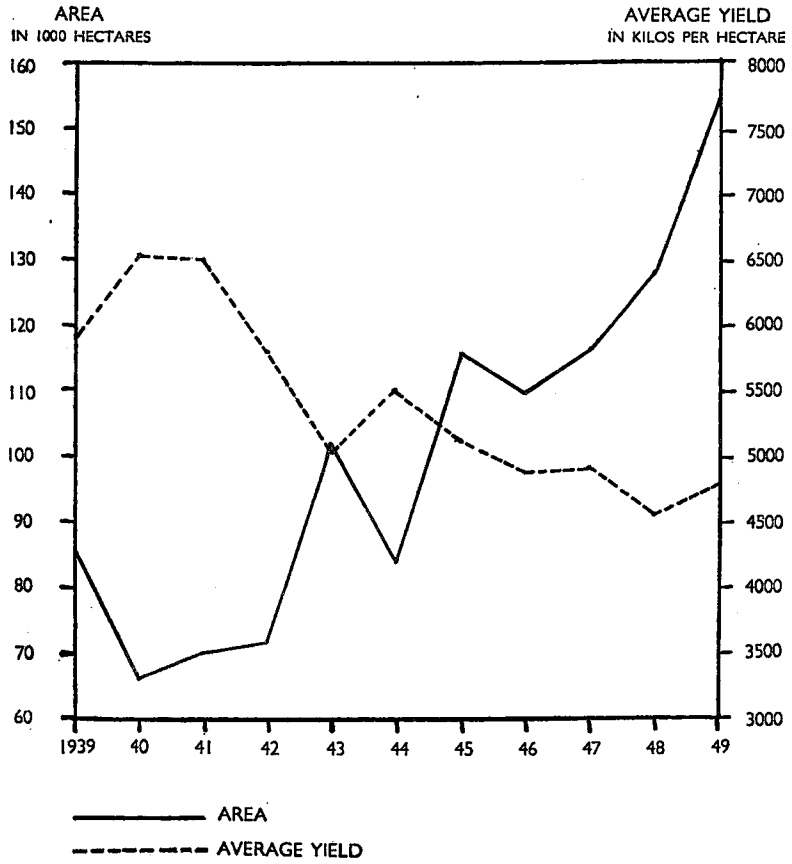
Climatic conditions are not always favourable to the crop. The producers use generally primitive methods of cultivation and find many difficulties in fighting dangerous diseases, principally phytophtora and 'murchadeira'. The climate is very conductive to a rapid spread of phytophtora and other diseases which thus can be considered one of the main obstacles to improved production.

Another difficulty is to provide the producer with seed potatoes from reliable strains within the country. Much work has been done already in this field, especially during the last war, when it was impossible for Brazil to import seed potatoes from Holland and Germany. Experts think it impossible in practice to grow enough seed potatoes in the country itself, partly because of climatic influences, partly because specialized labour is required. Importation was resumed immediately after the war.

Diagram VIII shows the acreage under potatoes and the average yearly yield per hectare in the last 12 years.

Diagram VIII

POTATOES



Tobacco

Tobacco in Brazil was already mentioned by authors in the 16th century. Today it is one of Brazil's important export crops, and the country is the fourth tobacco producer in the world.

The plant is grown in several States in Brazil, but only four of them are of importance; of these Bahia and Rio Grande do Sul play the leading rôles in export. Minas Gerais produces much

tobacco for home consumption and in Santa Catarina production both for home consumption and export is increasing. The next table shows the relative importance of the crop deduced from the total acreage of arable land and the area under tobacco.

Year	Total agric. area	Area under tobacco	%
1945	15,275,888	143,565	0.94
1946	15,610,872	136,495	0.87
1947	15,854,141	134,211	0.85
1948	16,219,460	143,877	0.89
1949	—	145,447	—

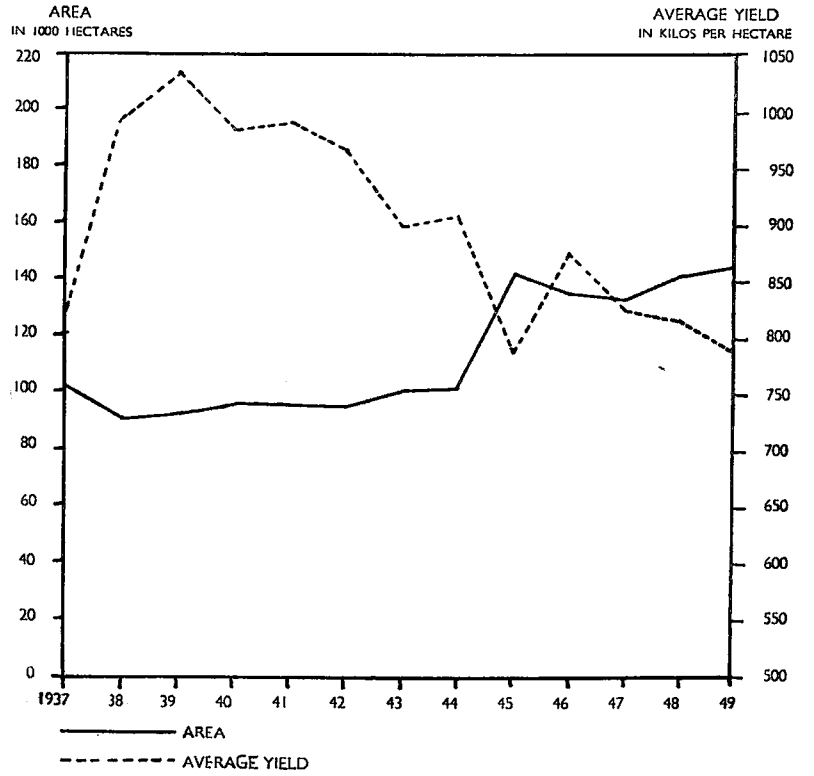
Source: Anuário Estatístico, Ano X, 1949.
Ministério da Agricultura, 1949.

The yearly crop varies between 100 and 115 million kilos. Bahia was the most important tobacco-producing State until 1938, when it was surpassed by Rio Grande do Sul for a short time, Now again it has taken the lead.

There are big differences in the qualities of tobacco grown in the principal producing States. Bahia tobacco is exported for the manufacture of cigars and is used principally as a filler, mixed with other types. As a binder and as a wrapper it is used mainly in the Brazilian industry. Before World War II Germany and Holland were the principal buyers of Bahia tobacco. After the war, Spain became a purchaser; Holland took up buying once more and Germany will probably join in the near future. Rio Grande and Santa Catarina are producing tobacco which is better suited to cigarette manufacture. Stimulated production in the States of Rio Grande do Sul and Santa Catarina in recent years made it difficult to sell the export surpluses in spite of increased national consumption. Probably Germany will be a future buyer of these tobaccos. Some of the Santa Catarina tobacco is used in cigar manufacture as a binder and even as a wrapper in the cheaper types of cigars. Minas Gerais produces a poorer type of tobacco.

Diagram IX

TOBACCO



This finds a use in the production of the rope-like twist which is the chewing tobacco of the rural zones.

Diagram IX shows acreage and average yearly yield in recent years. Those connected with the trade in Bahia explain the decline in average yield as a result of lack of care of the soils and the approaching end of the reserves of land suited to tobacco growing.

Cocoa

The Cocoa plant is indigenous to the Amazon Valley and grows principally in the State of Pará. When Europeans came into the country, the natives already knew how to use the plant, in their own primitive way.

Cultivation began in 1746 and during colonial times it gained importance, but exportation did not increase until the 19th century.

Owing to plant diseases the importance of Pará as a production area faded and by the 18th century a new centre was founded in Southern Bahia, in the valleys of the Mucurí, Contas, Pardo and Jequitinhonha rivers. These regions, where a high humidity and high temperature prevail, grow about 96% of Brazilian cocoa. The rest is produced in Pará and Espírito Santo.

Brazil now comes after the African Gold Coast in cocoa production. In the early years of this century Brazil was second to Ecuador, but took the lead in production in 1911 until the expansion of the Gold Coast production took place in 1920.

Low prices during the thirties brought a decline in cocoa plantations in Brazil, due to large quantities of African cocoa being put on the market at a low cost. A peak production of almost 140,000 tons was reached in 1937, but subsequently declined. After the recent war the situation improved spectacularly. West African plantations were seriously infected by a dangerous disease 'swollen shoot', and production declined. In the meantime world consumption increased, not only by the increase of world population but also by augmented consumption, due to a higher consumption per capita. This was particularly noticeable in the U.S.A., probably as a result of higher incomes. Prices rose sharply after the war and are at present high enough to make production very profitable.

As cocoa is a highly speculative product and as the world market shows violent fluctuations, it will be clear that the small farmer suffers through lack of financial resources. For this reason

the 'Instituto de Cacao da Bahia' was established in 1931. The principle purpose was to establish a rational system of marketing for the benefit of the growers. Apart from this, the Institute established warehouses, provided credit facilities, built and maintained roads. The power of the institute changed several times during its existence. At times it exercised control over prices and sales quotas whilst from 1943 to 1946 it even had the monopoly of buying and selling. The institute still controls business to a large extent, particularly with regard to export prices.

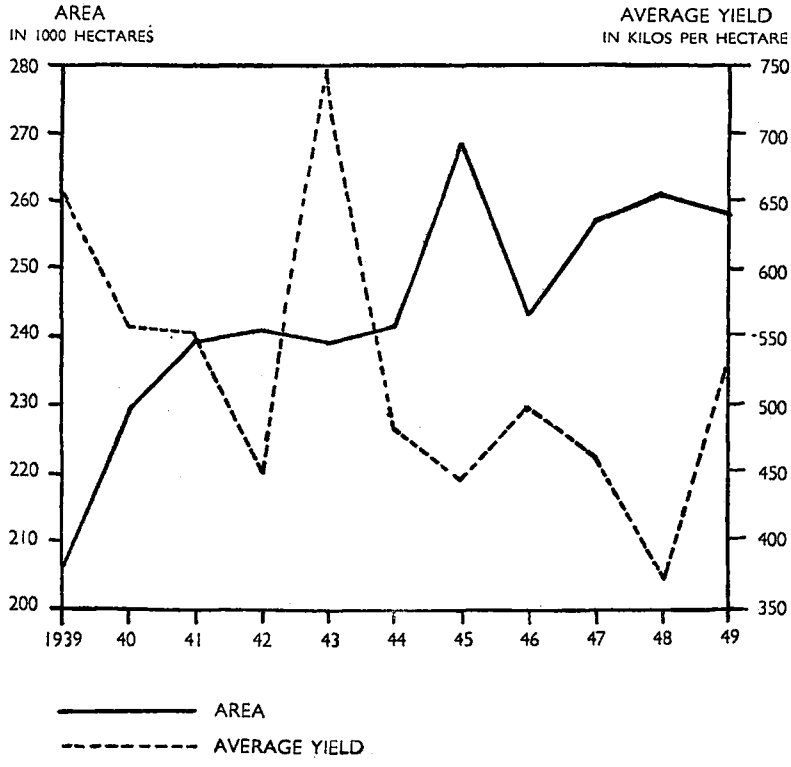
Cocoa is exported to the U.S.A., Holland, Switzerland, France and Germany. Industrialization within the country itself was mainly stimulated during the war. A protective tax was imposed on cocoa beans when exported, so the national industry could work with cheaper material. Not only do they stand to gain over foreign competitors by being free from freight payment to Europe or to the U.S.A., but the tax gives an extra advantage of over 10 %. Even with this advantage however, the industries founded from 1920 onwards are still fighting under difficulties. One of the bigger exporters, Joanes Industrial, has built up a thriving industry which shows that possibilities for industrialization in Brazil exist. This undertaking, founded after the war with a capacity of 8,000 kg of cocoa butter daily, is by no means the biggest in the country.

In Brazil the cocoa butter is used in the chocolate industry whilst from the cake theobromine and cafeine are extracted. The principal producer of the latter products is Orquima Indústrias Químicas Reunidas in São Paulo City. The larger part of the cocoa butter is exported to North American and European markets.

Brazilian cocoa has a very special flavour which proves to be a drawback in the cocoa butter industry and in the chocolate industry also. The leading countries in the manufacture of chocolate and cocoa butter always use mixtures of cocoa from different countries, so obtaining a blended product of better taste. This,

Diagram X

COCOA



however, is impossible for Brazilian industries, since the government impede importation of cocoa from abroad.

In 1950 the local industries bought more than 20% of the total cocoa harvest, exceeding all previous years. Partly this was due to the possibility of 'compensating' the processed products by which it was possible to sell at prices, 30–40% below the normal price. Agio on the imported goods compensated the difference. The compensation business being prohibited now, the industry might meet difficulties in the near future.

Diagram X shows acreage and average yearly yields in recent years.

Varieties from the 'Forastero' type are widely spread in Brazil. Those from the 'Criollo' type are also known, but they are not planted so extensively.

Brazilian experts consider the best way of planting cocoa is to clear the forest, but not to burn it. After this, auxiliary shade trees such as bananas are planted with the 6–12 months old seedlings in the rows of the bananas at the same time. Permanent slower growing shade trees are planted at regular intervals between the rows. One of the best known shade trees in Brazil is Erithrina velutina.

The older plantations differ widely from the scheme above mentioned. Usually the forest was cleared and burnt, whereas the trees resisting the fire were left as shade trees. This resulted in an extremely uneven spread of shade with parts devoid of shade bordering overshadowed patches. In this system, planting in rows was impossible, due to fallen trees. On the hilltops the forest usually was left intact in order to preserve rainwater.

As hygienic measures are not taken, phytophtora is a rather prevalent disease. In Bahia a loss from 10–15% due to phytophthora is said to be normal. Other diseases are of less importance in Bahia; 'witches broom' is known, but its frequency is relatively low.

The crop ripens from March to November, with a peak in the last three months of this period. In the first three months, called 'temporão' (March to June), a gathering once a month is sufficient; in the 'safra' (September to November) it is necessary to gather once a fortnight.

The pods are opened on the field and the beans, together with part of the pulp are either shipped in canoes along the small rivers or carried by donkeys to the 'fazenda'.

As a curiosity it can be mentioned that the standard unit for unfermented cocoa beans used, is the 'caixa' (case). The origin

of this unit is the empty case in which four tins of oil are shipped to the interior.

On the fazenda the beans are fermented in open wooden boxes generally without any scientific control. After the fermentation the beans are dried either in the sun or artificially. Sun drying is considered to be better, as in this way the beans are considered to lose less flavour. The pulp is not washed away after the fermentation, so dried pulp rests always stay on the beans. This is the reason of the special appearance of the Brazilian cocoa and to this may be attributed the smoky taste which some European buyers in particular do not like. However, another origin of this smoky taste is also possible, i.e. the way of sun drying, which is used on some fazendas. There the beans are dried on the flat roofs of the labourer's houses, thus getting into contact with smoke, curling up through the chimneys, the women using woodfires all day long for their housekeeping.

The dried pulp rests on the beans are without any doubt the cause of the strong smell of acetic acid in the containers where the cake (residue of the cocoa butter manufacturing) is heated.

In Uruçuco, not far away from the cocoa harbour Ilheus, an experimental station has been founded in order to improve several facets of the production. On this station new varieties are grown and tested and methods in fighting diseases are studied, shade problems, preparation of the soil, fermentation, etc. are given careful consideration. Furthermore, the station provides farmers with planting material.

Although much could be improved in cocoa production, handling and processing, the financial results after World War II give the impression that these improvements are unnessary. In the long run, however, this might prove to be a mistake.

Wheat

At the end of the eighteenth century, Rio Grande do Sul produced substantial quantities of wheat. The crop was shipped to Rio de Janeiro and to the regions of the Rio de la Plata. In 1811 a rust epidemic destroyed this cultivation. In later days immigrants, mainly of Italian and German origin, began to grow wheat to supply their own needs. The authorities, both Federal and State, attempted several times to revive interest in wheat growing. Before the war the latest attempt was made in 1937, when President Vargas established experimental stations and seed multiplication fields in several States and requisitioned flour mills to absorb the domestic crop at officially fixed prices. At the same time it was made a law that wheat flour for bread had to be mixed with other flours, such as rice, manioc and corn. After an agreement with the Argentine was reached whereby Brazil obtained advantages for the sale of mate in the Argentine market (restriction of new plantations in the Argentine), the practice was discontinued. The discontinuation of what could be called the wheat policy in Brazil, was one of the main reasons why a normal development in wheat production within the country before the war was impossible. The lack of wheat varieties suited to the country was also an important factor. In different sectors of the country climates vary considerably. Rio Grande do Sul has a high humidity during the early summer months which sometimes delays planting. Santa Catarina and Paraná have their wet months in December and January, so the crops must be harvested early. Northern Paraná, São Paulo and Minas Gerais require drought-resisting varieties, as the rainy hot season is followed by a dry winter.

Lack of storage facilities, shortage of capital, transport difficulties and lack of experience of cultivation were other serious factors which retarded development.

Since the importation of wheat means a yearly drain on foreign exchange resources, in recent years Brazil has made fresh efforts to extend its own production.

During the five years preceding the Second World War wheat was grown on about 160,000 hectares in Brazil, mainly in Rio Grande do Sul, but to some extent also in Santa Catarina and Paraná. In 1946 the acreage showed an increase of about 94% in 10 years and the crop had grown in volume from about 139,000 tons to 213,000 tons.

The next table shows the latest obtainable figures of acreage and yearly crop:

Year	Acreage in 1,000 ha	Crop in 1,000 tons
1937	160,000	139,000
1938	168,000	136,000
1939	208,000	102,000
1940	200,000	101,000
1941	272,000	231,000
1942	276,000	215,000
1943	292,000	223,000
1944	328,000	171,000
1945	316,000	233,000
1946	301,000	213,000
1947	392,000	359,000
1948	536,000	405,000
1949	630,000	438,000

Source: Ministério da Agricultura.

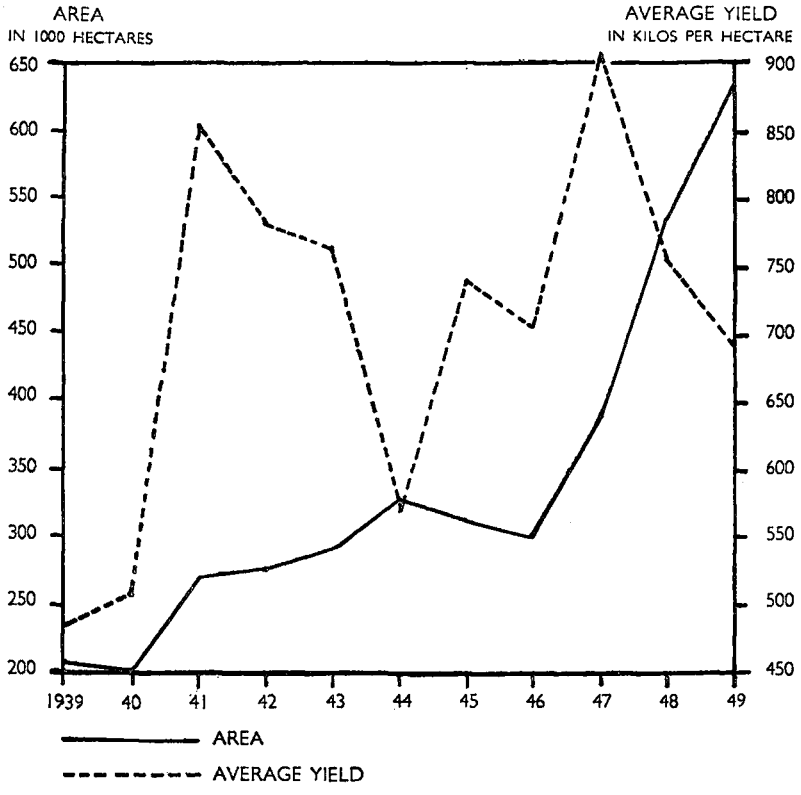
High wheat prices after the war further stimulated wheat production, hence about a third of the home consumption was covered in 1950.

In Rio Grande do Sul, where most of the land is divided into large ranches, large areas sufficiently level and free of trees or big stones are suited to large-scale mechanical wheat cultivation.

