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THE AGRICULTURAL ECONOMY OF NORTHEAST BRAZIL

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The purpose of this paper is to present some general considerations about the agricultural economy of the Brazilian northeast and to discuss some implications of the present situation. At first, you have a view of the northeast in the Brazilian socioeconomic situation and after the agricultural economic of Brazilian northeast.

The agricultural economy of  
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## THE AGRICULTURAL ECONOMY OF NORTHEAST BRAZIL

Geraldo Magela Calegar <sup>1/</sup>

### Introduction

With an area of 1,548,672 Km<sup>2</sup> and an estimated population of 35 million people in 1979, northeast Brazil represents one of the poorest regions in Latin America.

Many studies have been done about this region. Several policies have been conducted by the local developing agencies in order to improve the way of life. However what have been done is not enough yet to change the living standar of the local society.

Around 56% of the population lives in the rural area, and 40% of the domestic income comes from an underdeveloped and hazardous agriculture, wich is always subject to adverse climatic conditions.

The purpose of this paper is to present some general considerations about the agricultural economy of the Brazilian northeast and to discuss some implications of the present situation.

### The Northeast in The Brazilian Socio-Economic Situation

The northeast region is one of the five geographic areas in with Brazil is divided (Fig. 1). It is composed of nine States and the "Território de Fernando de Noronha", making up 18.2% of the national territory and 30.3% of the national population.

Table 1 shows some characteristics of the Northeastern States, as well as data on the northeast as a whole and on other regions of the country.

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Population - Demographic Density - 1970