A Swedish geneticist, contracted at the experimental station of Bagé, near to the Uruguayan border, developed new wheat varieties giving better results. The flour mills contributed funds to make possible studies by French experts on the baking qualities of Brazilian wheat flour and on mixtures with other

Diagram XI

WHEAT



flours. The government imported mechanical equipment and provided technical assistance to the growers. As a result wheat production increased rapidly. Costs of production, however, are high and it is yet to be seen if the product will eventually compete with the lower priced Argentine wheat. The policy of the government should be considered of utmost importance in this matter, and of still more importance perhaps the continuity of that policy.

Mate (Herva-mate)

Mate is a typical drink, especially popular in the southern part of the country as also in other South American countries. In the U.S.A. sometimes it is called 'Brazilian tea'; this name originating from the method of preparing the drink. The dried leaves of Herva-mate (Iles paraguayensis) are put in a gourd which often has silver mounting. Boiling water is poured on the leaves and the infusion is drawn up through a silver tube, called 'bombilha'. The gourd with the bombilha is passed from hand to hand and, when the tea is finished, new boiling water is poured on the leaves. As the drink is taken without sugar and has a rather stringent taste, foreigners prefer to drink it after the water is replenished for the second or third time. The tea is said to have diuretic qualities and therefore it is a corrective for those living principally on a meat and bread diet. It tends to soothe rather than to stimulate the nervous system.

Mate is indigenous in Brazil but cultivation is unknown in the country. In the Argentine plantations exist in Missiones Territory. The germination of the seed was formally the big difficulty. It was found however, that a warm-water treatment improved germination considerably.

In Brazil, the gathering of the crop from wild trees along the Paraná river is done in a primitive way. Branches are cut from the trees, hauled to a drying shed and, after the branches have been tied into bunches, the leaves are dried over a small fire and then beaten off. A crude toothed wooden wheel is rolled over the leaves until they break up into small particles. The product is then sacked and shipped to market. In the central markets the leaves are crushed again, cleaned, graded and packed for home consumption or export. The average exportation of mate nowadays is about 48,000 tons, the Argentine being the most important buyer. Brazil is trying to develop markets for the product in Europe and the U.S.A., but so far results are not very promising.

Tea

In colonial times tea was grown in Brazil, mainly in the State of Minas Gerais, but production declined and before the first world war practically all tea was imported. Japanese immigrants took up the cultivation in the State of São Paulo in 1920 and Brazil, being a coffee-drinking country with very little consumption of tea, produced enough twenty years later to have export surpluses every year. The production is small as is shown in the next table.

Production (in tons)

1945	409
1946	744
1947	720
1948	676
1949	703

Fruits

Brazil is a large producer of a variety of tropical and sub-tropical fruits. Oranges and bananas are leading export fruits.

Oranges

Before 1920 Brazil produced scarcely enough oranges to meet local demand, although the tree was planted in several regions. Only from Bahia were oranges exported to other South American countries, mainly to the Argentine. Until 1925 the Brazilian oranges were unknown in European markets. In that year, after a vain attempt to enter the U.S. market, some experimental shipments were made to England and Germany. These first shipments were followed by serious attempts to export larger quantities to Europe, but the attempts made headway only after modern standardization and marketing methods were introduced.

The government constructed three packing houses, four privately owned warehouses were also built. Machinery for grading,

washing, stamping and boxing was imported, which produced more confidence in the Brazilian product on the European market. Exportation takes place mainly between June and December.

In 1949 production had risen to more than 36 million boxes.[1]) Exports in 1927 were only about 350,000 boxes, whereas in 1939 over 5 million were exported. The more important buyers were Great Britain, the Argentine, various European countries and Canada.

A number of varieties is grown in Brazil, the better known are 'Bahia' or navel orange, and 'pera'. The Bahia variety is seedless and is supposed to have its birthplace in the State of that name, where a well known legend concerning its origin exists: 'A female slave, being chastized by her owner for things she had not done, tried to retaliate when she was ordered to plant orange seed. Having occult powers, she bewitched the seed, proclaiming that it would never have any children. Hence the trees produced only seedless oranges'. Whether or not the story is in accordance with the theory on bud mutation will be left to geneticists.

When war broke out and export possibilities declined, the orange industry was seriously affected. At the same time a disease called 'tristeza' destroyed a large part of the trees grafted on sour-orange. Another disease, stem end-rot, damaged the good name the product had obtained before the war. The control of this disease is now being studied.

The next table gives some production figures of recent years.

Production (in 1,000 fruits)

1945	5,037,305
1946	5,272,104
1947	5,310,228
1948	6,129,180
1949	5,974,846

Source: Ministério da Agricultura.

[1]) 1 box weighs about 35 kilos and contains about 170 oranges.

Bananas

Bananas, next to oranges the most important fruit crop in Brazil, are grown on almost every farm in the country, except those in the regions where light frosts occur.

Many different varieties are grown in Brazil, but only the 'nanica' or dwarf banana (Musa cavendishii) is important for export.

Extensive banana plantations, producing for export, are found concentrated around the port of Santos in particular.

The production and exports in recent years are shown in the next table:

Year	Production [1]) (in 1,000 bunches)	Export [1]) (in 1,000 bunches)
1945	107,311	2,233
1946	117,207	5,230
1947	127,467	6,585
1948	136,291	8,165
1949	147,696	8,381

Source: Ministério da Agricultura.
Anuário Estatístico, Ano X, 1949.

[1]) 1 bunch = 20.00 kilos.

The Argentine is the principal buyer with England, also a consumer of importance.

Pineapples

The pineapple has its original home in Brazil. The fruit is grown in practically all the States of Brazil, Paraiba, Pernambuco, Minas Gerais and São Paulo being the most important producers.

Although the production is big, as is shown in the table below, and the flavour of the Brazilian pineapple is considered to be superior to some other types, only about 2% of the crop is exported, mostly to the Argentine and some European markets.

Production (in 1,000 fruits)

1945	74,906
1946	68,524
1947	69,028
1948	74,450
1949	81,658

Source: Ministério da Agricultura.

Other tropical and sub-tropical fruits

There is a large variety of tropical and sub-tropical fruits in Brazil. Advocados (Avocado pear), in Brazil called 'abacate', are grown throughout the country and in recent years commercial planting of hybrids, imported from Guatemala and México has been undertaken. In Brazil the fruit is largely used as a dessert in the form of mash rather than as a salad. There is some export, principally to the Argentine.

Papaya, in Brazil called 'mamão', is also very popular. It is grown almost everywhere and many varieties exist. The fruit contains a digestive constituent, papain.

The Mango, a magnificent tree, bearing masses of prune-shaped fruits, grows in the northern parts of Brazil and along the coastal strip. The taste is unique and differs very much with the variety.

Figs of very good quality are grown in São Paulo. They are consumed fresh, as the fig-growing region is too humid for drying them.

Guavas, in Brazil called 'goiaba', are processed in the canning industry; into a concentrated jelly this 'goiabada' with fresh cheese is the most common dessert in Brazil. The canneries in Pernambuco and Rio de Janeiro use thousands of tons of this fruit which resembles the quince. The tree grows wild all over the country.

Cashew (in Brazilian 'Cajú') grows wild along the coasts and the uplands of the northern and northeastern States of Brazil.

Its fruit is the well known nut, used at cocktail time. The apple-like receptacle, containing tanine, is eaten locally.

Guaraná is another typical fruit in Brazil. It grows only in a small region in the Amazonas, from which export of living seed or parts of the plant is forbidden. Production is very small, not covering the consumption needs of Brazil itself. The fruit contains a stimulant. A powder is made from it, which is used for preparing a beverage.

Peaches, pears, prunes and apples are grown in southern Brazil, but substantial imports are necessary to meet national demand for these fruits. The only non-tropical fruit grown on a large scale in Brazil is the grape. Rio Grande do Sul, the main producing State, grows wine grapes on about 18,500 hectares. Some 15% of the production may be consumed in the State of Rio Grande do Sul. The production of wine is declining however, as the wines do not enjoy a very good reputation. Dessert grapes are grown in the State of São Paulo, principally near Jundiaí and Campinas, but imports, mainly from the Argentine, enjoy a better market.

Fresh Vegetables

Fresh vegetables of good quality are scarce in Brazil. Around the city of São Paulo and near Rio de Janeiro truck gardening was started by Japanese immigrants. The main products are onions, garlic, tomatoes, green beans, and cabbage.

In the consumption centres prices for vegetables are very high, due to very poor marketing channels and transportation difficulties.

On the other hand demand is not very great, as the Brazilian diet includes comparatively few fresh vegetables.

Vegetable oils, waxes and gums.

Of at least forty different plants in Brazil which could be used as raw material for oil extraction, cotton tops the list. The cotton

seed oil production is over 50% of the total edible oil production. This is followed by castorseed oil and peanut oil as far as edible oil produced from cultivated plants is concerned. The wild-growing Babaçú, of which the pulp has much in common with that of the cocoanut is also a very important source.

Most of the other important oil-bearing plants, apart from coco, castro and tung, grow wild. There are numerous varieties in oil-producing palms of which the 'Dendê' (oil-palm) is the best known abroad. 'Ouricurí', 'Licurí', 'Licurioba' and 'Aricurí' are interesting palm varieties some of which grow on stony, very poor soils where no cultivated plant would thrive, others are drought-resistant. Potentially the wealth of varieties might be of value for the establishment of plantations within the country itself or abroad.

Drying oils are produced from tung, linseed and 'Oiticica'. Essential oils are obtained from native plants. Among these rosewood, from which 'bois de rose' oil is extracted, is the better known abroad. A variety of cultivated plants, such as the orange, lemon and peppermint, also supplies essencies.

The oil-extracting industry expanded during the second world war, but has since found some difficulty in coping with foreign competition.

Waxes are produced by various species of palms in the dry Northeast of the country. Practically all wax is gathered from wild-growing trees. Carnaúba is the best known, but there are a number of others producing waxes of similar qualities, such as the 'Ouricurí', the 'Licurí' and the 'Licurioba'. The industry is still largely primitive, although some modern processes have been in use since 1938. After the war the export of waxes met with some difficulty due to high prices in Brazil and due to the creation of factories for the manufacture of synthetic waxes in the U.S.A. and England. Germany had already started such an industry before the war.

There are several plants in Brazil which produce a gum which

could be used in the chewing gum industry such as Janaúba (Apocinacea spec) and Tabernamontana spec. The products are not gathered on a commercial scale, however.

The 'Instituto de Óleos', a federal institute, was established to study and further the production of oils and waxes.

Livestock

Livestock thrives in most areas in Brazil. The most important industries in this section are cattle raising and pig breeding.

Cattle were imported by early immigrants in 1530 in São Vicente (today's Santos). Most probably from these cattle, crossed with others, a definite native breed was evolved in the State of São Paulo, the 'caracú'. These small cattle fatten relatively quickly and provide good beef. They are not precocious, lack uniformity, but are adapted to climatic conditions and need little or no care, as they are highly resistant. The breed is not widely spread throughout the country. In the dry regions of the Northeast a similar type of cattle developed, called 'pé duro' (hard-feet). This is also a very hardy animal of small size, adapted to the poor diet of the semi-desert.

Most of the remaining Brazilian meat-producing cattle have Brahman blood in varying degrees. When, at the turn of the century, efforts were made to improve Brazilian cattle, better stock was introduced from Europe and the U.S.A. Most of these animals died, however, of tickfever called 'tristeza' in Brazil, scientifically: pyroplasmose and anaplasmose. This is a serious disease caused by micro-organisms conveyed by ticks, with which most of the country, except for the dry regions in the Northeast, is highly infected.

In the early part of this century Brahman or Zebú cattle were imported from India. Conditions in Brazil for Brahman cattle seem to be better than in India, because they thrive exceedingly. Their hardiness and their resistance to climatic conditions, tick-

fever, foot and mouth disease give them a big advantage over other types. For example the most important reaction of these cattle to foot and mouth disease is only loss of weight.

The crossing with Zebú made the cattle in Brazil bigger, more productive and more resistant. Pure Zebú strains are also bred such as Nellore, Gyr, Guzerat and Indo Brazil, the latter being a strain evolved in Brazil.

Brahman blood was not only used for beef cattle; a large number of dairy cattle also have a certain percentage. This might be the main reason why the fat content of the Brazilian milk is so high.

The pure strains of beef cattle with the exception of Zebú are not in evidence, except in Rio Grande do Sul where some herds of Shorthorn, Hereford, Aberdeen, Angus, Normandy and Devon are kept. Even in Rio Grande do Sul the Brahman breed is now increasing.

A large number of Dutch pedigree cattle are imported for dairy stock, mainly the black and white, although some farmers prefer the red and white breed because it is found to be less susceptible to insects and slightly more resistant to heat. The American Holstein Frisian type increased during the war, but specialists of all three nations agree that the Dutch type gives better results in Brazil since it is more resistant, has a longer production period and is less sensitive to defective nutrition. Since the war the Holstein Frisian is losing popularity, in favour of the Dutch breed.

Other dairy breeds such as the Brown Swiss, Jersey and Guernsey are of less importance in Brazil, but several herds do exist.

Beef cattle are found in almost every part of Brazil, from the Marajó island in the delta of the Amazon river, to the southern border. Not only are the abandoned arable lands put down to pasture, but the 'sertões' of Mato Grosso and Goiás have enormous natural pastures. These are the so-called 'campos serrados', savannas with scattered thickets of scrub forest and 'campos

limpos', pure grass lands which are both extensively used for cattle grazing.

Brazil is the third cattle-raising country in the world and the first in South America. Nevertheless the production of meat, hides and other products of animal origin is less than the Argentine production. Since 1940 it is estimated that the number of cattle has increased by more than 30%. This would mean that today's stock numbers some 46 million head of cattle.

Cattle are raised in a primitive way. The cattle are kept in herds and, except for branding and controlling the herd from time to time, are left alone. The herd lives practically free. An improved form is the splitting up of the larger herds into smaller ones, each headed by a pedigree bull. In some States the State government lend first-class pedigree bulls to the farmers in order to improve the stock. Most of the pastures have a vegetation of 'capím gordura', i.e. molasses grass (Melinis minutiflora), a rather poor feeding stuff for cattle. Other grasses are being introduced and amongst them 'Capím colonião' (Panicum maximum spec.), 'Capím kikuyu' (Pennisetum clandestinum), etc. give better results.

A shortage of labour and capital makes it necessary for the rancher to use the most primitive methods of treating the pastures, i.e. by burning them every few years in order to get rid of scrub and ticks. Capím gordura stands this treatment very well. The first rain after a pasture has been burnt changes the black surface into a lively green.

The ticks are a terrible pest in Brazil. The losses in production caused by these spider-like blood-thirsty little animals cannot be estimated. In recent years more advanced breeders began to use insecticides to fight ticks, but this practice is almost entirely used for dairy cattle.

Another pest which is endemic in most parts of Brazil is the 'bicho berne', which like a gad fly lays eggs under the skin of the animal. Larvae hatching from the eggs live in the flesh

of the animal until they are about 3 to 4 cm long. They then leave their host and enter another part of their evolution. It seems that the biological development of the bicho berne is a very interesting one. Scientists find that the fly that deposits the eggs under the skin is a normal blood-sucking insect, and the berne itself deposits its eggs in the proboscus of the fly. The damage caused by bicho berne is twofold. Firstly, there is loss of weight, not only because the larvae eat the flesh, but particularly because when the larvae grow bigger they create pains and nervousness in the cattle. Secondly, there is the damage done to the hide. Sometimes wounds are formed bigger than the palm of a hand when several larvae develop in the same place. The skin, after healing, shows weak spots in the hides, which greatly influence the quality of the leather. This is one of the main reasons why Brazilian hides do not find the best prices in the world market.

Calf mortality is very high in Brazil. In the State of São Paulo it has the minimum of 20% whereas Pará tops the list with 60%.

The slaughtering of about a 5.2 million head of cattle yearly gives a meat production of some 800,000 tons, which means only 18 kilos per capita yearly. Even when the quantity of meat produced by swine, sheep and goats is added, the total production of all meat is not more than 950,000 tons, or about 21 kilos per capita yearly. From this it will be understood that Brazil has not actually a meat surplus. Nevertheless during the first world war Brazil started to export refrigerated and canned meat.

In 1940 a top-quantity of almost 150 thousand tons was exported. After the war exports were less than 40,000 tons. The government intervened from time to time when exports grew too high and there were shortages in the bigger cities. Meat shortage has existed practically from 1940 onwards. It can probably be explained by pointing to the increase in consumption in the big centres and the primitive manner of supply, since means of transportation were not adjusted when consumption increased. It is no exception for cattle to walk a few hundred

miles before they reach a railway station. The loss of weight of course is tremendous. The transport by train is primitive and often takes a long time, in the course of which the cattle are neither fed nor tended. During the season, which is from about April to June, the railway equipment is insufficient to transport all the live cattle. Consequently the shortage in the cities would seem to be more a problem of transport than a problem of production.

The most important cattle-raising States are mentioned in the table below (no separation between beef and dairy cattle is made).

Number of animals in 1948

States	Cattle	Horses	Asses	Mules	Hogs	Sheep	Goats
Minas Gerais	10,178,770	1,096,940	36,610	577,370	4,032,200	230,960	252,990
Rio G. do Sul	9,034,830	1,288,440	10,180	161,010	3,355,790	10,068,340	100,030
São Paulo	6,208,100	798,520	35,510	730,230	3,218,930	167,460	359,180
Bahia	3,776,920	537,630	368,210	411,320	1,657,790	1,429,140	1,861,120
Goiás	3,765,810	477,930	19,200	59,590	1,479,210	72,460	70,010
Mato Grosso	3,220,040	260,580	3,670	15,620	529,390	110,500	45,940

Source: Anuário Estatístico, Ano X, 1949.

Cattle are also used as a source of animal power. In the interior of the country the 'carro de boi' (two-wheeled oxcar) is still very popular. The ox works slowly but is very strong. The bad conditions of most of the roads in the interior, especially during the rainy season, and the primitive construction of the vehicles (usually without greased bearings) make a strong but slow force an advantage. A 'carro de boi' is pulled by eight to sixteen oxen. When the oxen come to an age of about two years and a half they are broken to the yoke. They can work until their tenth or twelfth year, after which they are fattened to be slaughtered.

In recent years more attention has been paid to milk production, the prices of milk and milk products making this profitable, as a shortage of these lactic products is existing in most parts of the country. In spite of this, after the end of the second war, importa-

tion of powdered and condensed milk and of butter amounted to several thousand tons. Recently these imports have been heavily curtailed by new import regulations, aimed at protecting national production.

Dairy cattle are kept in the neighbourhood of the cities. The larger producing areas are the higher end of the Vale do Paraiba, near São Paulo and the 'triángulo Mineira'. Most of the milk is shipped to São Paulo in drums where it is pasteurized and bottled. Recent data on milk consumption in São Paulo city show an increase in both production and consumption. In 1940 consumption amounted to 270,000 ltr a day and increased to 330,000 ltr in 1950. Three types of milk are differentiated, A, B and C. A, being the highest grade comparable to 'baby milk' in other countries, is sold at elevated prices. B and C are the poorer qualities. The supply is still inadequate to meet the demand.

In Rio de Janeiro it is a recognized fact, that the milk sold from the 'Vaca de leite', as the Carioca[1]) calls it, a tank-car, is by no means pure milk. From time to time the newspapers publish most interesting interviews with former drivers of these tank-cars, and now and then fights or other stirring events are mentioned after housewives have found water-loving creatures in the milk. This, however, is not so strange, when one remembers the enormous difficulties the New York city authorities had not long ago in trying to eradicate similar practices.

Cheese is produced to a large extent by immigrants and their descendants. The cheese is usually very fresh when it is sold, to suit the Brazilian taste and because the quality of the milk is not good enough to enable cheese to be stored for ripening. The most popular types are 'minas' and 'prato'. In the big cities one can buy almost every type of cheese, most of them being produced in Brazil, some of very good quality.

[1]) The people born in Rio de Janeiro city are called „Cariocas" after the former Indian name, which still is used as the name of a square (Largo da Carioca).

Many dairy farms still use an old-fashioned, not to say primitive way of producing. The idea of selling the worst milk producers and keeping only the better ones is not practised. Modern feeding on a scientific basis, together with proper treatment of the animals is hampered by lack of knowledge, labour and capital. Nevertheless some very well managed enterprises do exist. The majority of the dairy cattle are only given pasturage, but the practice of feeding cottonseed cake is becoming more general than it was in former years. Deficiency in the feed is often clearly noticeable, particularly in younger animals.

It is a widely spread custom to milk only once a day and to allow the calves to suckle. Cattle with zebú blood often allow milking only when the calf is near. In such cases the calf is tied to a front leg of the cow.

It will be perfectly clear that small yields of milk must be expected. Without having statistics, estimates are dangerous, but in practice most farmers are well satisfied when they obtain about fifteen hundred liters a year from a cow.

The government import every year a number of pure bred cattle, selling them to the breeders at cost price in order to improve the Brazilian stock.

Pig breeding plays an important rôle in Brazilian rural life. Brazil possesses three quarters of all South American pigs and ranges second or third in the world as a pig-breeding country.

When cotton production was expanded before the war and the production of cottonseed oil was large enough for all home consumption, pig breeding was hard hit because Brazilian pigs are predominantly of the lard-producing type. The fat production was and still is important, but just before the war the government stimulated the introduction of the bacon type, having in mind the difficulties of selling the fat production at that time. Improved European stock was imported, mainly from England for this purpose. During the war the benefits of this change were consider-

able. Big quantities of bacon and canned meat were exported, especially for the allied forces.

In the meantime home consumption was affected in another way. Immediately after the war there was a considerable shortage of animal fats in Brazil, which caused another change in pig breeding, i.e. back to the lard type. The bacon type, however, did not dy out, as the packing plants prefer this type.

The true Brazilian breeds are all of the lard type. Well known are 'Canastrão', 'Canastra', 'Paiau', 'Tatú', 'Caruncho' and 'Nilo canastra'. Most of them have a slaughter weight of 150 kilos. Only the Tatú, a small variety, weighs about 75 kilos as an average.

Pigs are raised on a large scale in Brazilian maize-producing areas which overcomes the transport difficulties for maize, as has been already explained. In the far interior of the country, where maize cannot be grown for direct commercial purposes, pigs are the intermediates. Sometimes they are even more than that, i.e. the harvesters as well, the primitive method of driving the hogs into the corn without any further care giving good financial results regionally.

Another method is to keep the pigs in stables and to feed them the harvested ears. The diet is usually maize and nothing else. This inadequate diet is expensive and far from rational. The time required to reach a certain weight is about double the time needed with a rational diet, but the quality of lard and fat seems to be better than with more rational feeding.

Quite another, far more modern method of pig breeding is carried out in regions where milk is produced. There the feed is more balanced and a weight of 45 kg can be reached in 56 days (on maize only, in 124 days).

In 1946 and 1947 an epidemic of swine fever decimated the Brazilian stock. The government distributed millions of serum injections which are produced locally. Early in 1948 the total number of pigs had been restored to the previous level of nearly 25 million.

In the interior the horse is still very much in use, chiefly for saddle work on the farms and for travelling off the 'high-roads'.

As the climate usually is too hot for cantering, and trotting in the heat for a long time is tiring, Brazilians prefer a peculiar gait which is very comfortable indeed and with which a speed of about 7 m.p.h. can be kept up for hours.

There are a few national breeds, such as 'Mangalarga' in which English and Arab blood is represented. As most Brazilian breeders like to experiment, the breeds show little uniformity, some crossbreds having capacity and quality, however. The production of thoroughbreds is confined to the racing stables of Rio de Janeiro and São Paulo.

Except for saddle work, horses on the farms are only used for light work, the heavier being done by oxen.

Horses in Brazil might add up to some 7 million.

Next to horses there are considerable numbers of mules in Brazil, used on a large scale as pack-animals, for light traction and for drawing farm machinery. The number of mules can be estimated at about 3 millions.

Donkeys are used mainly in the Northeast. The 'vaqueiros', as the cowboys are called there, are often mounted on asses. As pack-animals asses are still widely used. The number can be estimated at a million and a half.

For climatic reasons chiefly, not more than sixteen million sheep are kept in Brazil, those of the State of Rio Grande do Sul only accounting for more than ten million.

Productivity in meat and wool is low, but as wool is used only to a small extent in Brazil, production normally covers home consumption.

Brazil has about seven and a half million goats, raised principally for their skins. The goat as a milk producer was of importance in former years, but has since declined.

In the dry Northeast goats do very well. They are kept in

flocks and live practically free. The skins are mainly exported to the U.S.A.

Poultry is widely spread over Brazil. Most of it, kept on the farms and in the city, is of a non-descript type, except for a special variety that is used for cock fighting. In the last decennia, however, many pure-bred poultry farms sprang into existence, chiefly near the city of Rio de Janeiro and in the States of São Paulo and Pernambuco.

Most packing plants are buyers of domestic fowls also. It appears that poultry farms, situated in the right regions and managed with care, are profitable nowadays.

Silkworm raising was stimulated during the war. The federal experimental station at Barbacena (Minas Gerais) is the centre for the silkworm industry.

How Brazil will stand when Japan is in the world market again in full force, cannot be foreseen, but exports of silk yarns suffered a precipitous drop in 1947.

Bee keeping on a commercial scale is carried on in several parts of the country, rabbit breeding and duck rearing exist also, but are of little importance.

Forestry

Brazil is one of the world's most densely forested countries. The Amazon region is covered with the most extensive tropical rain forest in the world.

Some authorities estimate that more than 80% of Brazil has been under forest. Nowadays, still more than 62% is forested.

Wasteful exploitation in addition to the clearing of lands for agricultural purposes destroyed large parts of the forest from North to South. Only the Amazon basin remains practically untouched notwithstanding the wild rubber gathering.

Three main forest belts can be distinguished: the Amazon basin, together with parts of the State of Maranhão; the forests

of the coastal ranges and the sub-tropical forests in the Southern States.

Timber has played an important rôle since the very start of white penetration into Brazil. The name 'Brazil' even comes from a certain kind of dyewood (Caesalpinia brasiliensis) which came from the coastal range. The Portuguese crown held the monopoly for shipping the wood. During the 16th and 17th century fortunes were made by the brazil-wood traders. The greater part of the wood went to France. Today brazil-wood can be found in the city of Rio de Janeiro where the tree is planted for ornamental purposes and for shade in the street.

The Amazon region is not only very rich in forest, but the richness in varieties of trees is also astonishing. In the State of Pará alone, more than 1,500 species are found. This number of varieties and the inaccessibility of the region, coupled with the difficulties of the climate, diseases, and shortness in manpower, meant that the Amazon region yielded wood to a very considerable quantity, but compared with the vast reserves available it was a negligible percentage. The yield per acre of marketable species is low and, contrary to the popular belief, a large part of the timber in these humid tropical forests is soft wood of little or no commercial value. It is said, however, that in some parts hard wood prevails.

Only a very limited number of types are exported to the U.S.A., i.e. chiefly Mahagony, Andiroba and Cedar. Great Britain takes a larger variety such as Jacarandá, Araraquanga, Mandioqueira, Quaruba and others. Portugal imports some of the more expensive kinds such as Maracauba and Pau Amarelo, the first being a favourite furniture wood in the North of that country.

As more urgent problems demand attention, it is unlikely that a more intensive exploitation of the Amazonian forests will take place in the near future. The rubber boom has been already mentioned as also the Ford experiment. The outcome of the Ford plantations – Fordlândia and Belterra – was not such, that

large plantations are expected to be established in the near future. Therefore the government have consequently taken up another line, i.e. the establishment of small colonist enterprises, cultivating Hevea, other tree crops and also grass. In the meantime rubber production in the Amazon basin only covers about 50% of the national demand. The price of rubber is supported by the government.

The forests of the coastal range are partly of the semi-deciduous type and partly tropical. From Natal southward to Bahia (Salvador), semi-deciduous forests prevail. From Bahia southward to Paranaguá, the tropical forest predominates with an exception in the surroundings of Rio de Janeiro. In this area the semi-deciduous forests, which lie more inland north of Rio de Janeiro, reach practically to the coast. From Rio de Janeiro westward the semi-deciduous forests with some breaks range to the Paraná river, which forms the natural frontier. Southward these forests cover northern Paraná, where the frontier with the pine forests lies.

The coastal timber has been somewhat naturally exploited first. The extremely wasteful way in which this was done caused the destruction of large parts of the forest in the northeastern States. The most important vestages still remaining are to be found in the Vale do Rio Doce, in the States of Minas Gerais and Espírito Santo. In this region the lumber industry only started after the railway was constructed in the afore mentioned valley.

The typical timbers of the coastal range are Ipê peroba (Peroba de Campos, Paratecoma peroba), Ipê tabaco (Tecoma longiflora), Jacarandá Caviuna (Brazilian rosewood, palisander – Dalbergria nigra) and Sucupira Parda (Bowdichia virgiloides). In the central parts of this zone Canela parda (Nectandia sp.), Cedar (Cediela fissilis), Imbúia (Canela Imbúia) and Peroba Rosa (Aspidosperma polyncuron) predominate as timbers of value.

The Southern Pine Belt is the only region in Brazil where one variety predominates. The Paraná pine (Araucaria Augustifolia,

A. brasiliensis) occupies large areas in the States of Paraná, Santa Catarina, Northern Rio Grande do Sul and Southern São Paulo. In the same region Imbúia, Peroba Rosa and Canela are also found, but in far inferior numbers.

The Southern Pine Belt and parts of the central semi-deciduous forests have been depleted to a great extent. To accomodate the shifting agriculture the forests were cut down, burnt or used, the most important fuel in the country, still being fire-wood. Just before the First World War started, the development of the pine lumber industry began. The war stimulated the industry and by 1918 Brazil exported pine wood to the La Plata countries. The Second World War accelerated wood cutting, as, other fuels than wood being scarce owing to import difficulties, domestic consumption increased. Exports rose to over 640,000 tons in 1947, of which more than 500,000 tons were Pine, followed by Peroba with about 20,500 tons. In recent years, however, exports encounter difficulties because Brazilian timber cannot compete with the prices of timber of the leading wood-exporting countries. The Argentine and Uruguay are still the principal buyers but Europe and the U.S.A. have bought considerably in recent years.

It is estimated that for fuel, for supply to the railways and telegraph posts the equivalent production of about 35,000 hectares of forest is used annually.

Reafforestation has been started by the railway companies, when it became more difficult to obtain wood from neighbouring forests. The trees chosen for reafforestation were principally Eucalyptus varieties. Experts doubt if it was a wise choice, but economical results are sufficiently profitable so that nowadays about six and a half million trees yearly are planted by railway companies, large wood-consuming industries and farmers. Reafforestation is largely supported by the 'Instituto Nacional do Pinho' (the National Pine Institute) and by the 'Serviço do Reflorestamento' of the Federal Government.

In Rio Grande do Sul good results were obtained by planting

Black Wattle trees, imported from South Africa. The tree grows well on eroded soils and, being a leguminous plant it improves their nitrogen contents. Furthermore thanks to the shade it provides, it protects the soil against a rapid exhaustion. From the bark of this tree tanine is extracted, while the wood is used as firewood. It is estimated that about 50 million trees have been planted in this region.

Reafforestation, however, should be carried out on a far larger scale, to compensate the cutting. A law provides for reafforestation of old lands and prevents wasteful exploitation, but as control is very difficult, the results of the law might be less than was expected.

A recent article in the 'Journal do Comércio' on this subject clearly emphasizes the situation:

The problem of reafforestation seems to be entering into a new and more serious phase which threatens to end in disastrous consequences. The present consumption of firewood probably exceeds 100 million cubic meters per annum, all of it cut from the native forests without any effort of replacement worth mentioning. Firewood is not only used for domestic cooking, but it supplies about 80% of the country's requirements as a fuel for industries.

The chief culprits for the present state of affairs are the blast furnaces using charcoal, especially those in the State of Minas Gerais, which have created absolute deserts in the neighbourhood of their works. Some of them, having consumed all the wood in their vicinity, have to obtain supplies in the Valley of the Rio Doce. Seeing that there is no control over the selling prices for their finished products, they can afford to pay the heavy cost of the long distance transport of the fuel. If immediate steps are not taken to prevent it, one of the greatest forest reserves in Brazil, that of the Rio Doce, will be turned into a desert in a few years time, as the blast furnaces will go on cutting firewood further and further afield, being concerned only in keeping

up their output and, consequently, their high rates of profit.

By contrast one should look at Sweden, which has an iron industry far larger than that of Brazil, also based on charcoal, and therefore consuming much larger quantities of timber. Far from its forest reserves being reduced, they have actually increased, for the simple reason that Swedish iron and steel manufacturers comply with the law which obliges them to plant two trees for every one cut down. They do this without question, as they realize that they are thereby ensuring fuel for their industry for centuries to come.

Nothing of the sort has been done in Brazil, and there are no signs that anything will be done in the near future, even though we are on the threshold of a new crisis in the supply of imported fuel, which will bring about a run on domestic supplies. Whenever this happens the chief demand falls on firewood, which will mean a recrudescence of the devastation of forests in all parts of the country. To what lengths this has already gone is shown by the fact that even in the Federal District charcoal burners continue to cut down woods which protect some of the springs feeding the water supply of a great part of the city and its suburbs. If this is the case near the seat of Government, one can imagine what happens in outlying places where there is no substitute for firewood.

The responsible Authorities should immediately take energetic steps to prevent this continuous devastation of the forests from rapidly turning the whole country into a desert from North to South, and from East to West. It is one of the most important and urgent problems facing the country, and which incidentally is provided for by legislation. Unfortunately, however, the laws have so far not been implemented, due to the negligence or lack of supervision of those most directly responsible.

Part II

A WAY AHEAD FOR RURAL BRAZIL

CHAPTER I

BACKGROUND OF THE CHANGE

In the history of the world it is remarkable to observe how changes in the rural production system seem to take place when the density of population approaches the limit which for convenience' sake could be called the 'food limit'. By food limit is meant the maximum quantity of food which can be produced under an existing system.

It seems that somewhere before 5,000 B. C. Agriculture was first started in the Near East. Possibly by that time the density of the population in those parts of the world had already grown too high to support the people when using more primitive ways of securing food. Julian Huxley's viewpoint in his essay 'Climate and Human History' is, that the first step from food gathering to agriculture was forced by nature. He thinks 'the pressure of the changing climate' on early man a possible reason for the important step.

In historical times changes in agricultural systems have taken place without the pressure of important changes in climate. It is remarkable that only some fifty years after Malthus had worked out his theories on population, the work of Julius von Liebig gave birth to 'modern' agricultural methods.

Excluding other influences it may be supposed that either the growing of the population, or a move of the food limit in an unfavourable direction might lead to a disturbance of the equilibrium.

When there is a threat of a disturbance of the equilibrium, the human mind has to find the means of moving the food limit, or

otherwise some uncontrollable intervention invariably takes place.

The necessity for a change in the production system is there, when under the existing system the production is not large enough to allow people 'freedom from want' at least for the prime necessities – presuming the distribution system does not show deficiencies so great that curing them would guarantee the same.

Why it is supposed that Brazil really is on the road to such a necessity, will be explained on the following pages.

As has been said in Part I, one of the most important basic characteristics of rural production in Brazil is its destructive and highly speculative basis.

The primitive system which led to soil exhaustion in extremely large areas of the country – via shifting agriculture – can only be maintained when high-productive virgin soils are available within the economic limit which exists for the production of each product as far as 'distance to the market' is concerned. Such regions are only to be found today 500 km or more in a straight line from the important consumption centres. This makes it impossible in those regions to grow crops which have a relative low price per unit of weight for the afore mentioned markets on an economically justified basis. The costs for transportation from the highly productive regions to the big consumption centres have grown too high, not only because freight rates have increased, but more particularly because the production centres have moved further away. Today 70 cruzeiros are paid for the transport of a bag of coffee from Northern Paraná to the port of Santos, by truck. For coffee this high freight rate is no impedement as the price per bag is more than Cr.$ 1,000.— but for maize it is prohibitive, the quotations for a bag of maize being about 80 cruzeiros in São Paulo's grain exchange. The production of other crops with a low value per unit of weight in the far away regions in order to provide the big markets is also impossible.

A solution might be found without changing the agricultural methods. The artificial lowering of transport costs, or stimulated

processing of farm products in the regions where the soil still gives high yields, are alternatives. The first mentioned solution would only mean postponement of the definite change. The second solution is limited as has been pointed out already in Chapter IV of Part I. Besides this, as long as coffee prices remain high, there would be very little sense in producing anything but coffee on the highly productive lands – even if transportation costs were lowered – as this crop gives a net profit which is many times greater than that of other crops. Exact figures to back up this statement cannot be given, but the farmers without exception agree with it, and their speculative nature stiffens them in this attitude.

Should the primitive production system be maintained after the virgin land within economic distance to the market has disappeared, the result would be a further lowering of the yield per area. This lowering could be compensated by extending the area under cultivation, but if the yield per area becomes less than a certain limit, production is no longer economically justified. Although this limit varies widely, dependent as it is on a number of factors, the average yields in Brazil for the relatively low-priced rural products may be judged to be near to that limit, when compared with the average yields in other South American countries. The next table gives some figures.

Average yield in 100 kilos/hectare 1946/'7/'8

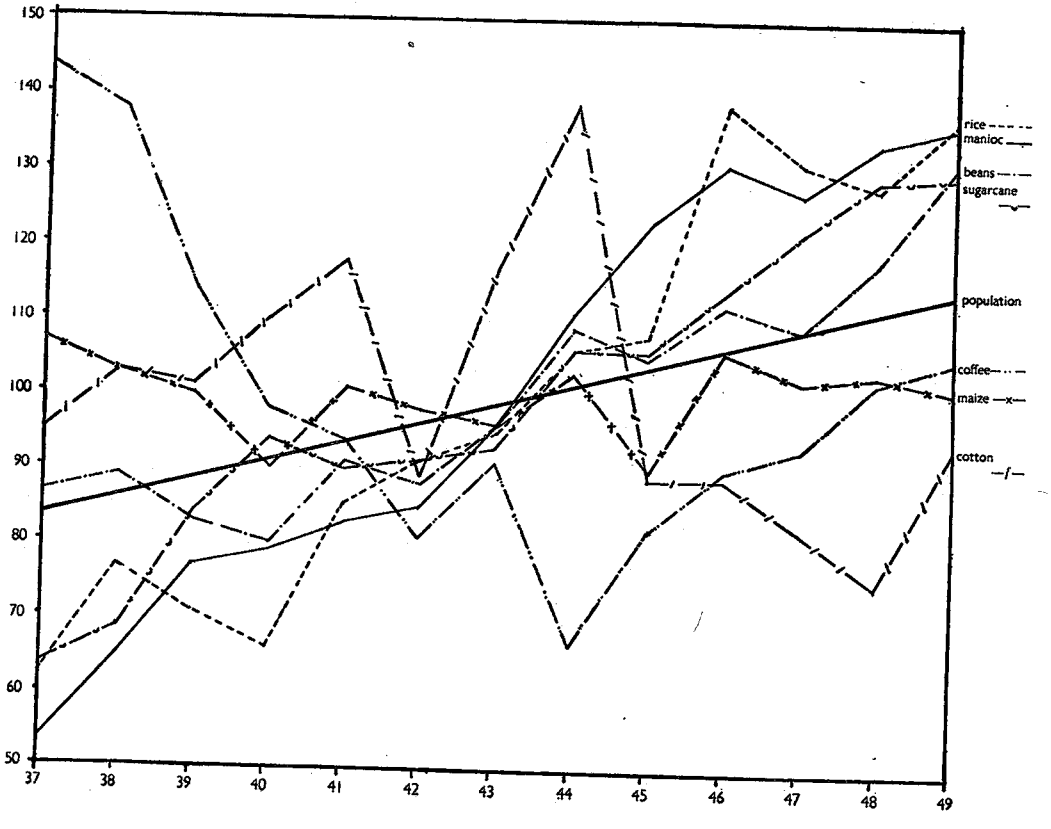
Product	Brazil	Argentine	Columbia	Perú	Average S. America
Maize . . .	12.8	23.3	10.3	18.5	15.5
Beans . . .	15.0	26.6	20.1	34.9	16.8
Rice	6.8	9.8	4.9	8.0	7.0
Potatoes . .	47.0	52.0	44.0	45.0	53.0

Source: F.A.O. Yearbook of Food and Agricultural Statistics.