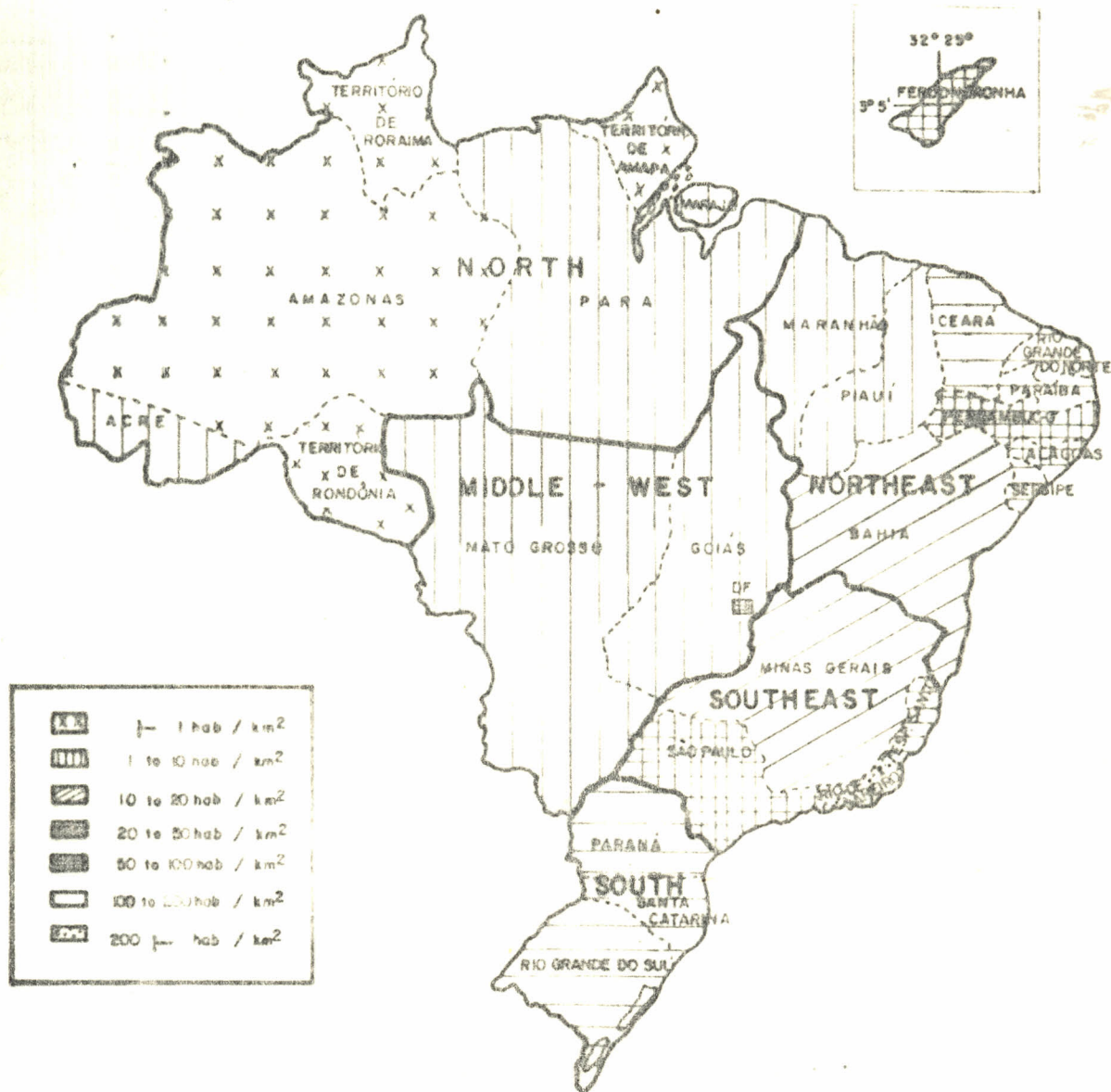


FIGURE 1

Table 1. Area, Population, and Demographic Density of States and of the territory of the Northeast and of the other Brazilian regions, 1970.

Regions	Area		Population		Density (people/Km <sup>2</sup> )
	Km <sup>2</sup>	% of the total	People	% of the total	
Maranhão	328,663	3.9	3,037,135	3.2	9.36
Piauí	253,548	2.9	1,734,865	1.8	6.91
Ceará	148,016	1.7	4,491,790	4.7	30.59
Rio Grande do Norte	53,015	0.6	1,611,606	1.7	30.40
Paraíba	56,372	0.7	2,445,419	2.6	43.48
Pernambuco	98,281	1.2	5,252,590	5.6	53.44
Alagoas	27,731	0.3	1,605,974	1.7	58.09
Fernando de Noronha	26	0.0	1,311	0.0	52.44
Sergipe	21,994	0.3	911,251	1.0	41.43
Bahia	561,026	6.6	7,583,140	8.0	13.54
NORTHEAST	1,548,672	18.2	28 675,081	30.3	18.59
SOUTHEAST	924,935	10.9	40 331,969	42.7	43.90
NORTH	3,581,180	42.0	3 650,750	3.9	1.03
SOUTH	577,723	6.8	16 683,551	17.6	23.68
MIDDLE WEST	1,879,455	22.1	5 167,203	5.5	2.75
BRAZIL	8,511,965	100.0	94 508,554	100.0	11.10

From: PAIVA (9)



Table 2 shows a comparison between some socio-economic indicators of the northeast and of the whole country. A brief analysis of table 2 shows that northeast Brazil is a poor area in relation to other parts of Brazil.

Considering the Brazilian economy as dualistic, the Northeast is a part of the Tradicional Branch supplying man power and raw material to the Modern Branch (southern part of the country) and serving as a market to the manufactured products from those regions. As a result, several problems arise, like emigrations, drastic losses of the value of the region products in comercial trades, capital evasion and, consequently reduced index of the investments in the region.

To break the vicious circle of underdevelopment, the Brazilian Government has sought the development of the northeast through Development Agencies (SUDENE, DNOCS, CODEVASF, CEPLAC) and Special Program (PROTERRA, PIN, POLONORDESTE, FINOR).

Besides all of this evolutionary effort, only now has the agricultural sector started to be awarded, specially with the Semi-Arid Programa (EMBRAPA, Projeto Sertanejo, PROPASTO, PROTERRA, PIN, POLONORDESTE, DNOCS and CODEVASF), and rural credits offered by the national banks (Banco do Brasil, Banco do Nordeste do Brasil and State Banks).

#### Land Distribution and Use

The northeast agrarian structure is based on a latifundiun-minifundium complex in every State but principally in some areas, like the "agreste"<sup>1/</sup>. This complex is probably the greatest responsible for the low income levels of the rural population as well as for the high index of unemployment.

A view of land distribution in the region is shown in Table 3. There are 579, 327 properties (about 58% of the total number) with up to 25 ha. These properties,

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<sup>1/</sup> According to MELO (7) "Agreste" is basically the region between the wet coast and the dry inland areas.

Table 2. Comparison between some socio-economic indicators of the northeast and of Brazil.