Still one other possibility should be mentioned. When it becomes uneconomical to produce certain products, theoretically one has

Diagram XII

COURSE OF PRODUCTION



still the alternative of producing them in the country itself under new methods, or to import them from abroad. The alternative adopted would depend largely on circumstances outside agriculture.

For Brazil, at the present day there is hardly any choice. Rural production plays a big rôle in Brazil's economy and industry, although it is developing quickly, will probably not be able to take over this rôle in the near future. This is one reason why rural production should not decrease, but be extended to supply the increasing needs of the multiplying population and to strenghten the economic position of the country.

The main reason why increased production is of highest importance is shown in the next diagrams. Diagram XII shows the course of production from 1937 to 1949 of the 8 most important Brazilian crops, together with animal production. The volume of the average production of each product in the period 1937/'49 is taken as 100, so that the lines show the relative increase or decrease in the volume of production. The compilation of Diagram XII is based on data taken from publications of the 'Instituto Brasileiro de Geografia e Estatística' until 1946; the data after that year are taken from the 'Relatório do Banco do Brasil 1949'. To draw the line of population the figure of the census of 1940 is taken as the population for 1939 and called 100, the figure for 1949 is that of the census in 1950.

Although diagram XII gives at a glance an impression of the course of production of the most important crops, it does not allow comparison of the total production of the items mentioned with the rise of population. Several attempts have been made to do this, the more recent one being a study of Luiz L. de Vasconcelos, 'Quadros da Produção Agrícola Brasileira 1940–1950' (Tables concerning Rural Production in Brazil) published in the 'Revista Brasileira de Economia' of December 1950. Mr. Vasconcelos made a calculation of the value of the production based on the prices the producer obtained during the above mentioned

period, and making a correction to allow for the inflation which took place during that period. The method, the author says himself, is debatable. For an analysis, which does not pretend to be exact, it will suffice.

Another method to compare the course of production with the course of the population, which has not the pretention of exactness either, will follow hereafter.

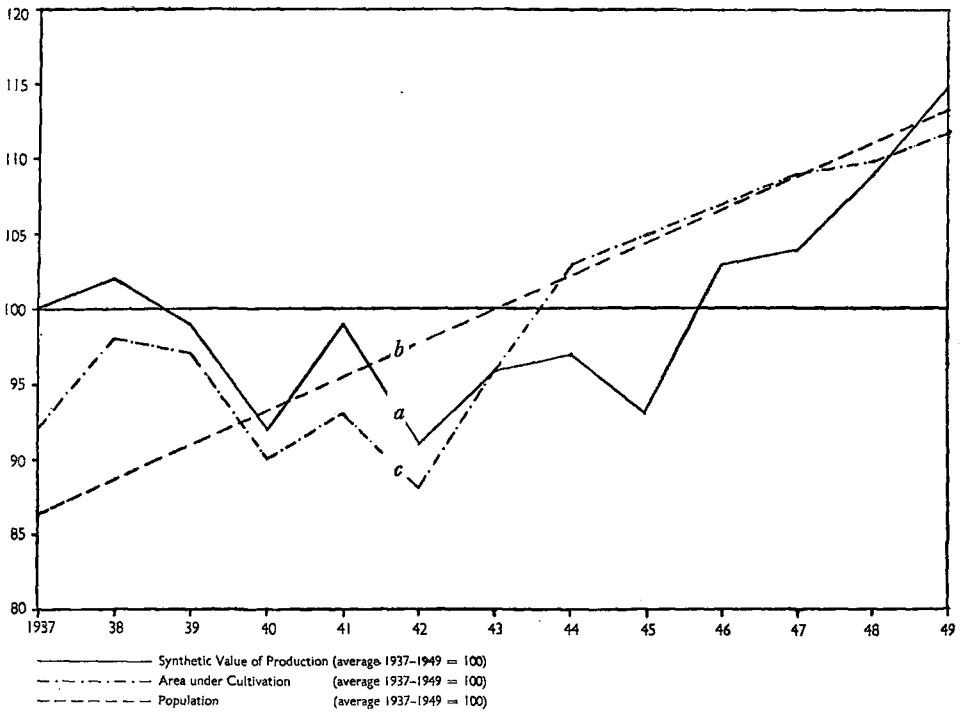
The yearly production of the 9 most important agricultural crops, together with the animal production (representing 88% of the total rural production in 1949) is multiplied by an index. This index is found from the average value per unit per product during a thirteen-years period (1937–1949). The lowest average price (sugar cane) was given the index 1 and the others obtained as an index a multiple corresponding with the average prices when compared with that of sugar cane.

In this way synthetic values for the yearly production of the products are found and these can be added up year by year, because they are of the same order. The synthetic yearly values of the total yearly production of the ten items are compared with the average synthetic yearly production in the thirteen-years period.

Table I gives the average producers' price per ton and the indices per product when the average price for sugar cane is called 1. The figures are taken from 'Anuários Estatísticos' until 1944 and from 1945 on from the 'Serviço de Estatística da produção do Ministério da Agricultura'. In table II the synthetic value of the yearly production is given per product and added together, thus showing total synthetic values of the yearly production of the ten items. The average of the last mentioned figures, being 363,817, is taken as index 100, and the synthetic values of the yearly production of the ten afore mentioned items are expressed as a percentage of this average. In this way, figures in the last line of the table are arrived at.

In diagram XIII the figures of the last line of table II are used to draw line *a* which indicates the course of production.

Diagram XIII



In the same diagram the rise in population is indicated by line *b*. This line is found by calling the average population in the thirteen-years period 100 and by expressing the officially estimated population in 1937 and 1949 as percentages of the average population during that period.

Finally line *c*, indicating the course of the planted area in the afore mentioned period, was drawn on the same principles as line *a*, calling the average area 100.

The choice of the period is based on:

1. Limited availability of statistic material.
2. The fact that it seems desirable to take into consideration four years before the war, the war period itself and four years after the war (1940 is not considered as belonging to the war period).

TABLE I

Average yearly price per ton in cruzeiros

	Rice	Cotton	Manioc	Coffee	Corn	Sugar cane	Beans	Wheat	Potatoes	Animal Prod.
1937	590	3,400	101	1,355	233	25	437	480	400	1,900[1])
1938	544	3,442	87	1,443	238	28	453	538	410	2,000[1])
1939	530	3,316	77	1,433	228	29	513	547	400	2,100[1])
1940	519	3,147	70	1,367	243	29	580	684	472	2,107
1941	567	2,956	77	1,417	248	32	610	706	459	2,324
1942	614	3,805	89	1,600	280	34	602	742	485	2,763
1943	789	4,864	99	1,883	410	39	725	744	549	3,457
1944	1,005	5,313	127	3,483	565	56	1,055	892	903	4,348
1945	1,137	5,390	148	4,450	697	67	1,175	1,036	1,061	4,952
1946	1,124	6,764	157	5,817	704	72	1,230	1,780	1,332	5,765
1947	1,285	9,387	174	5,849	798	75	1,692	2,590	1,767	6,883
1948	1,617	10,902	189	6,218	936	78	2,401	2,525	1,825	6,769
1949	1,888	11,106	190	7,133	1,091	85	2,205	2,440	1,472	7,000[1])
Average price per ton 1937/1949	939	5,676	122	3,342	513	50	1,052	1,208	887	4,028
Index Sugar cane = 1	19	114	2	67	10	1	21	24	18	81

[1]) Private estimate.

TABLE II

Synthetic values

(yearly production in 1,000 tons multiplied with the indexes of table I)

Product	1937	1938	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949
Rice (19)	23,408	29,051	28,205	25,080	32,072	35,739	35,986	40,090	40,793	52,421	49,324	48,526	51,680
Cotton (114)	46,170	49,772	48,849	53,432	57,342	42,878	56,567	67,534	43,149	42,969	39,524	36,434	45,144
Manioc (2)	10,026	12,041	14,224	14,664	15,526	15,832	17,872	20,668	22,830	24,450	23,690	24,910	25,232
Coffee (67)	97.887	94,076	77,519	67,134	64,454	55,610	61,772	46,029	55,945	61,459	63,482	69,513	71,676
Maize (10)	57,759	55,598	53,940	48,760	54,380	52,760	52,100	55,750	48,470	57,210	55,030	56,070	54,490
Sugar cane (1)	15,290	16,582	19,988	22,252	21,463	21,574	22,050	25,149	25,179	28,068	28,990	30,892	30,929
Beans (21)	17,403	17,934	16,590	16,107	18,375	17,598	19,299	21,903	21,042	22,596	21,966	23,793	26,397
Wheat (24)	3,574	3,395	2,424	2,448	5,544	5,208	5,352	4,104	5,592	5,112	8,618	9,720	10,512
Potatoes (18)	5,810	7,220	9,072	7,812	8,154	7,506	9,324	8,334	10,728	9,756	10,350	10,530	13,464
Animal products (81) . . .	85,860	85,050	87,804	78,651	82,296	76,869	68,607	63,828	63,990	72,330	76,626	85,455	90,200
Total synthetic values . . .	363,187	370,719	358,615	336,340	359,606	331,574	348,929	353,389	337,718	376,371	377,600	395,843	419,724
							Average: 363,817						
Index, when average total syntetic values in the period 1937/'49 = 100	100	102	99	92	99	91	96	97	93	103	104	109	115

From diagram XIII the following most apparent conclusions may be drawn:

1. The course of production between 1937 and 1946 is unfavourable when compared with the course of population.
2. After 1945 the course of production shows a remarkable increase, which is more pronounced than the increase in population.
3. Comparing the situation in 1937 and 1949 it is seen that the production per capita in 1949 is still considerably lower than in 1937.
4. From 1937 until 1942 there is a remarkable correlation between the cultivated area and production. After that year the situation seems to have changed and the disturbing influences of World War II may be a reason for the different situation in the next two years. From 1945 on the production per hectare is seen to be increasing (the lines a. and c. are definitely converging from that year on).

Summarizing it can be said that production per capita has decreased in the last thirteen years, but that there exists a more favourable trend. In the years after the war an intensification of rural production started. This intensification continues to improve the purchasing capacity of the whole population.

In Chapter III of Part I the low purchasing capacity of the Brazilian people has already been mentioned in addition to its possible effects on Brazilian industrialization. An improved purchasing capacity can be reached only if the production per capita can be further increased. Therefore, the first step to a harmonious development of agricultural and industrial production in Brazil has to be an improved production and distribution of agricultural products. Most of the inhabitants earn their living in Agriculture and already twice in this century self-sufficiency with basic material has shown its importance. As a consequence of this development improved social conditions in the rural sector will result.

The foregoing makes it clear that an increased rural production is

of paramount national importance and therefore it is not surprising that the government are paying full attention to this problem.

As a consequence of the Brazilian mentality, of which individualism is a noticeable characteristic, the Brazilian Governments in the past generally intervened as little as possible in economic activities within the country. As a rule, the duties of the Federal and State Governments have been limited mainly to national defense and the security of the life and possessions of the inhabitants. In more recent years, especially, much attention has been paid to public works and education, whereas intervention in importation and exportation of goods and capital reached a peak after the war.

It is sometimes said that the year of 1907 brought a radical change in Brazilian agriculture. Before that year, during which a big coffee crisis took place, agriculture was completely left to itself. The crisis so affected the economic life, in the first instance in the State of São Paulo, that the government of that State felt obliged to take steps. The first step was the foundation of the 'Secretaria de Agricultura do Estado de São Paulo' (the Secretariat of Agriculture of the State of São Paulo). Two years later the Federal Government followed the example of São Paulo by founding a Ministry of Agriculture. Later in other States, Secretariats of Agriculture were instituted also. These are sometimes part of the Secretariat of Industry or Public Works etc. From 1907 on the governments paid more and more attention to agriculture. Experts were invited from abroad. Schools and research institutes, experimental stations and governmental farms were founded. Laws were enacted to protect agriculture against importation of plant diseases. The farmer was safe-guarded against importation of ineffective implements and credit facilities were extended.

All these measures have a permanent character. The more direct types of intervention which took place were less permanent however. This was mainly due to lack of stability of the governments, together with the tendency to change policies when government changed. Lack of a firmly established farm popu-

lation as a result of shifting agriculture, and the varying circumstances in the different parts of the country led in the same direction. Some examples of the lack of stability in production policy have been given in Part I (coffee, wheat). From this it is apparent that, notwithstanding the fact that much has been done by the government to improve the situation in agricultural and other sectors, a movement to co-ordinate forces for improving the economy of the country is new in Brazil. Such a nation-wide production policy, under the direction of the Federal Government was the aim of the SALTE Plan.

The Salte plan

In part I it was said, that Brazilians often tend to make 'small solutions' ('geitinhos') to overcome difficulties, in preference to taking measures which might have more lasting and broader results.

The opposite can be said of the Salte plan which not only endeavours to cure the symptoms of the defects in the Brazilian economy, but aims at the roots of the problem. For this alone, study of the plan is worth while and even if realization should not be effected, the plan definitely has the value of pointing to the real deficiencies in Brazilian economic life.

Although this study deals only with rural problems, to obtain a general impression it might be useful to mention the four parts of this plan.

The first part, 'Saude' (health) is based on the supposition, that it is impossible to attain efficient production, good qualities, adequate quantities and as a result social progress, with labour: "physically and mentally debilitated and weakened in their vigour." The plan continues to stress: "Therefore, a system of medical assistance is not only a social duty, but a precept of an economical nature of high importance." Extensive statistical data and profound studies comparing death rates in Brazil with several other countries are given in the plan to make clear, that improvement of health is important enough to justify considerable amplification of existing measures.

The second part under the title 'Alimentação' (Food) deals with items of basic value to agricultural production, and measures to be taken to improve the production of each individual crop. The next chapters of this study, although differing in some respects from measures mentioned in the Salte plan, will deal with the general lines of these problems in particular.

The third part 'Transporte' (Transport) indicates what improvements should be effected in transport facilities. Railway, marine, river and road transport, all show deficiencies, although road building has increased substantially in recent years. The plan suggests the railway problem to be handled by construction of railways in accordance with the National Transport Plan, improvement of existing lines, and purchases of new rolling stock and traction, and additional workshop equipment. The merchant fleet is to be renovated and river navigability to be improved. Re-equipment of ports is another item. A highway construction program and a pipe line from Santos to São Paulo, which is under construction, are other important items.

The final part of the plan, called 'Energia' (Energy) is divided into a section dealing with electric power, and one, dealing with petroleum. The existing potential water power in Brazil is exploited on a relatively small scale. Amplification of hydro-electric projects for industrial purposes and for rural electrification is the principle aim dealt with in this chapter of the plan.

The increase of production is the principal aim of the Salte plan. Although it has been said earlier on, that a change in the government generally meant a complete change of policy in the past, it might prove to be otherwise in this case, as the re-elected president, Getúlio Vargas has already declared that his principal aim will be to stimulate both agricultural and industrial production. Therefore it is to be expected, that the new government will realize this aim. The means, however, may differ from those mentioned in the Salte plan, as the plan might be considered to be too ambitious. The newly created commission on agricultural

policy is due to study and to formulate a nation-wide rural production policy.

As has been explained in this chapter, economic reasons are the principle causes which lead to a possible change. The reserves of virgin land have been used to such an extent, that nowadays highly productive soils are only to be found in remote parts of the country. In those far regions it is impossible to produce most of the prime necessities for the large consumption centres. The population is increasing rapidly. Soils nearer to the more densily populated areas generally have a poor quality, whilst land prices are prohibitive for the founding of intensified rural enterprises.

Other reasons, especially social ones, also make a new development desirable. Today's situation makes it very difficult to improve social conditions in the interior, as a scattered population cannot be educated, trained, or medically treated adequately. Together with the economical factors, this is a reason why a large number of the Brazilian rural inhabitants are not of such value to the country as they might be under more favourable conditions. In Europe the rural population as an entity is a steady part of the population, a reservoir from which the cities obtain fresh blood, a healthy, hard working group of able people on which the country can rely. This is far less the case in Brazil. This should not be considered the fault of the Brazilian country people themselves or of the government, but rather a consequence of the rural configuration which has grown during centuries to its present form. The government are aware of the lack of a substantial farmer class and this is a reason why immigration of farmers is welcome. How well immigration will suit the probable new configuration will be explained in Chapter IV of this part. First, however, the more important general improvements, partly planned already by the government, together with recommended improvements in some important crops, will be dealt with in the next two chapters. These general improvements are thought to be the lines along which a change should be stimulated.

CHAPTER II

THE MORE URGENT GENERAL IMPROVEMENTS IN RURAL PRODUCTION

It has already been mentioned that in Brazil rural enterprises are usually short of capital. The owners of big farms may be very rich themselves, but this does not exclude capital shortage in the enterprises. Lack of implements, insufficient storage facilities and a very low degree of intensitivety are common things observable when visiting most farms. It has been explained before in this study that for the individual farmer this low intensitivety often brings the highest rewards; for the country as a whole however, it is very doubtful whether the best results have been obtained with the present systems for production and distribution.

Capital shortage, transport difficulties, lack of credit facilities, a high rate of interest on capital, each may be considered either a cause or a result. Strongly reacting one on another, they give rise to secundary symptoms such as lack of rural education, lack of care of the soil, crops and cattle, lack of storage facilities and, furthermore, to a strong position of the intermediaries. The result of these symptons inevitably leads to low prices for the products at the farm and to high consumer prices, together with a very low standard of living and bad hygienic conditions in the interior.

As all afore mentioned facts and symptoms are as closely interconnected as the parts of the living organism, only an over-all effort to improve the system as a whole, can bring lasting results. In the meantime it should not be overlooked that partial

improvements can be valuable, but, unless they are parts of a carefully prepared plan, the results may lay far behind expectation.

Credit facilities

"Without a definite arrangement for facilitating rural credits no improvements in agriculture can be achieved."

This statement was made by Dr Julio Cezar Covello, a well known Brazilian rural economist, in one of his lectures. He could have said the same of other factors, such as rural education and transport facilities, not to mention others. Although the question 'where to start' can be thought rather important, and can give rise to more or less scientific disputes, of greater importance is a simultaneous and co-ordinated attack on as many basical problems as possible.

As it is only possible to describe the problems one after another, the choice of Dr Covello will be followed without any objection.

Credit facilities are few in Brazil, credit difficulties, as a consequence, abundant. The national bank, the Banco do Brasil, has a special rural credit department but the regulations of a central bank are not very suitable for rural credits which have a very special character. Normally warrants and guarantees are not extended in the way to which general bankers are accustomed. The clients have only little or no knowledge of general finance customs and terms. Clients of this type need far more personal attention and personal guarantees play a more important rôle in rural credit than in trade or industrial financing.

It is generally thought that, working through the rural credit department of the Banco do Brasil, the small farmer has not enough opportunity to obtain the credits he so desperately needs. Big 'capitalist' farmers and merchants, however, who can give normal guarantees, receive all the benefits of the system. Under this practice the position of the merchant is further strengthened and that of the small farmers is weakened.

The Banco do Brasil publishes every year data relating to rural credits. These are divided into credit, to big, medium and small farmers, in order to demonstrate that the small farmer obtains his share. The next table gives the figures published in 1950.

% of the total number of credits

	1938/'44	'45	'46	'47	'48	'49	'38/'49
To small farms:							
Cr.$ 250.00 to Cr.$ 5,000.00	8	4	4	5	5	5	6
Cr.$ 5,001.00 to Cr.$ 10,000.00	13	9	10	11	11	11	11
Cr.$ 10,001.00 to Cr.$ 20,000.00	17	13	16	15	16	18	16
Cr.$ 20,001.00 to Cr.$ 30,000.00	12	11	11	8	8	5	11
	50	37	41	39	40	39	44
To medium size farms:							
Cr.$ 30,001.00 to Cr.$ 50,000.00	14	14	15	11	11	11	13
Cr.$ 50,001.00 to Cr.$ 100,000.00	16	18	18	16	16	18	17
	30	32	33	27	27	29	30
To big farms:							
Cr.$ 100,001.00 to Cr.$ 500,000.00	17	25	23	28	26	26	22
To very big enterprises:							
Cr.$ 500,000.00 and more	3	6	3	6	7	6	4
Total number of credits in %	100	100	100	100	100	100	100
Total number of credits	77503	29614	17478	5847	9513	15286	155241

A study of the table on page 53 shows that the percentages of small farmers (farmers with less than 50 ha), middle class farmers (50 to 1000 ha) and big enterprises, are 70%, 28% and 2%. The above table shows that the number of credits awarded to these groups is disproportionately 44%, 30% and 26%.

In highly developed countries special institutions have come into existence to meet the need for rural credits. In Brazil the necessity for special arrangements has been appreciated and the establishment of a new bank, the 'Banco Rural', is proposed.

The principles under which the Banco Rural will operate can be summarized as follows:

- the basis of operations will be the financing of the producer himself;
- decentralization, making it easier for the farmer to reach the branch office of the bank;
- limitation of administrative formalities for the farmer who seeks a credit;
- possibilities of awarding personal credits with a personal guarantee;
- a lower rate of interest than is charged on the normal capital market, together with exemption from taxes on the operations;
- preference for financing discounts or loans for the purchase of fertilizers, seeds, implements, animal reproduction material, means of transportation, etc.;
- support for the producer enabling him to give warrants and collaterals;
- credits for the establishment of new enterprises;
- preference for those farmers who wish to modernize their enterprises by using machinery and modern implements and for those who take measures to protect their soils against erosion.

Rural insurance is another point to be studied by the Banco Rural. On the one hand rural insurance may be thought more necessary in Brazil than in countries with a temperate climate. Diseases in crops and cattle can have disastrous results in the country, which can easily ruin a farmer. For this reason, rural insurance seems indispensable. On the other hand, the statistics necessary to calculate risks and premiums, are neither very reliable nor complete, and therefore a rural insurance might be rather a hazardous undertaking.

A solution has not yet been found and it is doubtful whether it will be possible to arrive at one in the near future.

Another way to improve credit facilities, which already exists, is to channel credits via the co-operative organizations. The

'Caixa de Crédito Cooperativo' [1]) is an institution founded in 1945 which comes under the Ministry of Agriculture. Its objective is to finance, assist and to stimulate co-operation. Both co-operative organizations in the making and existing ones can obtain credits for the following purposes:

- the purchase of capital goods and necessities;
- the carrying out of works;
- the founding of industries;
- the setting up of an organization for limiting the profits of intermediaries;
- other aims to be judged by the administration of the 'caixa', with the consent of the Minister of Agriculture.

Taking into consideration that the field of activity of this institution is the whole country, the initial capital of Cr.$ 300,000,000.00 which has not yet been furnished completely is small and consequently, its operations are limited. [2])

Co-operation is stimulated by the government and although the statistical data are not complete, it may be judged that co-operation is gaining ground. In a recent publication Valdiki Moura, Secretary General of the C.N.E.C. (National Centre for Studies in Co-operation) gave the figures of the next table, however, with the indication 'incomplete'.

Financial means of the co-operative organisations

	In 1,000 cruzeiros				Indices		
	1939	1940	1941	1942	1940	1941	1942
Capital	46,928	83,385	90,089	117,162	178	192	250
Real estate . .	51,134	98,361	94,421	122,844	192	166	240
Deposits . . .	116,704	141,191	352,002	274,094	121	302	235
Loans	120,787	177,285	272,429	251,029	147	225	208
Sales	132,025	139,105	329,221	385,686	105	249	292
Reserve funds .	25,310	22,446	27,709	29,262	89	109	116
Various funds .	15,983	37,245	30,362	35,911	232	190	225

[1]) In August 1951 the name was changed into 'Banco Nacional de Crédito Cooperativo'.
[2]) In August 1951 the Ministry of Agriculture furnisted a new loan of 200 million cruzeiros.

Further figures for the number of co-operations are not of a recent date either and are incomplete as well.

The number shown in the next table are compilated from official data:

consumer co-operations (included educational co-operations)	1,266
producers co-operations (not only agricultural)	1,043
credit co-operations	315
various other co-operations	58
top-co-operations	34
	2,716

The total number of members was about 400,000. Less than half of these 400,000 may be members to Agricultural co-operations. When, for convenience, half of the number is taken as an estimate, this means that only about 10% of the agricultural producers are members to agricultural co-operations, as the total number of agricultural enterprises may be estimated at about 2,000,000.

Transportation has been chosen as the next point, not because this is supposed to be of more importance than those following, but merely because in this way the interrelations between the several items of this chapter may be shown clearly.

Transportation problems

A look at a map of Brazil makes it clear that topographical factors do not facilitate the construction of railroads and highways. This is accentuated by the fact that the rivers do not flow in a direction which would be the most convenient for transportation of the products from the main production centres to the coastal regions.

The sharp escarpment running along the more important part of the coast has been mentioned already. This is one of the big obstacles that have to be overcome in the construction of roads. Along the whole extent of the escarpment only three modern all-weather highways give access to the interior of the country. These are the new road between Rio de Janeiro and São Paulo, the Via Anchieta between Santos and São Paulo, a masterpiece of modern highway building, and the road from Rio de Janeiro to Petrópolis. This latter was constructed earlier and is considered by road-building experts to be a prodigious fact of engineering. Apart from these three roads, only second-class roads and tracks lead from the coastal plain to the plateau. The most important railroads, winding up the escarpment are the one in the Vale do Rio Doce, that between Rio de Janeiro and Belo Horizonte and that between Santos and São Paulo.

The maintenance of the roads and railroads itself is a tremendous task, since in the hilly and mountainous parts torrential rains cause much damage. The enormous distances make it too expensive to surface most of the roads with concrete or asphalt and this in turn makes conservation more costly. In spite of the efforts the government have made in recent years, the condition of the Brazilian roads in general is deficient compared with those in Europe.

The railroads were built with three different gauges which makes interconnections of the existing railway systems not an easy undertaking. Goods have to be reloaded at each change in gauge. This causes delay and increases chances of damage and theft, to say nothing of the time and labour involved. This drawback to the rail transport system is not the only one. A difficulty which is of still more importance is the shortage of rolling stock. This is partly due to lack of care of the existing equipment, providing much material for newspaper articles which include photographs of vans marked for repair with a date several months back. Nowadays most of the railways which were originally

privately owned have been taken over by the government, since conditions made it difficult for them to operate economically.

Coastwise shipping has proved to be very expensive under the existing circumstances. Foreign competition is barred and only Brazilian companies are entitled to carry out this kind of transportation. To investigate the true reasons for the failure in this field is not the scope of this essay. The main reasons mentioned by responsible opinion, are lack of organization, lack of competition and lack of care for the material.

From what has been said in the few lines above, an impression may be obtained from the technical difficulties confronting transportation in Brazil. Apart from the technical aspect, the existing administrative regulations do not facilitate transportation either. Most of these regulations aim at controlling the transportation of goods and at levying taxes on the goods. Taxation system in Brazil follows the more primitive method of levying taxes on goods rather than on income.

Taking into account the shifting agriculture which causes the main production zones to withdraw further and further from the consumption centres, it is clear, that the Brazilian rural producer cannot easily obtain fair prices for his products. The economical drawbacks of producing at great distances from the market are accentuated by technical and administrative difficulties in transportation.

The government realize the importance of improvements in the field of transportation. In the last ten years spectacular works have been undertaken. As regards railroads, Brazil has more than 40,000 km now, of which about 2,000 km have been built in the last four years. Today it is possible to travel from Uruguayana on the Argentinian border to Fortaleza, the State capital of Ceará, by train, a distance of more than 3500 km due North.

Many thousands km of roads have been built notwithstanding the low degree of intensitivety in rural enterprises.

Improvements in transport, valuable as they may be, will only produce a full benefit if they are executed in close co-ordination with improvements in other sectors of economic life.

An interrelation between transportation difficulties and lack of credit may be found, in the first instance, in the difficulty the producer has in making personal contact with the bank and vice versa. This personal contact which is of far more importance in rural credits than in any other type of finance is hardly possible under the present-day system. Another important link between transportation and credit is the questionable value the products may have as long as they are on the farm. Exact figures concerning losses due to lack of transportation coupled with lack of storage facilities cannot be given, but losses of fifty percent and more of the harvested product, due to deterioration, are no exception in some regions.

High rates of interest

Interrelation between the two last mentioned factors and the high rate of interest can be explained briefly without entering into the complicated causes of the general high rate of interest on any kind of credit in Brazil. It should be borne in mind that it is usually considered preferable to give credit to a neighbour next door than under similar conditions to a man living in a distant place. If the man is living so far away that a visit entails a tiring voyage of several days, the case is accentuated. When, in addition, the neighbour can give more security and still pays a high interest, it is quite obvious the more remote man will have to pay more heavily. It is an open question whether this is usury or not.

Private capital therefore is not a good source to provide credit for the Brazilian farmer.

To give an impression, it may be useful to mention that 12% per annum is a normal interest on commercial credits. Interests

higher than this are prohibited by the law, but nevertheless 30–45% per annum is sometimes asked for rural credits and even still higher prices are paid for the use of money.

The establishment of the Rural Bank, with many branch offices in the interior of the country, could mean a definite step foreward.

Rural education

Of the symptoms called 'secundary' on page 125, lack of rural education can be chosen as the first item. It is obviously impossible to improve results in agricultural production with a rural population, having no knowledge other then the tradition and experience of their ancestors. Both are indispensable, but they are not enough in modern times. The rural producer in Brazil has to compete with those of other countries where rural education and experimental work, based on science, have improved production, storage and handling of the products.

The first public rural education in Brazil was started in 1910 when the School of Agriculture ('Luiz de Queiros') was founded in Piracicaba (São Paulo). From that time on the number of rural training centres increased steadily. In the State of São Paulo in 1949, there were already 62 rural schools functioning of which 60 were in the 'interior' and 2 in the state capital. This means that in this most advanced State of Brazil there is one school per each 4,000 square kilometers. In São Paulo where the road system is not yet highly developed – although being the densest in Brazil – this means that a large percentage of the children are unable to attend the schools. In other Brazilian States the situation is still worse. This shows that rural education especially in the basic form could well be extended. The low density of population in most of the rural districts in Brazil, however, makes the elementary general education already a problem in large parts of the country. This results in a high percentage of illiteracy and prevents any exten-

sion of specialized education. Both Federal and State governments do their utmost, firstly, to fight illiteracy and secondly, to increase rural education.

Rural education in Brazil, regulated by the law no 9,613 of 28–8–1946, can be outlined as follows. The law divides the tuition in three kinds of schools, those for basic rural training ('escolas de iniciação agrícola'), the rural schools ('escolas agrícolas') and the rural technical schools ('escolas agrotécnicas'). These give respectively basic, advanced and specialized rural training. The basic training lasts two years, the advanced a further two years, whilst specialized training is confined to the training of rural teachers.

For the basic school the would-be pupil is required to have finished primary education and have reached an age of at least twelve years. To be admitted to the 'escola agrícola' a pupil is required to have finished the 'escola de iniciação agrícola' course, while to be admitted to the specialized courses the 'escola agrícola' has to have been completed.

K.M. 47, the magnificent federal institution near Rio de Janeiro, where the 'Escola Superior de Agronomia' and the 'Escola Superior de Veterinária' are located should be mentioned separately, as this is the only Federal institution for higher rural education in Brazil. Other similar institutions exist, but they are governed by the individual States.

Besides the specialized agricultural training, an important development should be mentioned which is becoming a valuable item for rural Brazil i.e. the development of the 'Clubes Agrícolas'. These may be seen as a Brazilian counterpart of the North American 4-H-clubs, but they are not a copy of them.

The principal aim of the 'clubes agrícolas' is the improvement of social conditions in the interior of the country by improving methods of production. To achieve this, the children in school receive demonstrations of the results obtainable with the application of more skill and understanding.

In 1933 the example was set by the school of Butantan in the State of São Paulo.

In conjunction to the normal primary education, the children can join the 'clubes agrícolas' in which the teacher instructs them in the principles of rural life, modern agricultural methods, rural economy and the crops of the region. The theory is complemented by practical work. The children grow their own crops collectively, breed small animals and make excursions to neighbouring farms. They have competitions and exhibitions and even compete at regional or national shows with their animals and products. As the production of the 'clubes agrícolas' is sold normally by the children themselves and as the expenses are carefully recorded, they obtain an idea of farm economy. It is not the intention of the 'clubes agrícolas' to specialize the education.

To become a member of a 'clube agrícola' one must be between 8 and 18 years of age and be able to read and write.

The principal objectives of the 'clubes agrícolas' can be summarized as follows:

- to infuse in the mind of the club member attachment to the soil, respect for rural work and an impression of its economic value;
- to dignify manual labour, to elevate the agricultural profession;
- to show the dangers of urbanization and abandonment of the rural zones;
- to stimulate the co-operative spirit in school, in the family and in the community;
- to stimulate poly-culture and to provide instruction in rational agricultural methods both in theory and in practice demonstrating the efficiency of these methods;
- to rouse in the member's mind, specially in those of the female members, the significance of the idea 'home';
- to collaborate for the improvement of rural life, paying attention to sociability, aesthetics, and culture in general;

- to stimulate the habit of saving and to show the members a better way to spend their money;
- to make propaganda in the rural community for comfortable, gay and hygienic houses, teaching the members to appreciate tidyness and cleanliness;
- to protect animals and plants;
- to work for reafforestation by laying out a club's forest in some suitable place, preparing the seed beds which provide the members with seedlings and encouraging the farmers to reafforest parts of their properties;
- to organize a co-operative selling organization for the sale of the club's production;
- to spread the knowledge of an adequate nutrition as the basis of good health;
- to counter fire-agriculture, erosion and pests.

The program, ambitious as it may seem, covers the needs of the community for the specialized education already mentioned before. In order to reach co-ordination the government appointed one of the services of the Ministry of Agriculture to supervise the 'clubes agrícolas'. This service, the 'Serviço de Informação Agrícola' registers the 'clubes agrícolas' and renders them assistance by means of information, supplying seeds and making implements available. The 'clubes agrícolas' in turn send a weekly report to the 'Serviço' in order to make co-ordination possible. Nevertheless the 'clubes agrícolas' retain complete autonomy.

An extension of the influence of the 'clubes agrícolas' may be reached in the future by enrolling as members not only the pupils of several schools but other youths of the region as well. Till now the 'clubes agrícolas' usually are school institutions and their influence ends when the members leave school. It is regrettable that most of the club members after finishing their education do not work on a farm and the small percentage that do, will only work as an assistant on their parents enterprise, thus having

little chance to try out in practice what has been learned before. This is the main reason why membership of the 'clubes agrícolas' should be extended in such a way that the farmer and would-be farmer could get full advantage of the instruction given by these clubs.

When the movement started in 1933, 28 members shared the first 'clube agrícola'. By 1949 about 70,000 members had been registered. The meaning of this figure, impressive as it may seem, can only be properly judged when seen as a percentage of the total rural population aged between 8 and 18 years. From private estimates based on the census of 1950, it can be said that this number of 70,000 members represents about 20% of the afore mentioned group of rural population in 1949. This is considered a promising result as it was only in 1940, that the newly founded 'Serviço de Informação Agrícola' thought it its duty to stimulate the institution.

Curiously enough the Salte plan did not mention rural education as one of the most important items of improvement.

The effects of insufficient rural education are apparent in the lack of care for the soil. As has been said before, a number of other factors played their part but nevertheless lack of knowledge of modern agricultural methods, played a big rôle in the way the soil of the country was used, resulting in soil erosion and loss of production capacity.

Soil conservation

The protection of the soils against the destructive effects of rain and wind, the so-called erosion, is a point of foremost importance. Brazilian agricultural methods gave a free hand to erosion as the topography of most parts of the country made agriculture without certain preventive measures a danger to soil conservation.

Examples of waste of soils can be observed in most States. A striking recent example is the northwestern part of São Paulo.

About forty years ago the 'Estradas de Ferro Nordoeste do Brasil' (the Northwestern Brazilian railways) constructed railways opening up new regions in the State of São Paulo. These new regions developed quickly and soon most of the northwestern part of the State was covered by 'fazendas', and little towns and villages sprung into existence. Now, a well known Brazilian rural economist writes in florid language: 'During a recent yourney through the older parts of this region I noticed the destructive power of erosion in spite of the fact that the topography of this region does not build up a great head of water" (the region is rather flat). "A number of the towns already showed clearly signs of premature decadence. Some of them, already abandoned by the population, are starting the sad period of decay and silence. The soil attacked by the water is slashed by gullies and has already the appearance of the face of an old man. Deep muddy holes in the roads make it necessary for vehicles to detour, thus forming new roads which in a short time will also become yawning caverns. The vegetation is growing weaker; the watering places, and the fountains dry out; the river beds suffer from the floods and on the river banks the vegetation is razed by the debris carried down by the river."

In this study only the outlines of a highly technical problem such as prevention of soil erosion, can be mentioned. It seems that the basis for the loss of production capacity of the soils has to be sought in social and economic circumstances of which the more important have already been mentioned before in this study. Deforestation on an enormous scale and the lack of care as far as the organic matter in the soil is concerned, are mainly to be seen as natural consequences of the complex of existing social and economic factors.

The normal practice in Brazil is deforestation without replanting, notwithstanding the fact that it is forbidden by Law. Control is very difficult as there is always some kind of an excuse ready when no new trees grow up: "The seedlings are eaten by

the 'sauva' (the leaf-cutting ants)" is one of the most common explanations.

Losses in organic matter must be tremendous under the rather high temperature and the high degree of humidity. Fire agriculture is mentioned as enemy no 1 of organic matter in the soil. It seems doubtful, whether this point has been studied sufficiently in Brazil so far. Some types of soil when burnt may be more susceptible to losses in organic matter than others. Often a rather dark-coloured top soil, the rough indicator of organic matter, is found under meadows having been burnt again and again over a period of years, but this is by no means the usual case. The arable land and the plantations where the soil between the rows of trees is kept clean demonstrate after a period of years the well known defects in structure. The heavy rains close a tiny upper layer of the top soil, thus prohibiting penetration to the deeper layers. Running down along the surface, every shower takes along a part of the valuable top soil, colouring the water in the rivers to a deep red, or a dull yellow, depending on the characteristics of the soil it carries.

In the initial stages of the process soil erosion does not manifest itself by clear and frightening symptoms. Only when the process is well advanced, it seems as if the productivity of the soils has been suddenly lost. A few years ago this was noticed in the Southern and Central parts of the U.S.A. and now in Brazil the danger is also in evidence.

The condition in which the soil is handed over by a generation to its offspring is considered by the government of the utmost importance. To this end the government seek to assist farmers to preserve the fertility of their soils and to combat erosion, not only for the next, but even for today's generation.

In 1947 the first Brazilian congress on soil conservation was held. The most important works presented at the conference came from the States of Pernambuco and São Paulo, as it is in these two States that the most attention had been paid to this problem.

The situation is grave, as large-scale improvements are extremely expensive and they would exceed the capacities of the treasury. This is the reason for the government's prime interest in stimulating improvements by private 'fazendeiros', by giving educational enlightenment both in theory and in practice.

It is questionable however, whether private fazendeiros in general are financially strong enough to invest the sums needed for the necessary works on their properties and whether they estimate the financial results as favourable as the government consider them to be. The capital shortage and the preference for putting money into more 'attractive' business will probably keep many private land owners from doing much in this field. In Brazil farms do exist on which soil conservation, the use of fertilizers and manure, mechanization and all modern methods are practised, but they are a minority.

In addition to information and advice the government intend also to concentrate all the existent forces in a national department for soil conservation, under the supervision of the Minister of Agriculture. In this department will be combined all federal services for soil conservation, irrigation, reafforestation, drainage and metereology.

The main tasks of the new department will be:

- to carry out important works;
- to co-ordinate local or regional plans;
- to give information and advice to private persons and authorities.

Reafforestation should be an important item in any program for soil conservation. Replanting has been carried out on a fairly big scale in the States of São Paulo, Rio Grande do Sul, Paraná and Santa Catarina. In majority of cases eucalyptus varieties were used because, the tree grows quickly and it is thus possible to cut it in about ten years to obtain railway sleepers and firewood of a fair quality. This tree does not improve soil qualities.

It gives little shade, since the lancet-shaped leaves hang down and furthermore it does not enrich the soil in organic matter because in a eucalyptus forest of six years and older there is no undergrowth. Moreover, the fallen leaves rot very little, because the tree itself absorbs the majority of the moisture available in the top soil. For soil improvement the 'Acácia negra' (the Black Wattle) which is planted widely in Rio Grande do Sul seems to be far more advantageous. It has not the unfavourable characteristics of the eucalyptus and, being a leguminosus, it enriches the soil in nitrogen.