Specification	Brasil	Northeast
1. Area (1,000 Km <sup>2</sup> ) <sup>1/</sup>	8,511.6 100%	1,548.6 18.2%
2. Population <sup>1/</sup> , 1974 (1,000 inh.)	104,243.3 100%	31,260.6 30.0%
- Rural	42,721.5 100%	17,499.5 41.0%
- Urban	61,521.8 100%	13,761.1 22.4%
3. GDP Per capita, 1972 (US\$) <sup>2/</sup>	520.8 100%	254.7 48.9%
4. Energy production <sup>3/</sup> , 1971 (1000 kw)	12,473.0 100%	1,372.0 11.0%
5. Railway <sup>3/</sup> , 1971 (Km)	31,143.0 100%	7,288.0 23.4%
6. Roads <sup>3/</sup> , 1970 (Km)	1,216,079.0 100%	307,668.0 23.3%
7. Number of Tractors <sup>3/</sup> , 1970	156,592.0 100%	6,033.0 3.9%

From: 1/ BRASIL (1); 2/ BRASIL (3); 3/ PAIVA (9)

Table 3. Land distribution in northeast Brazil.

Class (in area ha)	Farms			Area		
	Absolute number	% of the total		Absolute value (ha)	% of the total	
		Simple	Accumulated		Simple	Accumulated
less than 1	17,349	1.74	1.74	11,435.6	0.01	0.01
1 to 2	55,578	5.59	7.30	74,328.1	0.99	0.10
2 to 5	148,354	14.85	22.15	479,518.1	0.56	0.56
5 to 10	142,495	14.26	36.41	1,007,868.2	1.17	1.83
10 to 25	215,551	21.58	57.99	3,464,293.0	4.03	5.86
25 to 50	147,234	14.74	72.73	5,167,884.2	6.01	11.87
50 to 100	115,859	11.59	84.33	7,961,478.2	9.25	21.12
100 to 200	77,015	7.71	92.04	10,359,568.4	12.04	33.16
200 to 500	52,303	5.24	97.28	15,682,518.6	18.23	51.39
500 to 1,000	16,363	1.64	98.92	11,009,405.6	12.80	64.19
1000 to 2,000	6,928	0.69	99.61	9,259,025.1	10.76	74.95
2000 to 5,000	3,002	0.30	99.91	8,820,186.2	10.25	85.20
5000 to 10,000	615	0.06	99.97	4,091,165.8	4.76	89.96
10000 to 20,000	181	0.02	99.99	2,375,188.0	2.76	92.72
20000 to 50,000	89	0.01	100.00	2,509,133.0	2.92	95.64
50000 to 100,000	16	0.00	100.00	1,098,147.6	1.27	96.91
over 100,000	15	0.00	100.00	2,659,135.8	3.09	100.00
TOTAL	998,948	100.00	-	86,030,279.5	100.00	-

From: BRASIL (2)



occupy only 5.86% of the total area. On the other hand, the properties beyond 200 ha represent about 8% of the total number, and 67% of the total area.

Table 4 shows the changes in land use from 1960 to 1975. The relative increase of pasture areas (5 times greater than with crops) requires a detailed analysis to define advantages and disadvantages, since replacement of agriculture by livestock causes reduction in the tributary budget and increases unemployment ( 4 ).

The main causes of these changes seem to be the governmental incentives, (principally by subsidizing interest tax) and the problems resulting from the establishment of the Rural Workmen Statute and Land Statute.

#### Man Power

The present rural population of the northeast is about 18.5 million people, or approximately 3.7 million families. Considering that each family offers a work power of 3 people/day, the total man power supply is of 11.1 million people/day. On the other hand, it is estimated that there is a deficit of 3.6 million jobs, what means that 1.2 million families, or 1/3 of the northeast population, is unemployed or underemployed.

However, this excess of man power does not express itself directly as unemployment. It is masked with temporary jobs, seasonal unemployment or, with underemployments of the owners of small farms, whose properties do not have work for all of the members of the family. Furthermore, the estimated supply excess is partially due to the female population and the young population from 10 to 14 years of age, included into the calculations, but that in fact only occasionally take part in the production process.

Considering the present level of expansion of the cultivated area and the population growth, probably, in a very near future, there will be no more available areas, and from then on, the increase of production will only be achieved through technological changes and increase in productivity. A recent



Table 4. Land use in northeast Brazil, 1960-1975.

Specification	1960		1975		Variations	
	Absolute area (1000 ha)	%	Absolute area (1000 ha)	%	Absolute area (1000 ha)	%
Annual crops	6,463	10.3	6,663	8.4	200	1.2
Perennial crops	2,266	3.6	3,952	5.0	1,686	10.0
Total Crops	8,729	13.9	10,615	13.4	1,886	11.2
Natural pastures	17,660	28.0	24,763	31.0	7,103	42.3
Artificial pastures	3,998	6.3	6,900	8.6	2,902	17.3
Total Pastures	21,658	34.3	31,663	39.6	10,005	59.6
Others	32,604	51.8	37,500	47.0	4,896	29.2
GREAT TOTAL	62,991	100.0	79,778	100.0	16,787	100.0

From: BRASIL (4)

paper by DORNAS (5) estimates that in 1995 the expansion of the agricultural frontiers will be possible only in the States of Maranhão, Piauí and Bahia.