Some railroad companies have contributed to the reafforestation in regions where they operate, and a few pulp and paper mills have likewise played their part. As an example of reafforestation on a very big scale by private companies, the Indústrias Klabin do Paraná de Celulose S.A., a large papermill, are carrying out an enormous plan in the State of Paraná. The industry started production in 1946 and from that time on the capable owners, the family Klabin, planted many millions of 'Pinho Brasileiro', the Paraná Pine (Araucária Brasileira), in yearly increasing numbers. The large property is divided into forestry departments each of which has a greater area than all the Dutch forestry departments together.

It was in the field of reafforestation Brazil obtained the first international assistance. In 1949 an office of the reafforestation of the F.A.O. was instituted in Rio de Janeiro. The office works in close collaboration with Brazilian experts, providing advice to the government.

Fertilizers

The soil was not the only victim of lack of care, generally speaking, neither crops nor animals are treated adequately. As regards crops an expression which is still in use, but which is losing its force is: 'Plantando dá', which means you have only to plant to get a harvest.

The lack of capital in most enterprises made the hoe the only implement on a great many farms. As literally nothing was done but manual planting (or sowing) and harvesting, the use of steeper slopes was only a small disadvantage, whilst in this way protection of the crop against floods was secured. The use of manure was known, but the capital shortage did not allow many head of cattle and the cattle remaining in the open day and night only produced accessible manure during the short time it was in the primitive stable to be milked.

Erosion and exhaustion of the soil made it lose its production capacity rather quickly for chemical fertilizers were too expensive or not to be had at all. The farmer produced mainly to supply his family with food, whilst the 'superfluous' products were sold or exchanged for clothing and a few other elementary necessities. Very large regions of the Brazilian 'interior' have been worked under this system from the time they were first opened up.

Recently one of Brazil's leading rural economists estimated the country's annual needs in fertilizers based on the existing consumption per capita at about

1,655,000 tons of superfosfate,
857,000 tons of salpetre
and 430,000 tons of potassium.

Taking recent figures for fertilizers used in Brazil as a comparison it may be estimated that in fact only 2% of the need is covered.

Chemical fertilizers are considered to be very helpful to increase production but the government do not think it a panacea. Crop rotation, green manure, terracing and contour ploughing are also stimulated by the government services. Amongst the measures which are planned by the government to stimulate the use of fertilizers are:

- state monopolies for the exploitation of the principal phosphate deposits;
- exemption of import duties on machinery to be used in national nitrate industries;

- encouragement of the planting of leguminoses together with the industrialization of soybeans;
- reduction on freight rates for fertilizers and basic material for the manufacturing of fertilizers;
- propaganda for the use of fertilizers particularly through demonstration.

Nothing seems to be planned, however, to reorganize the methods of sale of fertilizers in the country itself, although this must be considered very important. Prices of fertilizers for the rural producer are generally prohibitive and, in practice, control of the quality is usually impossible for the farmer. In most countries such a stage in the fertilizer trade has been experienced and after what has been said before on the subject of transportation and density of population it seems hardly necessary to explain the symptoms. Co-operative purchasing might be a solution, but the co-operative movement is as yet not very strong in Brazil. Distances between the farmers are too great for close contact and a certain mutual mistrust hampers the real success of the co-operative movement. The government stimulate the co-operatives by making propaganda and by granting them certain advantages. An example of a very well organized, perfectly working, and influential co-operative is the 'Cooperativa de Cotia' in São Paulo. This society imports directly from abroad. Having its own trucks and warehouses, it sells the products of its members and furnishes them with everything they need. One of the main reasons why this co-operative thrives is, that the region in which it works has a relatively dense population and it is situated not far from the city of São Paulo with its 2,000,000 inhabitants. The use of fertilizers in São Paulo and specially in the region where the 'Cooperativa de Cotia' is working is more intensive than in any other State. Without doubt the co-operative plays its part both directly and indirectly in achieving this result.

When fertilizers are used and the care for the crop is lacking,

the weeds will take as much advantage of the fertilizers as the crop. Therefore the crop has to be protected by eliminating the weeds. Fighting weeds with a hoe as the only implement in a climate where the vegetation grows very quickly would require a tremendous quantity of human labour. This could not be justified economically as labour is relatively expensive in Brazil, notwithstanding the low wages. Brazil chose the normal solution to this difficulty, i.e. mechanization.

Mechanization

Mechanization in Brazil meets with several severe obstacles. Lack of capital and of credit facilities were mentioned already several times, but other special difficulties must be taken into account. The main crop in Brazil is coffee. The right implements to lay out a coffee fazenda are easily to come by nowadays, but after the fazenda is producing, such implements are not of great use for working the crop. On a producing coffee fazenda an abundance of labour is needed during harvest time, but mechanization of coffee gathering does not yet exist. The washing and drying can be facilitated by the use of machines, the washing might even be made unnecessary by the use of better harvesting methods. Taking all things into consideration, the possibilities for mechanization on the coffee fazendas are very limited. The same can be said of cocoa, oranges and to a lesser extent it applies to tobacco and sugar. In the case of sugar, harvesters are to be introduced in Brazil before long. As the afore mentioned crops do not cover more than 20% of the arable land in Brazil, on the other 80% mechanization could be an easy solution for the problem if there was not another difficulty.

The important Southeast of Brazil is rather hilly. For cultivation with the hoe a slope up to about 35% is still usable as arable land. A change to cultivation with the plough will not only introduce a great change in the significance of slopes in

terms of rural use, reducing the area of arable land, it will also bring on local difficulties in the use of the valleys in which the new arable land has to be laid out. Here periodic flooding of the valleys occurs, making it necessary to pay attention to a new problem, that of drainage.

Taking the afore mentioned unfavourable factors into account it is not surprising to hear Brazilian experts estimate the area which could be worked mechanically at 50% of the total area of arable land. Based on this estimate they calculate roughly a shortage of approximately 14,000 tractors.

The choice between animal or mechanical traction is a problem of no great importance in Brazil. Most enterprises in which an extensive use of implements would be justified, are too big for anything but mechanical traction, whereas smaller enterprises have to use animal traction as their financial resources do not enable them to use tractors.

As a stimulant, the importation of tractors for agricultural purpose has been freed from custom duties by the government. To guarantee that the farmer will get tractors and implements of a proved quality and type, no new make is allowed to be sold in Brazil without a certificate which is given only after the material has been tested by a special government service. The government grant credit facilities to farmers for the purchase of a tractor and also undertake to sell tractors and implements to farmers at cost price.

In spite of the measures above mentioned it is considered that mechanization is developing too slowly and therefore more assistance is foreseen, such as:

- the foundation of a special Central Mechanization Centre, where problems connected with mechanization will be studied;
- mobile patrols for heavy mechanization, which would undertake heavy work such as removal of tree stumps, drainage, irrigation work, etc. at cost price;

- setting up of regional mechanization parks where equipment and mechanics are available to prepare the soil, to sow, to harvest etc. at cost price and where a complete workshop will be installed to carry out repairs for the tractor owners in the region;
- extension of the special mechanization course which already exists in São Paulo on the federal fazenda 'Ipanema'.

When all this is done, mechanization should have shown its advantages in all parts of the country and it is thought that mechanization will be then more rapid. Perhaps more attention should be paid to a special training of tractor drivers as until now they do not exist in sufficient numbers. The step a farm labourer has to make when he changes his hoe and oxcar for a modern tractor with implements should not be underestimated. The high percentage of illiteracy makes this step still more difficult. This is demonstrated clearly when one compares the wages of normal un-specialized farm labour with those of good tractor drivers. The former receives wages which will be around Cr.$ 600.00 a month, whereas the latter can obtain three times or more than this figure since the demand is high and the supply relatively small. For this reason special arrangements, such as travelling instructors for training tractor drivers, either with material they take along, or with the existing material in the region itself, should be worth study.

As far as can be judged, it seems unlikely that fuel shortage in the event of war would be a danger for mechanization, since in recent years several oil reserves have been found in the Northeast of the country, and production on a small scale has already started.

Storage facilities

The realization of all the above mentioned improvements, which can only take place gradually, should give rise to increased

production. This in turn will make the lack of storage facilities even more strongly felt than it is today.

At a first glance it seems incredible that most Brazilian rural producers have no adequate storage facilities whatsoever, but taking into account what has been said about the shifting agriculture, capital shortage and the prevailing primitive methods of production, this is a logical result of the afore mentioned factors.

The consequences for the producer and for the economy of the country as a whole of this lack of storage facilities are unfavourable. The worst of these are that the farmer has to sell his products as soon as possible after harvesting and that, as the harvest of a given product occurs simultaneously over large areas of the country, the capacity of the transportation system is inevitably too small to handle the whole harvest within a short space of time.

The farmer having no storage facilities is in an extremely weak position. Unless he can transport his goods directly to the market he will never obtain a fair price. In Brazil the farmer's possibility to market his own products directly is rare. Long distances, a sparse population and poor transport accomodation prohibit it. Even when these factors are absent there may be other difficulties. For instance, at less than 20 kilometers distance from Rio de Janeiro bananas are grown. Theoretically it should be possible for the producers to market their bananas directly in the city. This, however, is not the case in practice, as the wholesalers form a powerful group, with enough influence on the market to prevent direct sales by the producers on a big scale.

Generally speaking the producer has to sell his products during the harvest to intermediaries at a moment when there is supply in excess. Even if it were only because of the law of supply and demand he will not get high prices. Whether or not the producer can sell his products, depends primarily on the market position in the centres of consumption and on local transport possibilities, which are well known to the intermediaries. It is quite

usual to find reports in the newspapers about rice, maize, potatoes and other products, rotting somewhere in the interior, whilst prices for the same product are soaring in Rio de Janeiro. Often the intermediaries are blamed in such articles, but these intermediaries are nothing exceptional, they are a logical result of the existing production and distribution system and they will have to operate as they do, until the controlling circumstances are modified. One of the important factors which could facilitate this is the extension of storage facilities, both on the farm and in the collecting centres.

For the economy of the country as a whole the lack of storage facilities leads to heavy losses in quantity and in quality of the products. It also gives rise to high consumer prices and generally to inferior quality of the purchased products, lack of stability, shortages, and big opportunities for speculators.

Lack of storage facilities producing low prices discourages the private rural producer. This leads to urbanization, as the owner of the fazenda cannot pay his labourers adequately. This in turn tends to diminish rather than to raise the intensity of farm production. Thus in various parts of Brazil today is to be seen the opposite from what is to be considered normal in most countries with a progressive civilization, where an evolution of a pastoral people to substantial farmers is the normal course of events. In Brazil the period of cultivation of arable land is followed by the use of the land only as pasture. In this way agricultural products get scarcer and more expensive. Thus, the inflation in the country, which is a normal symptom according to some Brazilian economists, is stimulated. The ensuing lack of stability of the purchasing capacity of the money is one of the reasons for the troubles in rural production. The process having reached full cycle, some of the view points of the government about storage will be expounded.

Due to climatic conditions resulting in damage caused by insects and fungi, storage of products in Brazil is more difficult than it is in countries with a temporate climate.

Only few products, such as coffee, cotton, fibers etc. can be stored without special measures, because these do not deteriorate quickly.

Cereals, potatoes, oilbearing seeds and so on have to be protected by special precautions, such as disinfection and humidity control. Fruits, flowers, meat, eggs and milk products cannot be stored without cooling. This makes clear why storage on the fazenda itself usually is unpracticable for a period of any duration, due to the fact that large investments would be necessary. This is the reason the government think it desirable to build central silos and warehouses in the production areas. Here, the production of the region will be stored, cleaned and prepared for transportation. These 'collecting storehouses' will be placed near the lines of transportation and will act as a buffer between production and consumption. The cushening effect of these storage centres should so absorb the peaks of production and regulate the flow of products to the markets, that transportation is facilitated and the market stabilized. Another important function of the storehouses will be their effect as a catalist for credit transactions. Warrants of products stored in modern storehouses have a definite value, and credits will thus be obtained more easily.

As the capacity of the collecting warehouses has to be limited, the products which can no longer be kept there, will have to be stored elsewhere. For this storing the government have in mind to build big central warehouses in the consumption centres and eventually near important railroad junctions. Via these central warehouses, the big consumption centres and exportation will be provided for.

The government plan to establish more than 130 collecting and central warehouses strategically distributed over the country, leaving an opportunity for private interests to organize other similar warehouses.

After the realization of the plans for storing, the influence of the intermediaries will be heavily curtailed, assuming the ware-

houses are under careful administration. Another very important factor which is strongly interrelated with the power of the intermediaries will be the improved credit facilities. Until the present day the intermediaries have acted as the lenders in the interior; more particularly in connection with short-term credits for the farmer. Although the practices vary from product to product and from region to region, inevitably the farmer loses his right to sell his crop freely.

The intermediaries charge a high rate of interest as a result of the lack of safe warrants and of the other factors already mentioned. Sometimes they buy the crop before it is harvested or even before the seed is in the earth. It will be clear enough, that prices are never satisfying for the producer, whether the crop is sold after, or before harvesting.

Artificial measures cannot be expected to change the situation without disturbing the whole system of production. Only the change of the factors mentioned in this chapter could free the producer from 'the yoke of the intermediaries'.

The general improvements, mentioned in this chapter are of importance to all sectors of rural activity. Hand in hand with these, special attention should be paid to the separate crops.

CHAPTER III

IMPROVEMENTS IN THE PRODUCTION OF SOME OF THE MORE IMPORTANT CROPS

In this chapter some of the most important crops will be dealt with again. On this occasion, however, the accent will be laid on the improvements considered urgent in order to stabilize or to increase their production. The choice of the crops is based on their importance both to Brazilian foreign trade and to the home market.

The production of these products is to a great extent located in special regions and it is probable they will not play a big rôle in the anticipated new configuration initially.

From this limitation it should not be inferred that products other than those mentioned would not be potentially important to Brazil's foreign trade, as examples could readily be given of the opposite.

Coffee

Talking with a 'coffee fazendeiro' and asking his opinion as to what could be done to improve the coffee situation in Brazil, his answer probably would be that hardly anything could be better than today's situation. Perhaps he would express a wish for better credit facilities and probably for better roads, but, considering the general situation he would certainly display a degree of satisfaction. Asking him further about his future plans, he would no doubt explain that he had already laid out a new

plot this year of so and so many alqueires [1]) and that it was his intention to plant considerably more next year. If he has not sufficient new coffee soils at his disposal, he will try to buy them, either near his existing fazenda or further away. If he is compelled to buy distant soils he may even sell his original fazenda.

There is a boom in coffee. Prices are soaring, profits made by producers, coffee traders and owners of potential coffee soils are extremely high. Further profits can be made by producing more coffee. This is the way the normal individual producer reasons. To a certain extent he is right. There is, however, a limit of production above which the offer will be greater than the demand. As soon as this limit of production is surpassed, prices will drop precipitously and another coffee crisis will develop. To prevent this, only measures on a national or even an international level can be of any avail. The foundation of the D.N.C., in 1933, came too late to avoid a crisis and drastic measures were by then already necessary. When after the war the equilibrium in offer and demand proved to be favourable for the producing countries, the D.N.C. was liquidated and no production regulation controlled new planting. In government circles this is considered to be a big danger and plans have been made already to supervise production by an other institution, the I.N.C. (Instituto Nacional do Café). In this autonomous institute not only the government, but producers and trade will also have their voice. The institution will have the power to limit production and to lay down rules for classification, trade, storing, etc. Apart from this, the institution will have the means and the equipment to give advice to the coffee producer, as technical improvements on most fazendas are of primary importance.

The reserves in potential coffee soils are few, so the preservation of the existing coffee fazendas, together with eventual

[1]) an alqueire = 2.4 ha in S. Paulo
= 4.8 ha in Minas Gerais an Rio de Janeiro

reclaiming of the abandoned coffee soils, calls for the most urgent attention. The Ministry of Agriculture, via its specialists, does what it can, to show the fazendeiro how to plough and plant to obtain lasting results. Most of the fazendeiros, however, stick to the old-fashioned methods since these seem to give larger and more immediate returns in the first few years.

The afore mentioned fazendeiro, when asked what he was going to do with his profits, answered that he was going to buy more coffee soils, or, if he thought a crisis within a few years likely, that he would probably suggest the purchase of real estate in one of the big cities. The answer "I am investing a big part of my profits in my existing fazenda, by fighting erosion, laying out new plots in the modern way, replacing badly producing trees by young ones, breeding on my own seed beds from carefully selected material, improving the harvesting methods, cleaning, fermentation and so on" will rarely be given. 'Get rich quickly and forget what comes afterward' seems to be still the attitude of the majority of coffee producers. This attitude can be partly explained by taking into account the ignorance that exists in many cases. Although the average coffee fazendeiro may be wealthy, the agricultural education of the majority is rudimentary. The traditional way of setting up a fazenda is also based on the mentality in turn. The normal practice for the would-be producer is to buy attractive land he thinks suitable for coffee. Usually he takes more than he can pay for immediately, the seller allowing payment facilities which are calculated in the price. In this way the producer buys at a fairly high price, and starts his fazenda with little or no money to devote to a proper lay out, even if he had the knowledge to do so. He divides his land into lots and gives each allotment to an 'empreiteiro' (contractor). The empreiteiro builds his own house, cuts and burns the forest, and plants the coffee beans in groups of 5 or 6 in a small square pit. Within certain limits which vary with the customs in different regions he has the right to use the soil for a period of six years. He plants

maize, beans and rice between the young coffee trees, harvests the coffee and sells it for his own benefit, in the meantime not caring about what will happen after his contract expires and he has to hand back the plantation to the proprietor. Thus only after a six-year period the fazendeiro owns the coffee his fazenda produces, but he then possesses an already badly laid out fazenda with an exhausted top soil. As will be appreciated he pays very dearly for the work of planting and laying out his fazenda.

Of course this is not the only way of contracting, but, as it gives the most typical explanation of the symptoms one observes when visiting a coffee fazenda, this one has been mentioned.

The maintenance of the fazenda is carried out by 'colonos', the permanent labourers of the fazenda, who receive a house, a plot of land for a vegetable garden, a plot of meadow for a pig and a few chicken. They may or may not be allowed to plant their own crops between the rows of coffee. Each colono maintains his own plot, the extent of which depends on the number of hands in his family.

The harvesting is done by the colonos together with travelling groups of coffee harvesters, who are paid per weight of harvested coffee. The berries are stripped from the branches and picked up from the ground together with earth and dust. After the harvest the trees look rather naked.

After what has been said above to give a rough sketch of the normal coffee fazenda in Brazil, it will be clear that technical assistance and counsel are necessary and will be able to make big improvements. The most difficult factor to be changed, however, is the attitude of the producer towards his soil. Only after this attitude has improved radically, either out of necessity or via education, will the whole system of production improve, to the benefit of the individual producer, his offspring and the country as a whole. This is the objective for which the government are striving as far as the management of the fazendas is concerned.

A careful regulation of production together with adequate technical assistance and information are the foundations for a

sound coffee production policy, contributing towards wealth and stability in the country.

Cotton

To have a basis on which improvements in cotton production should rest, it is necessary to know the factors which stimulated, or hampered the culture in a former period.

Looking at diagram XII and the table on page 77, it is remarkable to see the acute decline in production after 1944, bringing it in subsequent years to the lowest level, lower since 1935. Diagram III shows that this decline in production was caused by a decline in the cultivated area and in addition by a smaller yield per hectare as well. From this it can be supposed that two different groups of factors co-operated to produce this result. The former may be called general economic factors, the latter agricultural technical.

To explain the general economic factors it should be borne in mind that specially in São Paulo, more than 50% of the production comes from small land owners, tenants and share croppers. These economically weak groups had to contend with quickly rising costs for labour, implements and fertilizers (cotton is one of the few crops for the production of which fertilizer is in common use). They did not receive reasonable financial support nor could they obtain credits except from the intermediaries. All this might not have been the cause of such a heavy decline perhaps, if prices of the products had gone up in the same proportion. The cotton prices did go up, but the price of the seed was fixed by the government, to help the consumer to purchase cottonseed oil at comparatively low prices. Before 1944 the proportion between the prices for raw cotton and for seed was about 13 to 1, whilst in 1946 it was already 25 to 1. As the ratio in weight between raw cotton and seed is about 1 to 2, in 1944 the producer received 2/14 of his income from the seed, but in 1946 only 2/26.

The economic factors mentioned above caused a serious exodus of tenants in the State of São Paulo, which was facilitated by the

increasing industrialization for which labour was scarce. Thus between 1944 and 1947 the number of tenants dropped from almost 52,000 to around 30,000 in that State.

Progressive soil exhaustion due to inadequate agricultural methods, lack of soil conservation, unfavourable climatic conditions and new pests were the main agricultural technical reasons for the decline in yield per hectare.

Cotton as a crop is a heavy tax on the productivity of the soil, especially when no system for crop rotation is practised, to prevent the soil becoming barren. On the sloping lands which are widely in use for cotton growing in Brazil, crop rotation alone cannot prevent erosion and therefore contour ploughing and eventually strip cropping are also necessary. Although there are farmers who take care of their soils in this way, and use enough fertilizer, the general practices are still far too careless. A campaign to improve the agricultural methods in cotton production, led by a well organized federal service, therefore may be of great use, both for the cotton production itself, and for soil conservation in the cotton districts.

The economic conditions will remedy themselves gradually with the general improvements, mentioned in the former chapter. It is not to be foreesen whether a revised price regulation for cotton seed will be necessary or not under the improved conditions. In general, however, a regulation which establishes prices that differ widely from the free market prices, will unvariably bring about disturbances much more harmful than might be initially anticipated.

It might be helpful to increase the facilities for the producers to process their own product either co-operatively or in government-installed plants. This would enable them to choose either to sell their product as seed cotton, or as baled cotton and cotton seed, thus curtailing the power of the processing plants to dictate prices.

As the improvements in the production of 'dry rice' may be obtainable when still better varieties are grown and the general factors mentioned in chapter II are changed, no further attention will be paid to this – nevertheless important – part of rice cultivation.

The first impression one gets by looking at diagram IV and XII is that rice production is thriving in Brazil. There is no doubt about the correctness of this impression. The yield per hectare, apart from oscillations, due to climatic conditions and pests, such as locusts, shows a general upward trend. The area is extending and especially in Rio Grande do Sul the future possibilities for a larger irrigated rice production seem to be very favourable. A State commission – a Comissão Estadual de Obras de Irrigação – studied these possibilities carefully and came to the conclusion that at least 1,100,000 hectares in the State of Rio Grande do Sul, suited to fully mechanized rice production, could be irrigated. This is five times the rice area of that State in 1948. Moreover a further 1,000,000 hectares less suited to mechanized agriculture could be irrigated. For this irrigation dams would need to be built, for the storing and easy distribution of water. Construction of dams is expensive and because capital is short in Brazil, the total realization of the projects cannot be anticipated within a very short time. An unfavourable circumstance should be mentioned in connection with irrigation projects, i.e. the lack of co-ordination between the plans of the State government and the I.R.G.A. (Instituto Riograndense de Arroz, this is the Rice Institute of Rio Grande do Sul). The I.R.G.A. has already built several dams and others are under now construction. They have financial means to carry out their plans which the State government had not. It would be a pity however, if the works the I.R.G.A. is executing now, do not fit in with the program the government have already made.

Price regulations for rice have already caused severe criticism

within the ranks of the producers several times and even in government circles such criticism is heard. The fact, that taxes are levied on rice to the benefit of special groups of consumers, is cause of the criticism, for in this way, the producer supports a certain section of the consumers. This in turn reacts on the part of the community which does not benefit from the tax.

As long as there was a sellers market for rice, exportation was not hampered by an export tax of Cr.$ 10.00 a bag, but after the sellers market changed to a buyers market, a disparity of 5% made all the difference. If the export tax were used to improve the conditions of production, this could have led to lower production costs and increased competitive power might have been the result. The income was used, however, to lower the prices for rice in the towns of Rio de Janeiro, Niteroi and Campos, thus making the position of the producer more difficult, without giving him any compensation. Many people think the solution is either the freeing of price control, or having the price policy modified in such a way, that all special taxes levied on rice, would be used only for improving in rice production. Any measures which are leading to an increase in the price of the product should be avoided at all costs.

Immense progress has been achieved in rice production in recent years. It seems however, that a change in price regulations, to meet changing market conditions together with further mechanization and the realization of proper irrigation plans might still stimulate production. Further research and information could no doubt increase the yield of existing areas. The political situation in the previously important rice-exporting countries of the world might prove to be an advantage for Brazil.

Cocoa

In June 1947 at the cocoa conference in Washington the chocolate manufacturers had several faults to find with Brazilian cocoa. It was generally considered that the fermentation and drying was

not carried out in a way to permit normal processing. The smoky taste or ham-flavour should be avoided, the manufacturers thought, by careful fermentation. Improvement of the quality might make it possible to raise the percentage of Bahian cocoa in the blendings, above the present 50% nowadays.

The primitive fermentation and drying methods were already mentioned but improvements under present day conditions seem difficult to achieve. One of the leading cocoa producers and exporters, when interviewed on the subject of better fermentation, washing and drying, declared that he did not think it an advantage notwithstanding the higher prices the United States market offered him for the improved products. He thought it difficult to teach modern methods to the people in the interior and was of the opinion that the difference in price would not compensate for the loss of weight, the necessary capital investment and the complications he would encounter in trying to change the old-fashioned methods. This opinion may be correct for the time being but when other cocoa-producing countries are improving their quality and Brazil lags behind, this country will be left in a very unfavourable position. Therefore, improvements will be indispensable if the country wishes to hold the position on the cocoa market it has at present. Persisting with old-fashioned methods will result in the gradual loss of this position.

Not only improvement of the fermentation and the drying process is deemed necessary by the government but also an improvement in cocoa growing is of importance.

The resources of the experimental station in Uruçuca maintained by the Instituto de Cacao are considered inadequate to produce the necessary results and therefore these resources should be augmented. The experimental station already supplies the fazendeiros with selected planting material. Extension of this service would be valuable, for the laying out of new plots and for the renovation of existing ones. Propaganda should be made to introduce modern methods and to combat diseases and pests,

whilst introduction of new diseases which are not yet known in Brazil, such as the 'swollen shoot' disease should be prevented by rigid control of any imported plants.

Progress in cocoa production and quality will be slow and difficult as long as the experimental station in Uruçuca with limited resources and sphere of action is the only driving force, notwithstanding the activity and profound knowledge of its director. Therefore a heavy responsibility lies on the shoulders of the big producers who have the means to put improvements into effect, and have the intelligence to look for the future wellfare of the State, as also of the cocoa interests themselves. These men only could show less advanced producers the results of full scale modernization. Their troubles and sacrifices would be largely compensated by the better results they would obtain themselves within another ten years and, moreover, in the satisfaction of the idea that they would have contributed their share in the improvement and consolidation of the economic position of their State and, thus, of their country.

The improvements in the production of separate crops, important as they are, can never bring about the optimum results without the general improvements mentioned in Chapter II of this part. A change in the lay-out as far as localization of the production zones is concerned is thought to be necessary. In the next chapters the possibilities for a better rural configuration will be studied which should help to strengthen the rural aspect of Brazilian economic life, and consolidate the economic position of the country as a whole.

CHAPTER IV

A POSSIBLE FUTURE RURAL CONFIGURATION

> "*Anyone who asserts that so-and-so is* the *cause of a social phenomenon is bound to be wrong: it can at best be* a *cause.*"
>
> Julian Huxley in 'Eugenics and Society'

The fundamental circumstances which should be borne in mind when indicating a possible future configuration for rural Brazil may be summarized as follows:

Land. There is an abundance of land in accessable regions. The natural production capacity is low as the land has been exhausted. The greater part of this land is in private hands. Relatively small and remote zones in the accessable regions have a high natural production capacity. They are used in the main for the production of coffee, since other crops cannot be produced economically due to high transport costs. The value of land in terms of money is rather vague since the production capacity of the land normally plays a subordinate rôle in such a calculation and speculation predominates. The ownership of the land and the size of the enterprises seem little suited to giving the highest production (table page 52).

Capital. Most rural enterprises in Brazil are undercapitalized. Credit facilities are inadequate and rates of interest very high.

Social conditions. In the interior social conditions could be considerably improved. The capacity of the labour is relatively

low; many employers and most of the labourers have little or no knowledge of modern methods; the diffusion of scientific finding from the experimental stations to the farm is slow.

Localization of production. Although monoculture still prevails, polyculture is increasing. Concentration of the production of some products exists, for instance in the coffee zone of northern Paraná, the citrus zone of the Federal District, the cocoa zone of Bahia, various sugar districts, etc.

Most of the crops can be grown throughout the country, so the seven principle crops of the highest value, with the exception of coffee, are grown at least in every State South of the Amazon region. These seven crops are: maize (16%), rice (15%), cotton (14%), sugar cane (8%), manioc (7%), beans (6%), and potatoes (4%). The percentages are based on the total value of all crops in 1948. Coffee, with a value of 20% of the total, can be grown everywhere in Brazil, north of the frostline. Cattle for meat production, the value of which may be estimated at about 24% of the value of all crops, exist in every State of the republic.

Co-ordinated planning as to the localization of production zones for most of the products has been rare. Transportation of products is difficult, on account of the enormous distances, topographic hindrances, and a rather poor rail and road system. The lack of suitable waterways from the main production zones to the consumption centres should be borne in mind as also the lack of storage facilities in the production zones.

Economic position of the rural producer. The influence of the intermediaries on trade in general is important, and the economic position of the rural producer is weak.

The following points are some of the more important consequences:

1 – much land suited to rural production, either is not used at all or, if it is used, the methods employed are often primitive;

2 – the production per unit of area is low;
3 – the prices the farmer obtains for his products are low;
4 – as a result of points 2 and 3 the income of the farmer is unfavourable when compared with the area of land he occupies;
5 – the prices of prime necessities in the larger centres of consumption are high and have the tendency to rise steadily;
6 – urbanization is a trend.

From this it may be concluded that augmentation of the rural production most probably will not be attained without a change in the circumstances mentioned in the beginning of this chapter.

One of the principle and basic laws of strategy is quoted as follows: "Never fight without a concentration of your forces at one point." In the rural economic battle which Brazil is fighting, there should also be a point of maximum concentration. It is suggested that this point could be the concentration of intensification of rural production in regions near the urban centres. Without focussing the forces of the nation on some such limited objective, the efforts of the nation would tend to be dissipated in the vastness of the country and progress will be slow.

The concentration of a part of the production in regions not far from the centres of consumption, would lead to the following configuration: The smaller but capital-intensive enterprises, such as poultry and truck-farming, should lie nearest to the centres of consumption. Dairy and crop farms should occupy the next zone, while further away from the cities cattle ranches should find their place. This is the normal configuration in the majority of highly developed countries.

Following the points mentioned in the beginning of this chapter in the same sequence, some of the more important direct results of this change are likely to be the following:

Land. Unproductive lands near the centres of consumption would be brought into production.

Capital. Enterprises would be in a better position to obtain credit facilities, as control would be easier and there would be a higher degree of security for the creditor. Furthermore, in a concentrated agriculture, transport and storage problems are far easier to solve than when the producers are widely dispersed. Investment in transport facilities and storage would yield a higher return and would attract private investors.

Social conditions. Due to the higher capital investments in the enterprises the productivity of labour will be higher and as a result the economic circumstances for the labourers would tend to improve.

Education and physical care for the rural population would be easier to effect and this, in turn, would raise the labour productivity.

Economic position of the rural producer. The influence of the intermediaries is likely to diminish and the economic position of the rural producer would be correspondingly fortified.

Valuable as these results would be it is still a mute question whether or not this kind of concentration would be justified from an economic standpoint. It might develop, due to a diversity of reasons, that the production costs per unit of weight in the new areas would be higher than they are now, or, what is more important, that the prices the consumer would have to pay for the products would be higher than under present circumstances. For a satisfactory answer along theoretical lines, one would have to make a careful study of wages, prices and social environment. Data of this nature are difficult to obtain and suffer from serious discrepancies between different regions of the country. Theoretical studies thus will not lead very far, but practice shows already some favourable results of concentrating. Examples of concentration near the centres of consumption on a big scale cannot be given, but intensified enterprises, not far from the cities, have arisen in the last few years and their results seem promising. The

Baixada Fluminense, the coastal lowlands, recently drained by the Brazilian government, are beginning to deliver maize to Rio de Janeiro at prices against which the product from São Paulo cannot compete. Poultry farms not far from Rio de Janeiro and São Paulo, with a modern lay-out bring the owners high returns. Modern dairy farms not far from São Paulo with sufficient capital invested are prospering. Truck farmers near these cities working intensively and with skill also seem to obtain an adequate return.

When all this is possible without the existence of the direct effects on marketing which the concentration on a big scale is likely to have, it may be safely anticipated that this concentration and intensification will give favourable results, both to the producer and to the consumer.

The new configuration may be one of the solutions for the basic problem, but another possibility which is not so spectacular a change, is the further stimulation of the industrialization of farm products. Bearing in mind the seven most important agricultural products: coffee, maize, rice, cotton, sugar cane, manioc and beans, it should be noted that industrialization of sugar cane in the production centre itself is essential whereas for the ginning of cotton it is desirable. For the other products industrialization could be carried out elsewhere as the transport costs for the raw product do not differ greatly from those for the correspondent products. Conspicuous, however, are the advantages of processing in the sector of animal husbrandy. The difference between the weight of the living animal and the dressed carcass is important. Still greater transport advantages can be obtained when a real packing industry is established, as handling costs for packed products are appreciably lower.

As the government already pay much attention to the industrialization of farm products, much in this sector may improve before long.

Looking back at chapter II of part II it is striking to notice how the realization of all the general improvements which have

been mentioned could be greatly facilitated, through the development of the new configuration.

There are several obstacles which must be overcome before a change in rural Brazil such as that previously indicated can be realized. Some of the most prominent will be mentioned hereafter.

Generally the basis of rural enterprise is the land. In the beginning of this chapter it has been said: "There is an abundance of land in accessible regions..." However, it is not the existence, but the availability of the land that counts for the would-be rural employer.

Most of these lands are in private hands and most proprietors look upon the land as a speculative object rather than as a production factor. Hence in practice it is not so easy to find land for rural enterprises in regions from where there are good transport facilities to the big markets. In fact, the regions near the big cities are desirable for purposes other than agricultural production. One of the outstanding examples are the mountain zones near Rio de Janeiro, which are sought after as sites for summer resorts for the more wealthy part of the population of that city. This is understandable as the summer in Rio is tiring and week-ends spent in the cool of the mountain prove very attractive after five days in the city. It may even be seen as a necessity. The effect is, to elevate the prices of land suitable for selling in small lots to an artificial level. This applies to a lesser extent to any land in the surroundings of the cities, thus making acquisition impossible for the farmer.

These high land prices are a big impedement to a concentration of rural production.

Theoretically several solutions exist for surmounting the difficulties of the high land prices. The most drastic one would be ex-propriation of the lands which are thought suitable for rural production within a certain radius from the big markets. These expropriated lands could be leased to rural producers and eventu-

ally sold to them under special conditions in lots of an adequate size. This solution is crude, expensive, and an offence to the sense of justice of the majority. A more subtle method would be to stimulate the land owners in the use of their lands for productive purposes, rather than for speculation. Special land taxes in the regions chosen for intensive rural production could perform this. If the minimum tax was to be based on a rural enterprise with an amount of capital per hectare calculated to be near the optimum, and if, with some tolerance, the taxes for less capital-intensive enterprises in the region were made a manifold of the minimum, the proprietor would be forced to use his lands for productive purposes to escape the very heavy burden imposed by the tax. The selling in small lots for summer ressorts could be kept in check by the same system.[1])

Under this scheme the owner is not necessarily driven to sell his land in lots of an adequate size to the producers: since as soon as he lets his lands to tenants the taxes would be at a minimum, if it is assumed the tenant will put enough capital into his enterprise. Perhaps this in turn would lead to a good co-operation between the land owner and the tenant in such a way that the land owner might become interested in assisting the tenants with long-term loans under reasonable conditions to purchase the necessary capital goods.

The general question of whether the rural producer should be the owner of the land he uses, or whether there could be another solution, has been discussed by many specialists the world over. The answer cannot be a direct one as it depends on diverse factors. In practice both ownership and tenancy have shown an

[1]) One could imagine a system based on a general farm, producing one or more crops, milk, eggs, pigs and perhaps some meat, intensively managed and with enough production to guarantee the producer a fair income. When for the calculation of the capital-intensivity all buildings for boarding purposes are excluded, summer ressorts in the rural production zones could be heavily taxed as well.

ability to bring about favourable results. Arthur Young's statement: 'The magic of property turns sand into gold' may, like most aphorisms, contain some weight of truth, but it is not based on scientific research. Young's obervations were based on conditions in northern Europe where he saw how small proprietors, working like slaves on their plots of poor land, had increased the bearing capacity of the soil to an incredible degree. On the other hand, he might similarly have praised tenancy by observing the gardeners and truck farmers near Paris, working on their tiny plots of rented land and obtaining a fair income.

The obvious advantages of ownership are the following:

- land prices in most countries have the tendency to rise and, therefore, the owner gets an increment of wealth when expressed in terms of money;
- ownership guarantees the continuancy of the enterprise to a maximum degree;
- ownership safeguards the farmer from interference and makes him feel a king on his property.

On the other hand, tenancy has the advantage of making it possible for the producer to put more money into his 'business' as he does not have to invest a part of it in the land. Hampson gives some interesting figures which are taken from research in the U.S.A. He stated that for a certain net income the producer who rents his farm needs an investment which is only one third to two fifth of the investment the producer has to make who owns the farm himself.

Whether the advantages of tenancy will compensate for the loss of the prominent advantages of ownership will depend largely on the circumstances.

In a country with perfect laws to protect the tenant most of the disadvantages of tenancy will carry little weight. In Holland, for instance, there are scarcely any advantages to be derived from being a land owner. The tenant can only be removed in rare

cases, thus the continuancy of his farming the land he rents, is highly guaranteed; the advantage of a rise in land prices is neutralized by heavy taxes and the interference of the land owner is limited.

In countries, however, where no such special laws exist to protect the tenant, all he can do is to try to obtain a favourable contract, and hope for the best. In practice, even the best contract will not be good enough the moment the land owner breaks it, because then the tenant has to bring an action against the owner, which is a rather expensive proceeding.

Another general question which has also been studied by scientists of various countries is whether a tenant should pay a fixed rent in money, or if he should pay with a part of his crop.

Most specialists agree that a fixed rent tends to higher intensivity as the producer knows he will be the owner of everything produced on the farm, whereas the share renter knows that the increase of production will be only partly to his own benefit. In other words: the more capital and labour the share renter puts into his business, the bigger will be the profit for the land owner. On the other hand, the share renter will be in a better position than the tenant who pays a fixed rent, when market prices decline to the point where the farm becomes a marginal enterprise. The share cropper, bringing in only his labour is in the weakest position and can hardly be regarded as a tenant in the usual sense of the word.

The tenant who pays an agreed amount of the crop (not a percentage), as a 'standing rent' is perhaps in the most favourable position. In this system the land owner usually furnishes the estate only, the same as with cash renting. The advantage of the standing rent system is that, when prices are low, the rent is also low and, when prices are high, the rent is high, but payable just as easily. The system has much in common with the cash rent system with a sliding scale, going up and down with the prices of the farm products.

In Brazil tenancy is not very favourably placed. There are no special laws protecting either the tenant or the land owner; in general the leases are of a short term and the tenants have little or no capital. These are some of the reasons why tenancy has never been very popular in this country.

In the meantime the very high land prices and the shortage of capital seem to point to tenancy as a possible solution. If it were to be adopted on some scale within the new configuration, the afore mentioned special tax system would have to be complemented by new tenancy laws. These would not only have to protect the tenant and guarantee him continuancy, but at the same time they should protect the land owner against reckless exploitation of his lands.

Cash renting or standing rent, advantageous as they may seem is considered difficult to adopt in Brazil, as for either the would-be tenant must supply not only his labour, but also all the working capital. Most would-be rural producers, however, do not have enough working capital to make this system feasible.