#### Production, Productivity and Agricultural Technologies

Table 5 shows the principal crops grown in the northeast with their respective production, values, and participation in the total production value in 1972.

Basically, corn, beans, rice, cassava and cotton are cultivated all over the northeast. Sugar cane, cocoa and cotton are the principal crops for exportation.

Table 6 presents the productivity of some selected crops in each of the geographic regions of Brazil. Notice that corn and beans present productivities much lower than the national average, whereas banana presents productivity reasonably higher than the national average.

One of the main problems in dryland crops, as frequently occurs in the northeast, is related to the very uncertain climatic conditions, which should be considered as partially responsible for the low productivities.

Cattle raising in the northeast is characterized by an extensive system, deficient in modern techniques, except for restricted areas in the south of the region, or around large urban areas.

As shown in Table 7, the majority of the livestock population is represented by bovines. The bovine population increased approximately 29% from 1970 to 1975. During the same period, the total meat and milk productions also increased 29 and 36%, respectively, from 1970 to 1975.

Nevertheless, a deficit of meat and milk supply is yet present (78,000 tons of meat and 359,000 liters of milk), as shown in Table 8.

Table 5. Percentage of Participation of the Main Agricultural Products of the northeast in Relation to the Total Production Value, 1972.

Product	Unit.	Amount Produced	Production Value (1,000 US\$)	Relative Participation (%)
<b>Cereals</b>				
Rice	(t)	1,141,796	75,073.5	6.5
Corn	(t)	1,153,730	78,400.2	6.8
<b>Tuber and Roots</b>				
Cassava	(t)	12,975,791	181,172.9	13.2
Potato	(t)	21,436	2,092.8	0.3
Sweet Potato	(t)	517,302	14,800.1	1.3
<b>Beans</b>				
Common bean	(t)	150,657	13,202.4	10.4
Fava bean	(t)	108,560	16,635.5	1.0
Soybean	(t)	15	7.4	0.0
<b>Fruits</b>				
Lemon	(1,000 fr <sup>1/2</sup> )	291,370	1,884.2	0.2
Banana	(1,000 bn)	245,013	29,737.3	6.9
Orange	(1,000 fr)	1,815,705	19,906.9	1.7
Pineapple	(1,000 fr)	157,873	6,458.4	0.6
Avocado	(1,000 fr)	155,661	2,801.6	0.2
Mango	(1,000 fr)	1,654,019	13,068.6	1.2
Watermelon	(1,000 fr)	47,598	5,186.2	0.5
Melon	(1,000 fr)	1,582	217.6	0.0
Tangerine	(1,000 fr)	100,192	1,405.8	0.1
Grape	(t)	4,241	420.9	0.0
Cashew	(1,000 fr)	4,873,369	17,555.5	1.5
<b>Vegetables</b>				
Garlic	(t)	2,531	1,012.3	0.1
Onion	(t)	47,505	5,370.7	0.6
Black pepper	(t)	493	296.8	0.0
Tomato	(t)	159,203	12,576.8	1.1
<b>Oilseed</b>				
Peanut	(t)	9,038	1,068.6	0.1
Coconut	(1,000 fr)	631,149	24,831.8	3.0
Castorbean	(t)	234,125	38,255.2	3.3
<b>Fibers</b>				
Cotton	(t)	832,837	156,174.0	12.7
Sisal or Agave	(t)	205,605	32,143.5	2.8
<b>Other Crops</b>				
Sugar cane	(t)	31,065,027	152,941.7	13.5
Coffee	(t)	61,763	15,994.2	1.4
Tobacco	(t)	60,672	13,517.5	1.7
Cocoa	(t)	212,164	82,637.7	7.3
<b>TOTAL</b>			<b>1,143,682.61</b>	<b>100.0</b>

From: BRASIL (3)

<sup>1/2</sup> fr 1 fruit, bn 1 bunche and t 1 ton

Table 6. Average productivity of some selected products, 1976-1977.