Perhaps in some cases a special form of lease which has reportedly produced favourable results in recent years in the U.S.A. could also be adopted in Brazil. This special form of lease makes the relation between the land owner and the tenant a form of partnership, in which the land owner furnishes the estate, and the tenant supplies the labour; together they supply the working capital. The land owner supervises and gives recommendation in consultation with specialized government services. Gains and losses of the enterprise are shared by both parties. If all problems are handled in a businesslike and friendly manner, this form of lease should bring advantages to both parties, for it combines many of the better features of cash renting and share renting. Much will depend, however, on the question as to whether the tenant is trustworthy or not and whether the land owner has the capacity to supervise and to give proper counsel. This special form of lease will probably not be possible on a large scale in the near future.

As a consequence of what has been said on the preceeding pages a new difficulty seems to have been exposed, i.e. the lack of rural employers with enough capital, even to start as a tenant. The lack of a class of substantial farmers has already been intimated earlier in this study. In most countries it is from this class the future tenants and owner-producers derive. This class not existing on an adequate scale in Brazil, a solution could possibly be found in immigration. The immigrants, necessary for this purpose should be, however, of a special type. They should not provide labour only, but also be able to bring capital into an enterprise. This kind of immigration indeed is stimulated by the Brazilian government. In an agreement with the Netherlands, for instance, the immigration of groups of farmers is facilitated, and the entrance of working capital in the form of cattle, farm machinery, and implements is stimulated. Since the war, the export of large amounts of capital from most countries is not permitted, whereas, on the other hand, amongst farmers with enough capital to earn a good living in their own country the tendency to emigrate is smaller than amongst the poorer ones. Thus the influx of this special type of immigrants moves slowly.

Nevertheless a beginning has been made and emigration from Europe is likely to be stimulated by the political world situation. Those who have experienced a war in their own homeland are more inclined to take risks and endure the hardships attended on emigration to a new country.

The special kind of immigration envisaged will not only be useful in the new configuration, because of the influx of capital, but other advantages, especially rural technical and sociological ones, may be expected to follow.

The rural technical difficulties to be overcome to reach the afore mentioned configuration involve the bringing into production of lands, which have always been thought unsuitable for any kind of agricultural production. The lands on which the

primitive system and fire agriculture have been practised are usually covered with a poor herbaceous type of vegetation and show varying degrees of erosion. Before the establishment of rural enterprises on these lands can take place, research and experimental work will have to be carried out to avoid fundamental mistakes. Some research has been done already and experimental stations are studying the matter in loco, but much has still to be done to make a change on a big scale possible.

Even if results of the research and experiments are to hand, the establishment of a rural enterprise on the 'campo' is a difficult undertaking, for which labour, skill, capital and driving power are vital necessities. This interlinks the difficulties of a rural technical character with those of a social and economic nature.

The social difficulties are mainly to be found in the facts that the rural population, living scattered over enormous regions, have little or no schooling, the percentage of illiterates is very high, the physical condition of the rural population leaves much to be desired and consequently the labour capacity is relatively small. The migration of parts of the population from far regions of the interior may be possible without much trouble, as the labourer tends to be attached to the State in which he was born, rather than to the particular location where he lives. A migration of this type, however, is not likely to take place on a big scale as will be made clear in chapter V.

It is sometimes thought that social ills can be cured by treating the symptoms. A better policy in this field, however, seems to be to teach the labourer how to earn more by producing more; to strengthen his physical and mental forces by teaching adequate alimentation and hygienic measures, with the assistance of specialized schooling. All this can be achieved more easily when the rural population is located nearer to the centres of consumption, than when it is scattered sparsely all over the country.

Nowadays the complaint is only too often heard that there is labour shortage due to the urbanization of great numbers of

farm workers. As soon as the farm labourer is sufficiently advanced to be economically entitled to better living conditions, and acquires enough capital goods to work with, the urbanization will stop and eventually may even change into an opposite movement.

The rural technical difficulties may be overcome more easily by European immigrant farmers, who have been accustomed already from his early years to a more intensive type of farming. Their general farm education and training give them a good background to understand the new problems and when they cannot solve them on their own, they will more readily ask for the advice of a specialist as they were accustomed to do in their own country. This does not mean that the immigrants will overcome the problems without encountering difficulties, on the contrary, they will probably know hard times. Only those having the initiative to reach their aim against heavy odds should try to emigrate, as in a new country everything is far more difficult than at home. The 'survival of the fittest' may be the natural law, but as it works rather slowly, the Brazilian government consider it better to attract selected farmers, in order to avoid failures as much as possible and thus to obtain more lasting results.

In sociological matters the influence of the immigrant farmers could be also beneficial. The cultural standard of most of them will be higher than that of their rural labourers and than that of the small independants, living in their surroundings. On the other hand, the immigrants will have to learn a great deal from the people amongst whom they have come to live. To a fairly large extent the immigrant will be dependent on the friendliness of his neighbours. In most cases this will not be too difficult as the Brazilians of all classes are courteous and obliging people with whom it is easy to live as long as the immigrant observes existing customs. Based on mutual advantages a close co-operation between the immigrant and the people of the country may spring into existence to the benefit of both.

Another complex of circumstances may be mentioned as a hampering rather than as a stimulating factor. This is the weak economic position of the group of rural producers as a whole.

In Brazilian commerce a strong tendency exists to monopolize a trade. This trend seems to be contradictory to the highly individualistic nature of most Brazilians. An explanation perhaps could be that the individualistic character is not so strong as the desire to obtain high profits per unit. Commerce is thus organized in a manner which brings great benefits to the members of the organizations. The counterparts of these benefits, however, are disadvantages for other groups. Both the producers and the consumers pay for the advantages the members of the monopolistic commercial organizations obtain. The group of industrial producers, being in an easier position to concentrate their forces, is also able to form strong organizations. The group of rural producers, however, is not so easy to organize as the number of producers is very large and the possibilities for communication between the members of the group are few. The group of consumers is also in a weak position, as their organization in purchasing co-operative societies is no counterforce of any importance.

In Rio de Janeiro, for instance, it is quite normal to experience acute shortages in prime necessities of living. Most of these shortages seem to have as a background speculative movements, well known in all countries where the capitalistic system has not been modified in such a way that these speculations are kept in check.

A concentration of the rural production in zones nearer to the consumption centres would make it easier for the producers to form strong co-operative societies. This would enable them to obtain fair prices for their products and, at the same time, to purchase their requirements for their farms. Improved marketing methods would be achieved and both producers and consumers would be benefitted considerably.

A number of factors may facilitate a concentration of rural production. It is generally considered that recuperation of soils under tropical and semi-tropical climates is much easier to attain than in temperate regions. The influences which lead to a quick decomposition of the mineral reserves in the soil may be considered advantageous as soon as erosion is kept in check. Furthermore, the same influences will induce a rapid decomposition of the organic matter in the soil, thus making the advantages of green manure greater than under less favourable circumstances. Natural circumstances in Brazil seem to be favourable to a concentration of rural enterprises, even in regions where the greater part of the natural producing capacity of the soil has been lost.

Certain human factors lead in the same direction. In recent years the Brazilian rural producer has become more erosion-conscious and is learning to pay more attention to green manure and fertilizing. Fertilizer plants are erected and the imports of fertilizers in 1950 reached a figure never previously exceeded. For these reasons the reutilization of the depleted soils is more likely to be undertaken.

Another important item in this respect is the fact that the value of good seed is appreciated more and more every year and the same can be said about the use of insecticides and fungicides both of which are fabricated in the country itself on an increasing scale, in addition to the growing importation. The increasing use of farm machinery and better implements leads in the same direction. Rural education and special training of rural employers and employees react likewise. The government services, whose task it is to further these causes, have already done valuable work and they still have a worthy rôle ahead of them.

Apart from rural technical factors which might have a stimulating influence in the afore mentioned direction, the improvement of the transportation system has to be mentioned. Progress has already been made, as, for instance, the new magnificent concrete road leading from São Paulo to the town of Campinas,

a distance of an odd 80 km. As the latter town is surrounded by soils which are suited for intensified rural production, the road shows already its favourable influence. It is particularly in this region, that new modern rural enterprises have sprung into existence, which, with the use of adequate capital, seem to be giving good returns.

Modern means of transportation, such as the modern types of trucks, jeeps and such-like are very helpful for transportation within the regions themselves, the secondary roads being, as a matter of fact, not very good.

The railway transport, although perhaps of less importance in this respect, can also be a stimulating factor. In the last few years a rather important vegetable and fruit producing centre not far from Rio de Janeiro has been developed. The government provided better railway transportation from the region and the business has improved still more.

Improved coastwise shipping will be of importance in this respect, but it may be looked upon as more important for the transport from regions, further away from the big consumption centres.

A point, which is of an internal political nature, should be mentioned as a factor which could have some influence on rural concentration.

It is sometimes considered that 'empty spaces' might attract people of the densely populated areas in the world in a way, which could be dangerous for Brazil. Migration of nations, bringing along wars and important changes in the political world picture are well known and, therefore, the danger of the open spaces should not be neglected. On the other hand, the countries of the Western Hemisphere have all a comparitively low density of population, and an invasion from Europe or Asia seems rather unlikely. Thus the danger for Brazil should not be overestimated. Apart from this, filling up the very scarcely populated parts far in the 'interior' of the country, is not economically justified, as

long as large areas far more favourably situated, are still 'empty', i.e. not in use for economic purposes. The 'danger of the open spaces' is not to be eliminated by populating them with people who cannot produce economically for the big markets. Producers in those remote regions will only attain a very low standard of living and thus they will not help to fortify the strength of the nation. On the contrary, the capital that has to be invested to open up these regions – be it even in a rather primitive way – will not bring adequate returns.

In the same way as it is not advisable to withdraw money from a new industry, or to use a child as donor for a blood transfusion, it is judged inadvisable to put money into far away 'empty spaces' as long as nearby 'empty' spaces demand all the attention and investment available.

A coffee boom or any other boom may bring wealth to a relatively small number of people. It may result in a favourable balance of payments for the country and bring along some other advantages for the country as a whole. A boom will always end one day, however, even if an attempt is made to keep it going by artificial means. The only real backbone of a country is a well-balanced economy with the highest possible degree of continuity. To achieve this, it would be helpful if the great part of both state and private investments were used for the intensification of production in nearby rural zones. Thus, investment could be more remunerative and bring about a general raise in wealth and improvement in social conditions. After this limited objective has been reached, a gradual and carefully planned opening up of other regions could be a natural further rural development.

Presuming for a moment, that the view points of the government in the matter of intensification would be more or less as has been described on the afore going pages of this chapter, well balanced planning should be considered as of the utmost importance.

After having determined the location of the zones which should be intensified in first instance, plans should be made for the development of communication, financial measures should be studied, experimental farms instituted and provisions planned to prevent the distribution of the product falling into the wrong hands.

This task, which the government eventually might have to undertake is perhaps less ambitious than the Salte plan, nevertheless it should not be underestimated.

If it were found necessary to ask financial help outside to realize the plans, it is thought that this could be more easily obtained for local plans, of a limited nature, than for larger schemes which are necessarily more vague.

Of the stimulating factors which have been mentioned already, one has an international bearing, i.e. the immigration. Another point of purely international character is the international co-operation within the United Nations and its organizations from where assistance might be obtainable. From this organization, experts could be sent to the country to study some important questions in close co-operation with the Brazilian authorities. In the rural sector it is the F.A.O. which perhaps could do some valuable work. Up till the present time only a forestry office of the F.A.O. is located in Rio de Janeiro, but the location of the regional F.A.O. bureau for South America in that city has already been promised.

The United Nations are not the only 'foreign' source of assistance. The close co-operation between the U.S.A. and Brazil can be of great importance for the concentration of rural production. During the war, studies of the Brazilian economy were made with the help of North American experts (Cooke mission). The main purpose of these studies was to investigate the means by which Brazil's participation in economic warfare might be augmented. After the war a Joint Brazilian United States Technical Commission (the Abbink mission) studied aspects of Brazilian peacetime economy.

In the beginning of 1951 a permanent Joint Commission was instituted under the leadership of Truslow[1]) (U.S.A.) and Arí Torres (Brazil). The commission will not repeat the work of the Abbink mission but will use it as a basis for further studies. Presumably it will give advice, not only to the Brazilian government but to foreign investors and financial institutions also.

It is probable that the commission will pay much attention to agricultural and transportation problems whilst its reports should have a favourable influence on the possibilities of obtaining foreign investments and loans.

To conclude this study, in the next chapter an attempt will be made to discover some of the important subsidiary effects resulting from the changes in the agricultural pattern, already suggested.

[1]) On his trip to Brazil he died.

CHAPTER V

SOME PROBABLE CONSEQUENCES

Supposing that a change such as has been prognosticated in the former chapter had occurred, what could be the subsidiary consequences? With a slight modification the citation in the beginning of chapter IV of part II could be read: Anyone who asserts that so-and-so will be *the* consequence of a social phenomenon is bound to be wrong: it can at best be *a* consequence.

A higher standard of living of the rural population, improved social conditions in the new production region and a lowering of the costs of living for the urban part of the population, are considered some of the probable fundamental consequences.

It should be noticed that these results seem rather advantageous for the town people and those rural producers who live in the intensified regions. But what about the great number of people living elsewhere? It might be thought perhaps that the better conditions for the first mentioned groups would automatically entail worse conditions for the others. This, for instance, seems to be the case in some European countries after the war, where some groups attained far better conditions at the expense of others, due to a change in national policy. This comparison is wrong, however, because the better conditions for the groups in question in Brazil will be due to a higher total production. Moreover, the change in Brazil will never come abruptly. Only gradually will the intensified regions come into production, supposing it turned out that competition of the intensified zones made it unprofitable to produce certain products elsewhere. The policy of

the government to industrialize rural production in the far away regions will be of great help in this respect.

Apart from the aforegoing it seems that changes of importance bring more often less disturbances than theoretically was anticipated. Before the Dutch 'Zuiderzee' was changed into a fresh water lake of much smalled dimensions, there was a wide-spread sympathy for the fishermen, who, it was feared, would lose their means of subsistance. It proved finally that things could have gone worse: considerable quantities eels are caught nowadays where previously saltwater fishing was done. Likewise, when machinery began to take over the work which had previously been done by manual labour it was thought the labourer would suffer. However, mechanization proved to be one of the reasons why the labourer of today is living under far better conditions than his counterpart did a century ago. Stimulated production caused by mechanization made this possible.

Returning to the starting point it is anticipated, that the influence of thriving intensified rural zones will not affect other regions unfavourably. Changes in the choice of crops may take place outside the new regions, such as an increase in the production of fibruous and oil producing crops. Rubber production might be increased, and other possibilities might arise which cannot even be foreseen at this time. On the other hand, the influence on the big crops, such as coffee, rice and cotton is likely to be favourable. The farmers in the intensified regions will probably via a co-operative movement obtain better conditions to buy their necessities and to sell their products. This in turn will gradually influence the whole distribution system in a way which may prove favourable to all. An example may illustrate this point of view. About eighty years ago the rural producers in the Netherlands began to organize themselves into co-operative societies. These co-operatives were formed for an economic purpose. It was no longer thought that the co-operative movement would destroy the capitalistic system, as was thought in the first

half of the nineteenth century. The intention was to try to correct some of the excesses of capitalism. This aim was reached. Within some thirty years the country was covered with co-operatives and, when in 1900 the producers of potassium fertilizers united themselves in a syndicate in order to monopolize the trade, the smaller co-operatives banded together and instituted a co-operative trust which successfully counterbalanced the power of the potassium syndicate. The corrective influence the co-operative movement has had on trade in general is also remarkable. The merchants were forced to adjust their prices and to be content with moderate profits or they had to go out of business. The corrective influence the co-operative movement exerted, was not only confined to the members of the co-operatives, those who had not become members were also benefitted, since trade as a whole was affected.

In the same way, the marketing systems, which are likely to spring into existence in the intensified regions in Brazil, will probably have a favourable influence on the whole trade within the country, thus benefitting all rural producers.

Another problem for the producers outside the intensified zones might be that labour, attracted by the better conditions which are thought to exist in the intensified regions, might migrate, thus accentuating the already existing labour problem. This possibility should not be overestimated. In the intensified regions skilled labour will have the opportunity to attain better living conditions, unskilled labour, however, will not be needed in great numbers. An intensive rural enterprise cannot work with labourers who can only use the hoe as an implement, who know nothing of the use of fertilizers, who have no knowledge of hygienic milking, etc. Therefore, the influx of labourers in the new regions will consist largely of those who have already some skill, and of those who are eager to learn. It is likely that the last mentioned will be predominantly the younger people.

Apart from this, the absolute number of labourers in the new

regions will be comparatively low, as machinery will do much of the work which was formerly done in many man-hours. Moreover, the type of farm which is likely to predominate, will be such that the employer himself will also assist in the work.

In the beginning of this chapter, it has already been said that the urban population is likely to obtain important benefits by the concentration of rural production. The lowering of the costs of living, as far as food is concerned, is considered to be a direct result of the correcting influence the farmers will have on trade. As soon as the farmers and their organizations have the possibility to market their products freely, where, when and to whom they wish, the rôle played by the local trader will have to change. The monopolistic position occupied by the traders in foodstuff may be broken, and people should then be able to buy in free competition on an open market. Prices no longer dependent on speculative movements of small groups will react to real demand and real free supply. The government could take measures to guarantee free marketing and these measures could then be realized, since the producer would no longer be dependent on the intermediaries, either for transport or for credit.

It is not suggested that all this could be achieved easily and without struggle. It seems quite natural, indeed, that the relatively small but important groups of people who will thus lose opportunities to make very high profits, will do the utmost to maintain their position. The governments, on the other hand, are already taking measures to improve the distribution and marketing systems. It has been proposed to create Commodity Exchanges in cities of over 100,000 inhabitants. Price regulations are being controlled more closely, whilst the import policy has been changed so as to prevent shortages of several necessities, and facilities are to be granted to those importers who sell the goods with moderate profits.

It may be supposed that the government will continue this policy, as the President has already stated on several occasions

that one of his principal aims is to lower the costs of living.

Still one further possibility should be mentioned in this respect. Should it develop that the organizations of the farmers become so strong that they take the place of the former monopolists, nothing will have been won by the urban purchaser. This is not likely to occur so long as the freedom of marketing products does not become a privilege of one farmers' organization only, but will be kept open for any farmer or group of farmers. The diverging points of view and the diverging interests in the groups of rural producers – which are, in fact, much bigger than those in the class of merchants – will prevent any form of organization which would be strong enough to monopolize the sale of their products. As long as a fair competition between the sellers is possible, there will be no danger of unreasonable prices.

Supposing the increased production and the improved distribution are realized, the question of whether the country could compete on the world market with its products might be raised. This question is complicated since the position of the Brazilian rural products on the world market vary from year to year, depending largely on outside conditions beyond the control of the country itself.

In today's situation coffee alone accounts for more than 60% of the value of all exports (1950). As on the coffee market great price oscillations occur, Brazil's situation may be judged rather dangerous in this respect. The country is by far the biggest producer in the world, but it has not a monopolistic position.

The two other big export products – cotton and cocoa – are equally vulnerable as far as prices are concerned. Therefore, Brazil's international economic position would be strengthened by a wider range of exportable products.

Nobody will doubt, that technically it should be possible to augment Brazil's production of maize and manioc for instance by 10–20%. These two products are mentioned, because the

volumes of their production are the largest of all rural products in Brazil (except sugar cane). On the other hand, it is not possible to foretell if such a raise in production would be possible without higher consumer prices. This will depend largely on factors on which the rural producers have little influence, such as land prices, cost of fertilizers, labour and machinery, marketing organization, storage facilities, etc. The lower the afore mentioned costs and the better the other conditions, the bigger the chances will be for low consumer prices, and thus the stronger the position in meeting foreign competition.

It will be clear that no positive answer can be given to the question which was put a few lines above. It may not be judged impossible, however, that within a brief number of years Brazil could enter the world market with more products than it sells now, having prices which would be competitive. Presuming as an example that maize production is augmented by 15%, and that this quantity would be available for export, the yearly export surplus of this commodity would be the same as that of the U.S.A. in the years before the Second World War.

Until recently the afore mentioned question was not thought to be of major importance since it was considered a sound policy to free the country from the insecurities of buying and selling on foreign markets. The aim of self-sufficiency, particularly for manufactured goods, therefore largely prevailed. It seems that the opinion has changed considerably. The conviction is gaining ground that the country can only fully prosper when it takes an adequate place in international trade.

One of the outstanding consequences of the afore mentioned change in Brazil's rural configuration may indeed be a bigger range of products available for exportation.

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