Products	Productivity (kg/ha)					
	North	Northeast	South	South	West	Brazil
Food Crops						
- Rice	1285	1406	1158	2576	1151	1486
- Banana	14505	17232	10600	13949	8362	12817
- Beans	785	352	518	732	529	453
- Cassava	...	10697	15176	13914	...	12098
- Corn	1058	563	1668	2027	1699	1612
Raw material						
- Cotton	1090	235	1179	1379	1397	419
- Cocoa	296	549	327	...	...	594
- Sugar-cane	44736	45579	55522	44768	39620	50358

From: BRASIL (4)



Table 7. Northeast: Animal Population and Meat Production, 1970-75.

Animals	Population (1,000 heads)		Meat Production (t)	
	1970	1975	1970	1975
Bovines	13,805	17,888	193,656	250,933
Swines	7,095	9,460	22,633	30,177
Caprine	5,116	6,093	8,595	10,236
Ovines	4,144	5,289	8,247	10,525
TOTAL	-	-	233,131	301,871

From: BRASIL (4)

Table 8. Northeast: Balance between Supply and Demand of Bovine, Swine, Caprine, and Ovine Meat, and cow Milk, 1970-75.

Discription	Years	
	1970	1975
Meat (1,000 tons)		
- Production	233	302
- Apparent Consumption	300	380
DEFICIT	-67	-78
Milk "in natura" (1,000 l)		
- Production	820	1,118
- Apparent Consumption	1,156	1,477
DEFICIT	-336	-359

From: BRASIL (4)

Although the number of tractors has been reduced relatively to the national total from 1940 to 1970, the actual absolute number has increased continuously since 1920 (Table 9).

Concerning the per capita fertilizer consumption, apparently, there was an increase in the amount utilized in the northeast. This increase was, however, much lower than the national average, what can be deduced from Table 10. This situation should be associated with the climatic and market uncertainty, as proposed by MESQUITA (8) and DUARTE (6).

### Final Considerations

As briefly described, several different problems contribute to the underdevelopment of the Brazilian northeast.

The high climatic and market risks are responsible for the fact that, until now, only some crops can be advantageously produced in the northeast instead of in other parts of the country. Governmental incentives will be able to contribute to stimulate the development of the regional agriculture, as it has occurred with industrialization.

Although the agrarian structure and land use indicate high concentrations of land possessions in certain regions, it should be considered that fertile soil portions are scarce. This implies that an agrarian reform would not totally solve the present social problems.

The creation and/or adaptation and diffusion of new technology to the agricultural sector of areas characterized by adverse climatic conditions, unstable market and problems caused by frequent drought in the semi-arid region will still continue for a long time, even with the support that the northeast has received through the "Semi-Arid Program".

Table 9. Number of tractors in Brazil.

Regions	1920		1940		1940		1960		1970	
	No.	%	No.	%	No.	%	No.	%	No.	%
North	7	0.41	26	0.77	61	0.73	430	0.70	1,013	0.65
Northeast	72	4.22	250	7.40	451	5.38	3,131	5.11	6,033	3.85
Middle-West	2	0.12	28	0.83	139	1.66	2,194	3.58	9,449	6.03
Southeast	619	36.28	1,833	54.28	5,155	61.58	34,114	55.63	79,564	50.80
South	1,006	58.97	1,240	36.72	2,566	30.65	21,456	34.98	60,533	38.66
Total	1,706	100.00	3,377	100.00	8,372	100.00	61,325	100.00	156,592	100.00

From: PAIVA (9)



Table 10. Per capita Fertilizer Consumption in Brazil, 1950-72. (kg/inhabitant of each region).

Years	Regions <sup>1/</sup>			
	North	Central	South	Brazil
NITROGEN				
1950	-	-	-	0.27
1960	0.20	1.39	0.85	0.94
1970	1.87	3.07	4.70	2.92
1971	0.78	3.52	6.16	2.86
1972	0.99	5.29	3.39	3.57
PHOSPHORUS				
1950	-	-	-	0.98
1960	0.52	1.97	5.12	1.85
1970	0.99	4.58	14.88	4.40
1971	1.08	4.71	21.29	5.02
1972	1.34	6.40	29.45	7.03
POTASSIUM				
1950	-	-	-	0.45
1960	0.23	0.52	1.72	1.50
1970	0.31	3.90	7.50	3.24
1971	1.04	4.95	8.56	3.60
1972	1.29	5.27	11.31	4.53

From: PAIVA (9)

<sup>1/</sup> North: From Amazonas to Bahia (including northeast);

Central: São Paulo, Rio de Janeiro, Guanabara, Minas Gerais, Espírito Santo, Paraná, Mato Grosso and Goiás;

South: Santa Catarina and Rio Grande do Sul.

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